

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)  
REPORT FOR THE PROPOSED ELECTRIFIED STANDARD GAUGE  
RAILWAY SGR LINE PHASE II FROM TABORA TO KIGOMA 411  
KILIMETERS SIDING PASSING LOOPS ON AN ALIGNMENT  
PARALLEL TO THE EXISTING METER  
GAUGE RAILWAY MGR LINE**

**SUBMITTED TO:**

**NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)**

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## EXECUTIVE SUMMARY

### Introduction

The Government of Tanzania (GoT), through the Tanzanian Railways Corporation (TRC) under the Ministry of Works and Transport, has recently initiated the construction processes of the Standard Gauge Railway (SGR) Project within the country. This initiative is currently focused on Lot 6, which encompasses the Tabora-Kigoma railway line consisting of a main line stretching over 411 km, along with 95 km of siding/loops. The TRC, entrusted with managing railway projects on behalf of the government, is overseeing the development, implementation, and operation of this important infrastructure undertaking in Tanzania.

The aim of the SGR Project is to construct a modern standard gauge railway line along the Tabora-Kigoma route, improving transportation connectivity and fostering regional development. This involves the construction of new tracks, signaling systems, stations, and related facilities to meet the standards of a standard gauge railway. The objective is to enhance the efficiency, capacity, and reliability of the railway line, facilitating more effective movement of goods and passengers.

For the design and construction of the Tabora-Kigoma section of SGR Lot 6, the GoT has awarded a contract to the China Civil Engineering Construction Corporation (CCECC) in association with the China Railway Construction Corporation Limited (CRCC). The primary responsibilities of the CRCC within SGR Lot 6 include mobilizing necessary equipment and labor, designing and constructing the required infrastructure to meet client specifications, and adhering to relevant international standards for technical, environmental, and social considerations.

The involvement of CCECC and CRCC in the construction of SGR Lot 6 signifies a significant step toward realizing a modern railway network in Tanzania. The design and construction processes will prioritize client requirements and adhere to internationally recognized standards, encompassing technical excellence, environmental sustainability, and social responsibility.

In addition the government of Tanzania also appointed PAULSAM Geo- Engineering Limited (herein referred as PSG) to undertake an environmental regulatory process for the proposed construction of standard gauge railway line along the Tabora-Kigoma route.

The environmental regulatory process comprises an application for an Environmental Impact Assessment (EIA) Certificate. The application is being undertaken in accordance with the requirements of the Environmental Management Act, 2004 (No. 20 of 2004) (EMA) and procedures set out in the EIA and Audit Regulations, 2005 (G.N. No. 349 of 2005)<sup>1</sup> (hereinafter referred to as the EIA and Audit Regulations). The process is also being aligned to TRC's Environmental and Social Governance (ESG) policies which are underpinned by Good International Industry Practices (GIIP) such as the International Finance Corporation's Performance Standards on Environmental and Social Sustainability of January 2012 (IFC PS).

### Title and Location of the Project

The proposed SGR Lot 6 stretches between Tabora and Kigoma Regions, situated in the western part of Tanzania. The railway route originates from Tabora urban District and traverses through the following Districts: Uyui, Tabora urban, Urambo, Kaliua and Kigoma rural and ultimately concluding at Kigoma Urban. The entire route covers a distance of 411 km.

**Name of the Proponent/Developer and Contact**

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**Project Description**

The key infrastructure for the SGR line from Tabora to Kigoma will encompass a wide range of essential components. The primary elements of the project will include the construction of the standard gauge railway line/track, signalling and communication system, electrification and power supply, strategically positioned of bridges, culverts, underpasses, overpasses and viaducts to facilitate smooth passage over various obstacles and terrains.

Moreover, the development of access roads will be vital for efficient transportation of construction materials and accessibility to different construction sites along the route. The establishment of well-placed stations will cater to passenger boarding and disembarking, ensuring seamless travel experiences for commuters. Additionally, the project will encompass several supporting infrastructures such as construction campsites equipped with necessary facilities for workers and storage of equipment, maintenance facilities such as workshops, water management systems to ensure reliable water supply for various construction and operational activities.

The comprehensive nature of this project demands meticulous planning and execution to meet international environmental and social standards. Through responsible and sustainable development practices, the SGR line project will not only enhance transportation connectivity but also strive to safeguard the surrounding environment and communities.

**Relevant Policies, Legislation and Institutional Framework**

An overview of the national, sectoral, and international agreements, conventions, and treaties that regulate environmental and social issues pertaining to the planning and implementation of this Project is provided by the pertinent policies, legislation, and institutional framework.

The conventional railway project, like many construction projects, has a number of environmental effects that must be handled during the project's lifespan to preserve the environment's integrity.

Additionally, the project's promoter must make sure that the project complies with all applicable laws and/or policies governing environmental management. Before beginning the proposed project, it was necessary to ensure that it complied with all applicable laws, regulations, and agreements, including those relating to land, water, and other matters as well as municipal bylaws. Chapter 3 summarizes the pertinent legal frameworks that control environmental and social issues related to the project's development and implementation.

The study considered the different pertinent standards and directives that control the various facets of the project in addition to the policy and legislation. The standards of the "International Finance Corporation (IFC) guidelines," which are the "financial industry benchmark for determining, assessing, and managing social and environmental risk in project financing," were followed when this EIA study was conducted on a global scale.

## **Summary of the Prevailing Baseline Biophysical Environment**

### **Geology and climatic conditions**

The proposed railway line project will traverse through various topographical, geographic, soil, climate, hydrological, vegetation, and environmental features from Tabora and Kigoma. The classifications of these environmental characteristics are described broadly, focusing on the most distinctive and important aspects at the regional to district levels.

### **Kigoma Topographic Features**

The Kigoma area is a gently sloping plateau with high hills that rise abruptly from 800 meters at Lake Tanganyika's level to 1,750 meters to the east, dropping into gently rolling hills with three significant 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, Kigoma rural and Kigoma urban. 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.

### **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 25 degrees Celsius in December and January to 28 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.

Geologically the Kigoma region falls under the Manyovu red beds as a regional geological

#### **Tabora Climate and Topography**

Tabora Region has a tropical savanna climate with the Köppen climate classification of Aw. The total average annual precipitation in Western Tabora is 1010mm. While its 700mm or less in east Tabora towards the Singida border. The daily mean temperature is 23 degrees Celsius.

The specific Topography and climatic conditions along the proposed railway line;

#### **Kigoma 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.

#### **Tabora Geology and soil**

Tabora Region is located on the central plateau of at the latitude between 4 and 7 degrees south of the equator. Majority of the region's land area is between 1000m to 1500 m above sea-level. Tabora Region has an area of 76,151 square kilometres (29,402 sq mi), the region is slightly larger than the Central American country of Panama (75,417 square kilometres (29,119 sq mi)). Therefore, with its 76,151-square-kilometre (29,402 sq mi) size, Tabora Region is Tanzania's largest region by area.

Tabora Region is in the central-western part of the country. The highest point in Tabora Region is Wumbo peak at 1395m located in eastern Sikonge District. The most prominent mountain is Mount Kizuge located in northern Tabora in Nzega District.

The longest river in Tabora Region is the Ugalla River which feeds in to the lake Tanganyika drainage basin. Other major rivers in Tabora territory are the Malagarasi River which forms the western border with Kigoma Region, in the north is the Wembere River and in the north is the Gombe River. Another prominent river is the Manonga River which drains east into lake Eyasi in Arusha Region. However, most of rivers in Tabora dry up during the dry season. The

Malagarasi swamp is the largest Swamp in Tabora Region and one of the largest in Tanzania. Tabora borders a small eastern part of Lake Sagara.

### **Air Quality monitoring**

The SGR Lot 6 alignment crosses Tabora and Kigoma regions. Air quality of the Project Area is anticipated to be influenced by pollutants from existing stationary sources, fugitive /mobile sources, motorcycles, birds, insects, earth road, open burning, human activities and small combustion facilities. Existing stationary sources of air pollutants include small scale stone quarry and tobacco preparation and burning at Tabora.

Air quality monitoring was carried within the project area. During construction phase, Operation phase there will be significant environmental issues related to air quality management, particularly regarding dust emissions around the project area and pollutant gaseous.

During the construction phase and operation phase of SGR LOT 6 Tabora-Kigoma, the main expected sources of air quality impact can include:

- a) Dust and Particulate Matter: Mining activities, such as drilling, blasting, excavation, and transportation of sand and waste soil materials, can generate dust and particulate matter. These particles can become suspended in the air and cause air pollution, leading to respiratory issues and reduced air quality in the surrounding areas.
- b) Vehicle Emissions: The construction and operation phase of SGR Lot 6 will involve the use of heavy machinery, trucks, and other vehicles for transportation and material handling. The emissions from these vehicles, including exhaust gases containing pollutants such as nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), Carbon oxides (CO<sub>x</sub>), Ozone (O<sub>3</sub>) and particulate matter, can contribute to air pollution.
- c) Fugitive Emissions: Various processes in this project, such as ore crushing, grinding, and material handling, can result in fugitive emissions of dust and particulate matter. These emissions can occur from uncovered stockpiles, conveyor belts, and other equipment, especially if proper dust control measures are not in place.
- d) Fuel Combustion: During the operation phase, the use of diesel generators, boilers, and other equipment powered by fossil fuels can release pollutants into the air when the fuel is burned. Emissions from combustion, including carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>) and Volatile Organic Compound (VOC) can degrade air quality.

### **Noise and Vibrations**

The methodology outlines the procedures and methods used to collect and analyze data for establishing noise and vibration baseline. A Base line survey was conducted in the project area zone to collect levels of noise and vibrations baseline data on the locations. The sampling stations were established along the potential areas within the selected villages and measurements were taken according to Tanzania Environmental Noise and vibration regulations, 2015 and IFC guidelines.

### **Flora Characteristics**

The survey has identified a total number of vascular plant species 257 from 57 families. Out of that five species needs conservation concern includes IUCN Red listed 2 tree species *Pseudospondia microcarpa* and *Monanthes discolor* and two species falls in CITES, 111 timber tree species of *Pterocarpus angolensis* and *Pterocarpus tinctorius* while one tree species is purely endemic to floristic T4 *Acacia bullockii* respectively. The above species are all woody species of the tree life form.

In Kigoma region 52 useful plants species were identified and documented they include 42 medicinal, 5 timber and 5 wild foods. In Tabora region 23 useful plant species were identified and also documented, 15 medicinal 5 timber and 3 plants used as wild food. This reveals that the plant species occurring in the project area have a high diversity of uses ranging from medicinal, food, fuel building materials and animal food also.

#### **Vegetation categories in the study area.**

Vegetation is an integrator of environmental factors in that it reflects the climatic, physiographic, seraphic and biotic features pertaining to the land on which it grows. An understanding of the vegetation and plants of an area can therefore give good insights into the agricultural or biological potential of that area. Some land uses also depend directly on the vegetation resource and in this case an inventory of vegetation is obviously of great importance (Timberlake, Nobanda and Mapoure, 1993)

#### **Fauna Habitats**

The following key habitat types are represented by the flora habitats along the SGR alignment from Tabora to Kigoma: protected areas (game reserves, forest reserves, Ramsar sites), open space and designated wooded areas, wetlands/aquatic habitats, and agroecosystems. The subsections below address the significance of the important habitats in maintaining fauna species in the region. In particular, OS3-Biodiversity and Ecosystem Services, which are AfDB standards, were taken into account while identifying habitats. These environments are divided into two categories: "natural" habitats and "modified" habitats. This classification classifies all protected areas as natural habitats, while agro-pastoral land is categorized as a modified habitat.

#### **Stakeholder Engagement and Public Consultation**

Stakeholder engagement and public consultation conducted to identify key environmental and social issues and concerns regarding development of the proposed project. Stakeholders were mainly involved in providing key baseline and detailed information which was used to inform the ESIA report. Specifically, the stakeholder's issues, questions, concerns were taken into account during the Environmental and Social Impact Assessment study and helped to clarify key considerations related to potential social and economic aspects of the proposed project from local up to national level. The feedback and recommendations from stakeholders were obtained through review of documented information and a consultation process with affected stakeholders.

For the purpose of data collection, the stakeholder's engagement team made visits to the project site, ward and village headquarters, surrounding villages and the District council offices of Tabora and Kigoma municipal councils, Kigoma DC, Kaliua DC, Uyui DC, Urambo DC and Uvinza DC. During these visits, observations of community activities and settings vis-à-vis the

project area were made to establish the potential social and economic impacts of primary and secondary importance related to the project.

The key identified stakeholders and their specific areas of interests are listed in Table 5.1. This list was been updated throughout the different project phases to ensure that all key potential stakeholders are meaningfully consulted on a continuous and transparent basis, in order to enhance the implementation of project activities.

### **Assessment of Project Impacts**

The Project will result in environmental and socio-economic impacts (positive and negative) due to the nature of the proposed activities. The most significant potential impacts associated with the Project include benefits to the community through job opportunities, business opportunities, economic and physical displacement for construction of the project as well as disruption of movement patterns, potential influx into the area leading to inflation, alteration of the physical and chemical properties of soil resources and loss of topsoil through vegetation clearance.

### **Environmental Management Plan**

To manage the abovementioned impacts and other less severe impacts that were identified during the EIA process, an environmental and social management plan (ESMP) hereinafter referred to as Environmental Management Plan (EMP) has been developed that includes mitigation measures aimed at avoiding or limiting the consequence and probability of negative impacts. This includes the development and implementation of various measures and associated monitoring to ensure the effectiveness of implementation.

### **Environmental Monitoring Plan**

This section outlines the monitoring and reporting program to be implemented during the construction, operations, and post-closure phases of the project. The monitoring and reporting program have been developed on the basis of the Project activities that will be carried out, as per the potential impacts identified in the EIA. For accommodating the proposed Project, TRC will continue to monitor surface and groundwater, air quality and vibration on the existing monitoring locations as well incorporate additional proposed monitoring plans for respective specialists' report. Additional monitoring points will be added based on gap analysis as more information becomes available. The principal purpose of the monitoring and reporting program will be to provide information necessary to determine the projects operational and environmental performance within and around the proposed project areas.

### **Cost Benefit Analysis**

The cost-benefit analysis presents a brief comparison of environmental and social costs of implementing the proposed project versus benefits accrued from the project after completion. It is a clear fact that it is not possible to account for all the impacts accrued from the implementation of the project. Reasons for this is direct and indirect impacts, short and long term impacts, site specific and other cross project boundary impacts that will affect a much larger population, although it might not be significant. Evaluation of these impacts is more or



less dictated by the cultural and socio-economic characteristic of the surrounding environment to which the project has been subjected.

Therefore, the approach employed in this cost-benefit analysis will be based only on contrasting between the total amount of money that would be spent by the project in to the local community termed as “BENEFIT OF THE PROJECT” versus Opportunity cost of the items/issue the society will miss when the project is implemented plus environmental costs of mitigating any significant impact caused by project’s activities after its fully implemented to the closure phase termed as “COST OF THE PROJECT”.

The estimated investment cost for the proposed constructions of Tabora-Kigoma electrified Standard Gauge Railway project is about USD **2,216,210,871.75**. These cost will be undertaken by project proponent which, when combined with other environmental and social costs, will provide the costs of undertaking the proposed project.

### **Conclusion**

Changes to the baseline environment will occur as the project develops. The project will have an influence on the environment and society, with the physical and financial displacement of neighboring towns being the most significant. In order to discover new and/or major consequences that could have long-term, irreversible effects on the communities, the EMP must be followed, and monitoring of many environmental factors must proceed accordingly. When such affects are discovered, prompt action must be taken to implement the necessary safeguards.

## MUHTASARI TENDAJI

### Utangulizi

Serikali ya Tanzania kupitia Shirika la Reli la Tanzania (TRC) chini ya Wizara ya Kazi na Uchukuzi, hivi karibuni imeanzisha michakato ya ujenzi wa reli ya kiwango cha kawaida (SGR) ndani ya nchi. Mpango huu kwa sasa unalenga awamu ya 6, ambayo inazunguka reli ya kutoka Tabora mpaka Kigoma yenye urefu wa zaidi ya kilomita 411. TRC, iliyokabidhiwa kusimamia miradi ya reli kwa niaba ya serikali, inasimamia maendeleo, utekelezaji, na uendeshaji wa miundombinu hii muhimu nchini Tanzania.

Dhumuni la mradi wa SGR ni kujenga reli ya kisasa ili kuboresha uunganisho wa usafirishaji na kukuza maendeleo ya nchi kwa ujumla. Hii inajumuisha ujenzi wa miundo mbinu mipya. Lengo ni kuongeza ufanisi, uwezo na kuwezesha usafirishaji bora zaidi za bidhaa na abiria.

Kwa muundo na ujenzi wa sehemu ya Tabora-Kigoma ya SGR kwa awamu ya 6, serikari imetoa mkataba kwa Shirika la ujenzi wa Uhandisi wa Kiraia la China ( CCECC ) kwa kushirikiana na China Railway Corporation Limited ( CRCC ). Majukumu ya msingi ya CRCC ndani ya SGR awamu ya 6 ni pamoja na kuhakikisha upatikanaji wa vifaa muhimu na kazi, kubuni na kujenga miundombinu inayohitajika kukidhi maelengo ya serikari na kukidhi viwango vya kimataifa kwa kiufundi, mazingira, na mazingatio ya kijamii.

Kuhusika kwa CCECC na CRCC katika ujenzi wa SGR awamu ya 6 kunaashiria hatua muhimu ya kufikia mfumo wa kisasa wa reli nchini Tanzania.

Kwa kuongezea serikali ya Tanzania pia ilitoa kampuni ya PAULSAM Geo-Engineering Limited kufanya mchakato wa udhibiti wa mazingira kwa ujenzi uliopendekezwa wa reli ya kiwango cha kawaida ya kutoka Tabora mpaka Kigoma.

Mchakato wa udhibiti wa mazingira unajumuisha Tathmini ya Athari za Mazingira (EIA). Tathmini hii imefanywa kwa kuzingatia matakwa ya Sheria ya Usimamizi wa Mazingira, 2004 (EMA) na taratibu zake zilizowekwa katika kanuni za EIA na kaguzi ya mwaka 2005. Mchakato huo pia unaambatanishwa na sera za TRC za Mazingira na Jamii (ESG) ambazo zinaungwa mkono na sekta zingine za kimataifa kama vile Shirika la Fedha la Kimataifa.

### Maelezo ya Mwekezaji wa Mradi

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### **Maelezo ya Mradi**

Ujenzi huu wa reli awamu ya 6 utanzia Mkoa wa Tabora hadi Kigoma magharibi mwa Tanzania. Njia ya reli itapita Wilaya za Tabora mjini, Uyui, Urambo, Kaliua na Kigoma vijijini na hatimaye kuhitimisha huko Kigoma Mjini. Njia nzima ina takriban umbali wa kilomita 411. Ujenzi wa miundombinu ya reli kutoka Tabora hadi Kigoma itajumuisha vitu vya msingi vya mradi ikiwemo mfumo wa mawasiliano, umeme na madaraja.

Kwa kuongezea, mradi huu utajumuisha miundombinu kadhaa inayounga mkono kama kambi za ujenzi zilizo na vifaa muhimu kwa wafanyikazi na uhifadhi wa vifaa, vifaa vya matengenezo, mifumo ya maji ili kuhakikisha usambazaji wa maji wa kuaminika kwa shughuli mbali mbali za ujenzi na uendeshaji.

### **Sera na sheria zinazohusiana na Mradi**

Muhtasari wa makubaliano ya kitaifa, kisekta, na kimataifa na mikataba ambayo inasimamia maswala ya mazingira na kijamii hutolewa na sera zinazofaa, sheria, na mifumo ya taasisi mbalimbali.

Mradi huu wa reli, kama miradi mingine ya ujenzi, ina athari kadhaa za mazingira ambazo lazima zishughulikiwe wakati mradi ukiendelea ili kuhifadhi uadilifu wa mazingira.

Kwa kuongezea, mradi lazima uambatane na sheria zote zinazotumika na / au sera zinazosimamia usimamizi wa mazingira. Kabla ya kuanza mradi, ilikuwa ni lazima kuhakikisha kuwa sheria, kanuni, na makubaliano yote, pamoja na yale yanayohusiana na ardhi, maji, na mambo mengine na sheria za manispaa vinazingatiwa. Sura ya 3 inaelezea muhtasari wa mfumo unaofaa wa kisheria unaodhibiti maswala ya mazingira na kijamii yanayohusiana na maendeleo na utekelezaji wa mradi huo.

### **Ushirikishwaji wa Wadau na Maoni yao**

Ushirikishwaji wa wadau ulifanyika ili kubaini maswala muhimu ya mazingira na kijamii na wasiwasi kuhusu maendeleo ya mradi pendekezi. Wadau walihusika sana katika kutoa hoja za msingi na taarifa za kina ambazo zilitumika kukamilisha ripoti hii. Maswala ya wadau, wasiwasi vilizingatiwa wakati wa Tathmini hii na kusaidia kufafanua maswala na hoja mbalimbali zinazohusiana na mradi. Maoni na mapendekezo kutoka kwa wadau yalipatikana kupitia miukhtasari iliyoandikwa na wadau.

Kwa madhumuni ya ukusanyaji wa data, timu ya ushiriki ya wadau ilifanya ziara kwenye maeneo ya mradi, kata na vijiji vinavyozunguka pamoja na ofisi za Wilaya ya Tabora, halmashauri za manispaa ya Kigoma, Kigoma, Kaliua, Uyui, Urambo na Uvinza. Wakati wa ziara hizi, uchunguzi wa shughuli za jamii na mipangilio ya eneo la mradi ulifanywa ili

kutathmini athari za kijamii na kiuchumi zinazohusiana na mradi huu. Wadau muhimu walioshirikishwa wameorodheshwa kwenye Jedwali 5.1.

### **Tathmini ya Athari za Mradi**

Mradi huo utasababisha athari za mazingira na kijamii na kiuchumi (chanya na hasi) kwa sababu ya asili ya shughuli zilizopendekezwa. Athari muhimu zaidi zinazohusiana na Mradi ni pamoja na faida kwa jamii kupitia fursa za kazi, fursa za biashara, na Upotevu wa makazi ya asili kwa upande wa baadhi ya jamii ya mimea na wanyama.

### **Mpango wa Usimamizi wa Mazingira**

Ili kudhibiti athari zilizotajwa hapo juu na athari zingine hasi ambazo zilitambuliwa wakati wa mchakato wa EIA, mpango wa usimamizi wa mazingira na kijamii (ESMP) hapa unajulikana kama Mpango wa Usimamizi wa Mazingira (EMP) umeandaliwa ambao unajumuisha hatua za kupunguza zinazolenga kuepuka au kupunguza matokeo na uwezekano wa hizi athari. Hii ni pamoja na maendeleo na utekelezaji wa hatua mbalimbali na ufuatiliaji unaohusiana ili kuhakikisha ufanisi wa utekelezaji.

### **Mpango wa Ufuatiliaji wa Mazingira**

Sehemu hii inaelezea mpango wa ufuatiliaji na utoaji wa taarifa utakaotekelezwa wakati wa ujenzi, shughuli, na baada ya kufungwa kwa mradi pendekezwa. Programu ya ufuatiliaji na utoaji wa taarifa imeandaliwa kwa msingi wa shughuli za mradi ambazo zitafanywa, kulingana na athari zilizoweza kutambuliwa katika EIA. Mwekezaji ataendelea kufuatilia maji yaliopo juu na chini ya ardhi, ubora wa hewa na mitetemo kwenye maeneo ya ufuatiliaji yaliyopo pamoja na kuingiza mipango ya ziada ya ufuatiliaji wa ripoti ya wataalam husika. Maeneo za ziada ya ufuatiliaji yataongezwa kulingana na uchambuzi kadiri ya tafiti mbalimbali.

Programu ya ufuatiliaji na utoaji wa taarifa imeundwa kwa:

- Kuzingatia sheria, viwango na miongozo husika ya Tanzania; na
- Kuzingatia tararibu elekezi za kimataifa zinazohusiana na ufuatiliaji wa mazingira.

### **Faida Za Mradi**

Mchanganuo wa faida na gharama unafanyika kwa kulinganisha gharama zote ikiwemo za mazingira na kijamii dhidi ya faida zitakazopatikana kutoka kwa mradi huo baada ya kukamilika. Gharama inayokadiriwa ya uwekezaji kwa ujenzi uliopendekezwa wa mradi wa reli ya Tabora hadi Kigoma ni karibu dola 2,216,210,871.75. Gharama hizi zitatolewa na msimamizi wa mradi zikijumuishwa na gharama zingine za mazingira na kijamii.

### **Hitimisho**

Uendeshaji wa Mradi pendekezi utasababisha uhitaji wa marekebisho na usimamizi kwa mazingira na jamii. Mradi huo utazalisha athari za kimazingira na kijamii na kiuchumi, ambazo muhimu zaidi zinahusiana na kuhamishwa kwa wakazi na vyanzo vyao vya kiuchumi.

Mpango wa Ufuatiliaji wa Mazingira lazima uzingatiwe na ufuatiliaji wa mambo mbalimbali ya mazingira lazima uendelee ipasavyo ili kugundua athari mpya na / au kubwa ambazo

zinaweza kusababisha athari za muda mrefu, zisizoweza kurekebishwa. Pale ambapo athari hizo zinatambuliwa, hatua sahihi lazima zitekelezwe kwa w

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## ACRONYMS AND ABBREVIATIONS

Abbreviations or Acronyms	Meaning
AIDS	Acquired Immunodeficiency Syndrome
AQ	Air Quality
BOD	Biological oxygen demand
CCECC	China Civil Engineering Construction Corporation
CRCC	China Railway Construction Corporation Limited
CSR	Corporate Social Responsibility
dBA	Decibel
DC	District Commissioner
DAS	District Administrative Secretary
DED	District Executive Director
DoE	Division of Environment
EHS	Environmental, Health and Safety
EIA	Environmental Impacts Assessment
EIS	Environmental Impacts statement
EMA	National Environmental Management Act
EMP	Environmental management Plan
EPRP	Emergency Preparedness Response Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social impact assessment
ESMP	Environmental & Social Management Plan
ESS	Environmental and social standards
FAQ	Frequently Asked Question
FGD	Focus Group Discussion
GIS	Geographic Information System
GoT	Government of Tanzania
GPS	Geographical Positioning System
GST	Geological Survey of Tanzania

<b>Abbreviations or Acronyms</b>	<b>Meaning</b>
HIV	Human Immunodeficiency Virus
HSE	Health, Safety and Environment
IUCN	International Union for Conservation of Nature
IFC	International Finance Cooperation
M&E	Monitoring and Evaluation
NEMC	National Environmental Management council
NEP	National Environmental Policy
NGO	Non-Government Organisations
NM	Noise Monitoring
RESA	Rapid Environmental and Social Assessment
NOX	Nitrogen Oxide
OHS	Occupational Health and safety
OSHA	Occupational safety and Health authority
PAP	Potential Affected People
PaulSam	PaulSam Geo-Engineering Company Ltd
PM	Particulate Matter
PPE	Personal Protective Equipment
PPEs	Personal protective equipment
PPV	Peak Particle Velocity
RAP	Resettlement Action Plan
RUWASA	Rural Water Supply and Sanitation Agency
SGR	Standard Gauge Railway
SLM	Sound Level Meter
SOX	Sulphur Oxide
STDs	Sexually Transmitted Diseases
STI	Sexual Transmitted Infection
TASAF	Tanzanian Social Action Fund
TANESCO	Tanzania electrical Supply Company

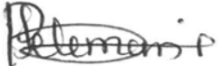

<b>Abbreviations or Acronyms</b>	<b>Meaning</b>
TANROADS	Tanzania National Roads Agency
TARURA	Tanzania Rural and Urban Roads Agency
TAWA	Tanzania Wildlife Management Authority
TBS	Tanzania Bureau of Standards
TFS	Tanzania Forest Service
TRC	Tanzania Railways Corporation
TUWASA	Tabora Water and Sanitation Authority
TPA	Tanzania Port Authority
UTM	Universal Transverse Mercator
VEO	Village Executive Officer
VPO	Vice President Office
WDC	Ward Development Committee
WEO	Ward Executive Officer
WHO	World Health Organization



## DECLARATION

We hereby declare that ESIA Report study for the Electrified Standard Gauge Railway line LOT 6 Project located at Tabora Municipality, Urambo, Uyui, Kaliua in Tabora Region and Uvinza, Kigoma rural and Kigoma Urban in Kigoma Region under TRC was undertaken in July 2023. We also declare that the presented Report for the proposed Project, is our original work.

The below named registered experts, working under PaulSam Geo-Engineering Company Limited of Dar es Salaam undertook the study.

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Elisha Gwamaka	Civil Engineer	Involvement in Project Description
Vicent Shumbusho	Sociologist	Report review and compilation
Pau Mkonyi	Mining Engineer	Remote Sensing and GIS Expert

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## **1 PROJECT BACKGROUND**

### **1.1 INTRODUCTION**

The Government of Tanzania (GoT), through the Tanzania Railways Corporation (TRC) under the Ministry of Works, Transport and Communications, has recently initiated construction processes of the Standard Gauge Railway (SGR) Project within the country. This initiative is currently focused on Lot 6, which involves the Tabora-Kigoma railway line with the main line stretching over 411 km, along with 95 km of siding/loops. The TRC is entrusted with managing railway projects on behalf of the Government, oversees the development, implementation and operation of this important infrastructure undertaking in Tanzania.

The aim of the SGR Project is to construct a modern standard gauge railway line along the Tabora-Kigoma route, improving transportation connectivity and fostering regional development. This involves construction of new tracks, signaling systems, stations and related facilities to meet the quality of a standard gauge railway system. The objective is to enhance the efficiency, capacity and reliability of the railway line, facilitating more effective movement of goods and passengers in Tanzania and East Africa in general.

For design and construction of the Tabora-Kigoma section of SGR Lot 6, the GoT has awarded a contract to the China Civil Engineering Construction Corporation (CCECC) in association with the China Railway Construction Corporation Limited (CRCC). The primary responsibilities of the CRCC within SGR Lot 6 include mobilizing necessary equipment and labour, designing and constructing the required infrastructure to meet client specifications and adhering to relevant international standards for technical, environmental and social considerations.

The involvement of CCECC and CRCC in the construction of SGR Lot 6 indicates a significant step toward realizing a modern railway network in Tanzania. The design and construction processes will prioritize client requirements and adhere to internationally recognized standards, encompassing technical excellence, environmental sustainability and social responsibility.

Construction of the Tabora-Kigoma SGR Lot 6 demonstrates the government's commitment to enhance transportation infrastructure and driving economic growth in the region. It is expected that the newly constructed section of SGR line will not only improve connectivity between Tabora and Kigoma but also stimulate trade, facilitate investment and contribute to the overall development of Tanzania.

Hence, the proposed construction of the SGR Lot 6 shows a significant milestone in Tanzania's efforts to establish a modern electrified standard gauge railway line. The collaboration between TRC, CCECC, and CRCC underscores a collective approach for Chinese and Tanzanian Governments to deliver a state-of-the-art railway line that will promote regional development, trade and economic prosperity, while upholding environmental and social considerations.

The proposed SGR Lot 6 stretches between Tabora and Kigoma Regions, situated in the western part of Tanzania. The railway route originates from Tabora urban District and traverses through the following Districts: Uyui, Tabora urban, Urambo, Kaliua and Kigoma rural and ultimately concluding at Kigoma Urban. The entire route covers a distance of 411 km.

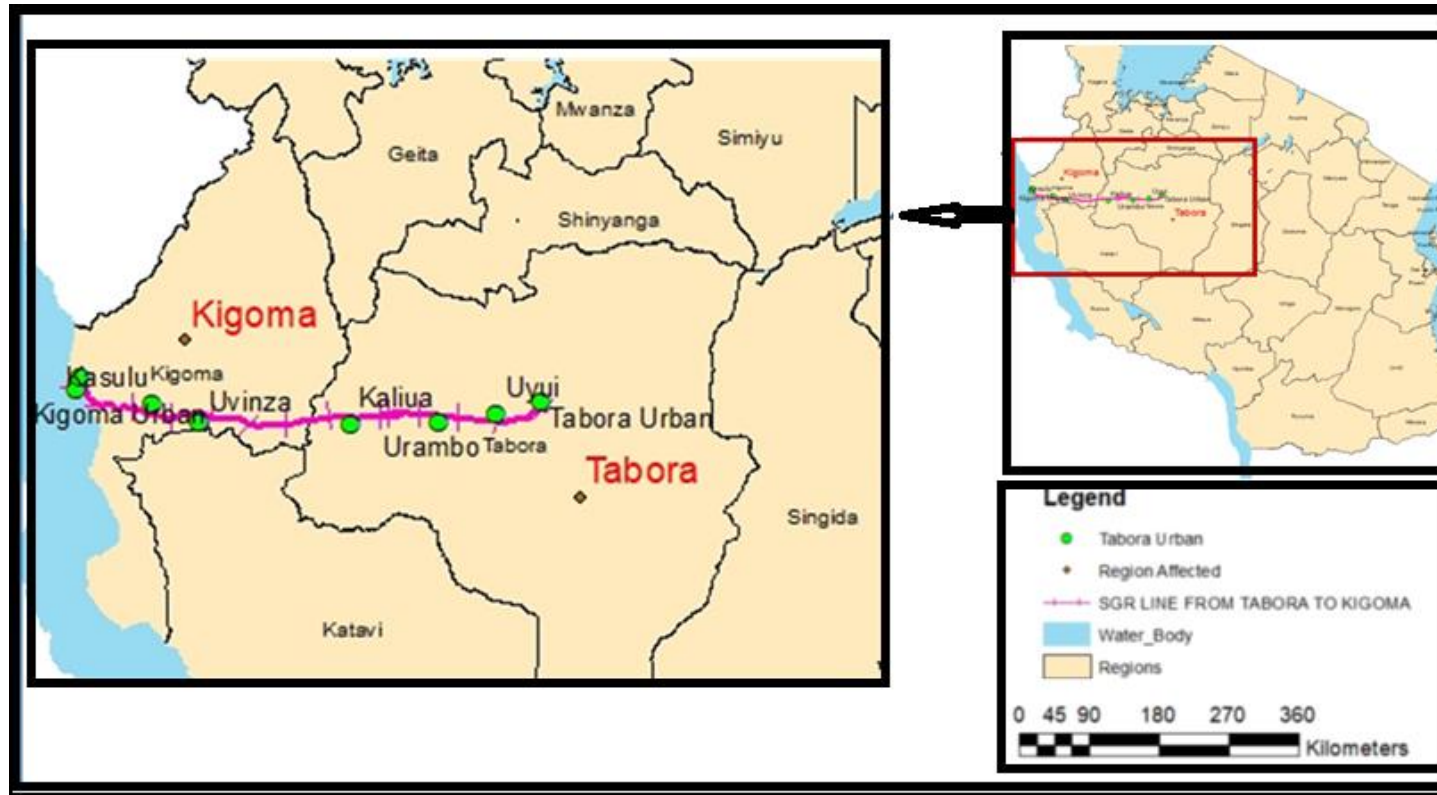


Figure 1-1: Regional Map Showing the traversing of the Standard Gauge Railway route.

## 1.2 THE NATURE OF THE PROJECT

The nature of the Standard Gauge Railway (SGR) project includes various facilities and structures that are essential for construction, operation and functionality of the new railway line. These facilities and structures are designed to ensure the smooth and efficient operation of the project. Here are some key elements:

- i. **Railway Tracks:** The SGR project involves laying down new standard gauge railway tracks along the entire route from Tabora to Kigoma. These tracks are wider and more robust than the existing narrow-gauge tracks, allowing for higher train speeds and increased carrying capacity;
- ii. **Stations:** The SGR project includes construction of railway stations at strategic locations along the route. These stations serve as key points for passenger boarding and disembarking as well as for loading and unloading of goods. The stations are equipped with amenities to cater for passenger needs, including waiting areas, ticketing counters and other facilities;
- iii. **Workshops:** Workshops will be established as part of the SGR project to provide maintenance, repair and servicing of the trains and railway infrastructure. These workshops will be equipped with specialized tools and equipment to handle routine maintenance and any necessary repairs;
- iv. **Marshalling Yard:** A marshalling yard will be constructed as a crucial facility for assembling, organizing and rearranging freight trains. This yard allows for the efficient sorting and grouping of cargo cars, optimizing the loading and unloading processes;
- v. **Maintenance Depots:** Maintenance depots will be set up to ensure the efficient management and upkeep of the rolling stock, locomotives and other railway equipment. These depots will play a vital role in the proper functioning of the railway system;
- vi. **Control Centers:** Advanced control centers will be established to monitor and manage train operations, track train movements and ensure safety and efficiency across the entire railway network;
- vii. **Sidings and Passing Loops:** To enhance operational efficiency, sidings and passing loops are constructed along the railway line. These allow trains to pass each other or temporarily park to let other trains pass, preventing delays and ensuring smooth train flow;
- viii. **Bridges and Viaducts:** The SGR project involves the construction of bridges and viaducts to facilitate the railway's crossing over rivers, valleys and other obstacles. These structures are designed to provide a stable and safe passage for trains;
- ix. **Tunnels:** In areas where cutting through hills or mountains is necessary, tunnels are constructed to allow the railway line to pass through challenging terrain. Tunnels provide an efficient and direct route for the trains;

- x. **Electrification System:** The SGR project is electrified, meaning it utilizes an overhead electrification system to power the trains. The electrification system supplies electric power to the trains, making them more environmentally friendly and energy-efficient;
- xi. **Signaling & Telecommunications:** Modern signaling and telecommunication systems are integrated into the SGR project to ensure safe and efficient train operations. These systems enable communication between trains and control centers, ensuring proper coordination and safety;
- xii. **IT Systems:** Information Technology (IT) systems are implemented to manage various aspects of the railway operation, including ticketing, scheduling and tracking of train movements;
- xiii. **Fencing:** To ensure safety and prevent unauthorized access to the railway line, fencing is installed along certain sections of the SGR route; and

The nature of the SGR project, including these facilities and structures, aims to create a modern, efficient and sustainable railway network that will support economic development, promote regional connectivity and provide safe and convenient transportation options for both passengers and freight.

### **1.3 PROJECT RATIONALE AND OBJECTIVES**

The main objective of this project is to promote sustainable transportation along the Tabora-Kigoma rail corridor, which includes the branch line between Kaliua and Uvinza, by constructing a new standard gauge railway line. The project aims to achieve several outcomes, namely:

- i. Enhancing connectivity with neighboring countries such as the Democratic Republic of Congo, Burundi, Uganda and the northwest of Tanzania. Additionally,
- ii. To increase the capacity of the railway line and improve train speed, leading to reduced travel time and costs for both passengers and goods; and
- iii. To enhance transport safety and environmental protection while ensuring interoperability with modernized railway standards through construction of a new standard gauge railway line;
- iv. The proposed railway line from Tabora to Kigoma will be seamlessly connected to the phase I of the project, the Dar es Salaam-Mwanza line, which is currently under construction;
- v. To accomplish the project, a Design and Build Contract will be employed, with a focus on ensuring the reliability, availability, maintainability and safety (RAMS) of the infrastructure and all systems involved. The design and construction process will adhere to both national and international guidelines concerning environmental and social safeguards;
- vi. The scope of work for the project involves the Design and Build of a new railway line, which includes various components such as Earthworks, Elevated Structures,

Culverts, Tunnels, Viaducts, Permanent ways, Stations, Buildings, Shops, line fencing, Signaling & Telecommunications, IT systems, and Electrification Systems for the standard gauge (1,435 mm) railway line stretching approximately 411 kilometers for the main line and 95 kilometers for Sidings/Passing Loops; and

- vii. By implementing this ambitious railway project, the region is set to experience improved transportation options, bolstering trade, and economic growth while preserving the environment and ensuring safety standards are met.

#### **1.4 JUSTIFICATION OF CARRYING OUT THE STUDY**

In accordance with the Environmental Management Act of 2004 and its regulations that was amended in 2018, any development project with potential detrimental impacts on the environment and the community must undergo an Environmental and Social Impact Assessment (ESIA) before implementation. Section 81 (2) of the Act specifies that the ESIA should be conducted prior to commencing the project or undertaking. Under the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018, the “First Schedule” classifies projects falling under Transport and Infrastructure development, specifically item 9c concerning the construction and/or expansion of existing railway lines, as Type A projects, mandating an ESIA study.

This ESIA study provides a comprehensive overview of various studies conducted, potential impacts of the proposed project, impact analysis and classification, proposed mitigation measures, management and monitoring plans, project cost-benefit analysis and preliminary closure strategies. The ESIA study adhered to the requirements of Tanzanian environmental legislation as well as the guidelines established by the African Development Bank. These guidelines serve as a framework for ensuring that development projects funded or supported by the African Development Bank follow best practices in environmental and social sustainability. By adhering to these guidelines, the ESIA study for the proposed Electrified Standard Gauge Railway line (Lot 6) from Tabora to Kigoma region demonstrates a commitment to responsible and sustainable infrastructure development that takes into account the potential impacts on the environment and local communities. This alignment with the African Development Bank guidelines helps to ensure that the project is carried out in an environmentally and socially responsible manner, promoting long-term benefits and minimizing negative effects on the ecosystem and society.

In ensuring compliance to these requirements, Tanzania Railway Corporation (TRC) has assigned PaulSam Geo-Engineering Company Limited (PaulSam) a registered Environmental consulting firm by NEMC to undertake the ESIA study for the proposed Electrified Standard Gauge Railway line (Lot 6) from Tabora to Kigoma region.

#### **1.5 ESIA OBJECTIVES**

The ESIA study aims to ensure that the EIA Process is participatory and all possible environmental and social impacts are identified and assessed with appropriate mitigation and



monitoring measures proposed. The study was a participatory process, involving a broad range of directly and indirectly affected stakeholders. Thus, the objectives of the study are to:

- i. Identify the main stakeholders that will be negatively or positively impacted by the Project;
- ii. Identify stakeholder's main concerns regarding the Project (through informed stakeholder consultation);
- iii. Describe the proposed Project activities and alternatives which have been considered thus far;
- iv. Describe the existing social, cultural, economic and environmental conditions within the Project area;
- v. Identify the potential impacts that may affect the existing environment, to ensure that social and environmental considerations are explicitly addressed and incorporated into the Project design and implementation process;
- vi. Identify a range of appropriate mitigation measures to avoid or minimise the potential impacts of the Project and to enhance the beneficial outcomes of the Project for the communities within the Project area;
- vii. Identify a range of monitoring measures to ensure the mitigation measures are implemented effectively;
- viii. Make an assessment of other Project alternatives and the justification for implementing the proposed project; and
- ix. Identify preliminary impacts which could arise from the proposed Project and determine an appropriate Terms of Reference (ToR) for the EIA Phase to further investigate and analysis of the impacts.

Upon approval of the Scoping Report and TOR, the consultant has undertaken a detailed investigation and analysis for preparation of the ESIA report for the application of the EIA Certificate. This ESIA study has been prepared in accordance with the requirements of the (Environmental Management Act (EMA), 2004 and the Environmental Impact Assessment and Audit Regulations, 2005 as amended in 2018.

## **1.6 SCOPE OF THE STUDY**

The main scope of this ESIA study for Lot 6 was to examine the potential environmental and social impacts of the proposed construction of Electrified Standard Gauge Railway line from Tabora to Kigoma region that cover a total of 411 km of the main line and 95 km of Siding/Passing loops with a width of 60 m. The study aimed to assess how the construction and operation of the railway project could affect the environment, local communities and socio-economic aspects in the project area. By conducting this examination, the ESIA study aimed to identify and analyse both positive and negative impacts, propose suitable mitigation measures and develop management and monitoring plans to ensure the project's sustainability and compliance with environmental regulations and guidelines.

Additionally, the study included a cost-benefit analysis to assess the economic, environmental, and social implications of the project. The ESIA study's overarching goal was to inform

decision-makers and stakeholders about the potential impacts and how best to manage and mitigate them while ensuring responsible and sustainable infrastructure development.

## **1.7 METHODOLOGY**

The methodology applied includes both qualitative and quantitative techniques in the collection of data including: interviews and review of existing data, transect walks, focus group discussion (FGD), consultation meetings, field measurements, site visit and observation. The methods used in conducting the socio-economic study and stakeholder engagement are detailed in subsequent sections while methods for specialist studies are elaborated in Chapter 4 of this report. Baseline study of the area involves air quality, noise level, socio economic survey, hydrological, hydrogeological studies and flora and fauna studies. The baseline data acquired through the following methods:

### **1.7.1 Baseline Study**

#### **1.7.1.1 *Reviewing of Existing Data***

Prior and during the study a detailed review of existing information available for the proposed SGR project were conducted. Information was obtained from the existing project documents such as RESA study which was undertaken in April 2023 and feasibility study for the proposed construction of the SGR project. Some of the information was obtained through consultation sessions with the TRC project team and available AFDB Best Practice Guideline documentation and literature review.

Other documentation obtained from various technical reports undertaken within the project area, local government offices etc are as follows:

- a) Preliminary Prefeasibility Study of the Project area conducted by Cowi;
- b) Rapid Environmental and Social Assessment (RESA) of the project area conducted by University of Dar es Salaam;
- c) Standard Gauge Railway Biodiversity Planning conducted by ERM and TAWIRI,2019;
- d) Baseline information on the bio-physical and socio-economic environment (focusing mainly on the proposed project's area of influence);
- e) Visual aids such as photographs and maps of the project area and its area of influence collected by the Company;
- f) Tabora and Kigoma Regional Profiles;
- g) Tabora, Uyui, Urambo, Kaliua, Uvinza and Kigoma District Socio-Economic Profiles;
- h) Various policies and legislative documents; and
- i) The National Population and Housing Census, 2022.

#### **1.7.1.2 *Key Informant Interview***

Key-informant interviews (KII) were conducted with the Village leadership, local community members and Institutions including: Ward Executive Officers (WEOs), Village Executive

Officers (VEOs), Head teachers, Ward Education Officer, health officers, famous elders, traditional leaders and healers, Livestock Officer, Ward Agricultural Extension officer, Community Development Officers and project affected persons (PAPs). The key informants were informed about the proposed Electrified SGR project on which they provided inputs based on their experiences in the Project area.

#### 1.7.1.3 *Focus Group Discussion*

Focus Group Discussions (FGDs) were held with the villagers, youths, local leaders and elder's representatives at village level. This was done to provide an opportunity for them to provide their views and ensuring their representativeness of the data gathered. FGDs were mostly involved on identifying community cohesiveness, traditional values system, access to social and economic services, income sources and the ways in which the proposed Project is perceived.

#### 1.7.1.4 *Consultation Meetings*

The consultation process involved multiple meetings with various regional and district offices, including Tabora and Kigoma regional offices as well as Tabora, Uyui, Urambo, Kaliua, Uvinza and Kigoma District Council offices. Additionally, discussions were conducted with different District experts. Moreover, several consultation meetings were organized within the local communities near the project areas. These meetings included the participation of Village Development Councils (VDC) and the general public.

The primary purpose of these meetings were to inform all stakeholders about the proposed construction of the SGR project. Through these open meetings and discussions, the consulted stakeholders had the opportunity to share their comments, concerns and issues pertaining to the proposed project. Each issue raised by individuals or groups underwent a meticulous examination and its relevance to the project was thoroughly assessed.

Chapter 5 of this report provides a comprehensive account of the stakeholder consultations and public participation, including the valuable comments, advice, and key issues of concern expressed during the process.

### 1.7.2 *Field Visit and Observation*

The field visit was conducted to understand the project site through boundaries of the RoW and assessment of the physical features such as flora and fauna, geology of the area, the existing landscape and main land uses within the project area. The site visits also enabled identification of the existing topography, soils, natural vegetation, crop cultivation, livestock keeping practices and human settlement patterns. It also helps to analyse the potential impact(s) within the proposed project area.

The specialists who visited the area included those for flora, fauna, air quality, hydrology, environment, civil engineering and socio-economic. The specialists visited the respective areas of the Project in fractural sites that would be affected by the project. They assessed the potential effects on the areas and their surroundings in relation to the proposed infrastructural sites. Consultations with both the experts on site and other stakeholders were also made accordingly.

Air quality results, surface and ground water sampling results were also undertaken as a way of recording the baseline data/information on those areas which will most likely be affected by the construction of the SGR line. In fact, all infrastructure including mainline, stations, workshops, marshalling yard etc that are placed within the infrastructural layout.

### **1.7.3 Stakeholders Engagement**

The Stakeholders Engagement (SE) approach is aimed at ensuring that the Project is in compliant with the National requirements listed in section 89 of the Environmental Management Act (EMA, 2004) and Regulation 17 of the Environmental Impact Assessment and Audit Regulations, 2005. The Act and corresponding Regulation outlines the key requirements for public consultation during the ESIA process. Among the techniques used to comply with the mentioned Act and Regulations requirements include:

#### **1.7.3.1 Identification of Stakeholders**

The identification of key stakeholders at local level was done in collaboration with the Proponent, local government and other organizations within the study area. In order to allow stakeholders to provide their views and concerns over risks, impacts and opportunities that might result from the proposed project. A total of 62 public meetings were held in the 65 Villages that would be affected by the project, spanning from Tabora to Kigoma region. The primary objectives of these meetings were to inform the community about the proposed SGR project, gather stakeholder's perspectives and identify significant issues that might be significant or require special attention during project design and implementation.

The invitation letters to the surrounding communities, local government authorities and government agencies were distributed by the consultant one week prior to the meetings. Meetings were confirmed through phone calls by different stakeholders before the meeting dates. The invitation letters served as initial communication tool that enabled stakeholders to be prepared for consultations on specific subject matters.

The meetings were conducted in Kiswahili and sometimes translated into local languages for more clarification. Particular attention was to ensure participation of women and marginalized groups to gather their views on the proposed project. All views and comments from different stakeholders were carefully noted and attendance registers of each meeting held were kept for reference. A summary of the significant issues of concern are summarized in Chapter 5 and attendance register with original signatures of consulted people recorded are attached as an Appendix to this report.

#### **1.7.3.2 Distribution of invitation letters**

#### **1.7.3.3 Stakeholders Consultations and Participation**

##### **a) Workshop**

Stakeholders meeting were held at the Regionals and Districts level, a proposed SGR project was presented through a power point presentation where specific issues were presented including the project background, description and boundaries, ESIA legislative requirements and authorisation process, specialists' studies and the proposed project implementation

schedule. Translation of the technical information was provided and people were encouraged to ask for clarity in case any part of the presentation was not clear.

b) One – on – one Consultation

One-on-one discussion was held during consultation with representatives from Government agencies and local institutions such as Tanzania Electricity Supply Company (TANESCO), Lake Tanganyika Water basin offices, Tanzania National Road Agency (TANROAD), Tanzania Rural and Urban Road Agency (TARURA), Tanzania National Park (TANAPA), Tanzania Wildlife Agency (TAWA), Tanzania Forest Agency (TFS), Occupational Safety and Health Authority (OSHA) and Fire and Rescue Force Offices, Tanzania Port Authority (TPA), Rural Water Supply and Sanitation Agency (RUWASA), Tanzania Social Action Fund (TASAF) and Community Development Watch (CODEWA). These stakeholders were consulted to understand their issues of concern and comments with regard to the proposed Project in their respective agencies/institutions. Participants were provided with opportunities to give feedback on the Project either verbally (with notes taken by the study team) or in writing (using email and postal submissions or feedback forms).

#### 1.7.4 Specialist Surveys

A specialized study was conducted to comprehensively cover key aspects of the project area including flora, fauna, hydrology, aquatic resources and cultural heritage. The primary objective was to obtain detailed baseline information of these components within the proposed SGR project corridor and surrounding areas. Additionally, the study aimed to assess the potential impacts that could be associated with the construction and operation of the project.

The specialized study involved in-depth investigations and data collection to understand the ecological and cultural characteristics of the region. It focused on documenting the diversity of plant and animal species, their habitats and their significance for conservation. The hydrology and aquatic resources were thoroughly examined to understand the water systems, potential impacts on water bodies and aquatic biodiversity.

Furthermore, the study delved into the cultural heritage aspects of the project area, aiming to identify and document any historical, archaeological or culturally significant sites that may be affected by the project.

##### 1.7.4.1 Flora Surveys

The survey utilized a qualitative method, where a car was employed to travel to all villages through the existing road network. Multiple stops were made during the journey to assess the surrounding vegetation and its associated plant species. The vegetation types were categorized based on their physiognomic characteristics.

The general identification of plant species was conducted directly in the field by a botanist, aided by various plant identification books such as Flora of Tropical East Africa (FTEA). For plant species that were challenging to identify in the field, specimens were collected, pressed and taken to the University of Dar es Salaam's herbarium for further identification and preservation for future reference.

To gather ethnobotanical information, interviews were conducted with local guides selected from each village who possessed knowledge of plants and their uses. A list of useful plants, including those used for food and medicinal purposes was compiled for each village. Field identification of each listed plant was then performed in the surrounding natural vegetation.

To ensure representation of different ethnic groups in the surveyed villages, interviewers were selected based on the variation of ethnic communities in each location.

For species classification and conservation assessments, two existing documents, the list Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora and the IUCN Red List of Threatened Plant Species were consulted. These documents were used to identify plant species falling within their respective categories and appendices.

During the survey, a digital camera was utilized to capture photographs for further illustrations and GPS technology was used to mark various important points, particularly locations where key plant species were identified and vegetation types were classified.

By utilizing this approach and employing various tools and resources, the survey was able to comprehensively document the flora and ethnobotanical information in the surveyed area, providing valuable data for future research, conservation and land management efforts.

#### 1.7.4.2 *Fauna Surveys*

The fauna identification was verified using field guides such as Stephen et al. (2006) and Spawls et al. (2002) for reptiles, Alden et al. (1995) and Kingdon (2007) for mammals and Schiötz (1999), Channing and Howell (2006) and Louis du Preez and Vincent Carruthers (2009) for amphibians. The species listings adhered to the Checklist of Tanzanian Species by Gideon et al. (2012).

The biodiversity (fauna) assessment followed a comprehensive approach that combined literature surveys and field surveys. A comprehensive biodiversity survey was conducted simultaneously within the project area to assess its impact on fauna components. Prior to the field surveys, a secondary data collection process was undertaken involving consultations with stakeholders, experts and relevant literature review.

The conducted surveys accounted for three main components:

- i. Comprehensive Fauna Survey: A thorough investigation of the present fauna in the study area was conducted, documenting different animal species and their distribution patterns;
- ii. Avifauna (Birds) Survey: A specific survey focused on the bird species found in the region, assessing their diversity and habitats; and
- iii. Aquatic (Freshwater Ecosystem) Survey: The survey extended to the aquatic environment, examining the freshwater ecosystem and its associated fauna.

To obtain a more holistic understanding of the project's impact, the surveys were complemented by the collection of qualitative and quantitative socio-economic information from the surrounding communities. Data was gathered through various methods include:

- i. **Key Informant Interviews:** Interviews were conducted with knowledgeable individuals, such as community leaders, local experts and stakeholders to gain valuable insights and traditional knowledge about the fauna in the area;
- ii. **Observational Methods:** Researchers made direct observations in the field to note the presence and behavior of different animal species and their interactions with the project area;
- iii. **Transect Works:** Transects were established to systematically sample and observe fauna in specific areas, providing standardized data across different locations; and
- iv. **Live Trapping:** Traps, such as box traps or funnel traps, were used to capture small mammals or other non-threatening species for identification and documentation.

By adopting this comprehensive approach, the fauna assessment was able to capture a wide range of information, based on both ecological and socio-economic aspects. The combination of field surveys and community engagement ensured a robust understanding of the fauna in the project area and aid in the development of effective conservation and mitigation measures.

#### 1.7.4.3 *Hydrology and Hydrogeological Surveys*

Conducting hydrology and hydrogeological data involved a systematic approach to understanding the water resources and groundwater characteristics in specific areas. This information is vital for various purposes, including water resource management, environmental impact assessment and sustainable development planning. In this study, various methods were carefully evaluated and selected based on specific activities conducted. The main activities involved in the methodology include literature review, data collection from both field surveys and relevant sources such as documents and institutional archives, data processing and data interpretation and analysis. The methodology for conducting hydrology and hydrogeological data typically included the following steps:

- i. **Literature Review:**
  - The initial step involved reviewing existing hydrological and hydrogeological data such as previous studies, reports and maps. This helps in understanding the regional hydrological context and identifying gaps in knowledge;
- ii. **Data Collection:** Field surveys were conducted to collect relevant hydrological and hydrogeological data. The data collected included flow rates, rainfall data, water quality parameters and geological characteristics;
- iii. **Geophysical Surveys:** Geophysical methods such as electrical resistivity, seismic surveys, and/or ground-penetrating radar were often employed to identify subsurface structures and potential groundwater-bearing formations;
- iv. **Meteorological Data:** Climate data, including precipitation and temperature were collected to understand the hydrological cycle and its influence on water resources;
- v. **Water Quality Sampling:** Water samples were collected from various sources to assess water quality parameters such as pH, dissolved oxygen, nutrients, heavy metals and pollutants; and

- vi. Data Analysis: Collected data was analyzed to understand hydrological patterns and surface water flow characteristics.

### 1.7.5 Assessment of Socio- Economic Impacts

The potential socio- economic impacts were analysed based on the issues of concern from consultations with stakeholders supplemented by site observations and analysis of the socio-economic information gathered. The issues can be categorised by sector as:

**i. Land and assets issues:**

It was reported from DED/DC Office that the project should ensure that compensation payments are done fairly and timely to all affected people before the project implemented. Also, clear demarcation of the plot boundaries particularly those near the project site should be identified to avoid future conflicts with neighbours. Cooperation with Village and District government to resolve any land tenure and land use conflicts which may arise due to competing political, social, economic and environmental interests should be emphasized;

**ii. Water issues:**

The existing water sources are not sufficient to meet the long-term requirements of the project once its demands are fully incorporated. The future water demand in the area is expected to increase beyond the current needs. Therefore, it is crucial to plan for alternative water sources to ensure a sustainable water supply for the project.

The primary source of water for the project will be from boreholes, which will be drilled at various sites along the railway corridor. These boreholes will provide a reliable water supply to support the project's needs. Additionally, the rivers that traverse near or adjacent to the railway corridor will serve as alternative water sources to supplement the project's water requirements. By utilizing both boreholes and nearby rivers, the project aims to ensure a stable and adequate water supply for its operations.

**iii. Environmental issues:**

- Pollution of land, water and air (due to different project activities including processing plant operations, dust from movement of vehicles/equipment etc) resources;
- Impacts of noise and vibration to local schools and settlements due to the heavy equipment and the trains;
- Vegetation clearance; reduced grazing and farming areas;
- Unstable slopes and increased potential for landslides; and
- Alteration to the distinct visual quality and topography of various sites (as referenced by community leaders).

**iv. Economic well-being:**



- Foster conducive environments for self-employment and increase opportunities for both seasonal and longer-term unskilled and medium skilled job opportunities within the project framework.
  - Most of the villagers expressed their concerns based on the experiences they had with other similar projects undertaken in Tanzania including some of the Tabora-Isaka SGR project within Tabora and Uyui Districts, which did not provide employment to the local community. Villagers requested the project proponent to consider providing employment to locals from their villages surrounding the project, particularly for non-skilled positions;
  - Promotion of a gender balance in employment, particularly for women, as women in Mwamila village, Uvinza district reported that they are currently not well integrated into the formal employment sectors.;
  - Consider and promote employment opportunities for all age categories;
  - Prioritise use of the local community labour force, especially youth and ensure that employment procedures and commitments are carried out through village or ward leadership;
  - Fully implement sustainable community development initiatives and infrastructure, including education and roads;
  - Foster infrastructure and economic activities that further improve market access of local farmers, i.e., improved roads, transport, access to communications and potential for finance opportunities;
  - Residents expect the new project will empower women and support initiatives such as selling vegetables, canteen workers, salon business, tailoring and employment affected villages particularly for non-skilled jobs;
  - Employment and training opportunities to local people in semi-skilled work to build capacity, facilitate skills' transfer, and improve employment access for locals;
  - More business opportunities for local groups in all villages surrounding the project corridor, such as boosting of local shops, farm produce, pharmacies and other local services;
  - Consider easy passage of human and livestock from both sides of the SGR fenced line especially within and close to affected village areas; and
  - Consider navigation from both sides of SGR line for vulnerable groups of people such as disabled and old persons as well as children.
- v. Negative Social Impacts:
- The influx of people attracted to the project and their intermingling with local communities could compromising security of the areas. Such interaction could increase HIV/AIDS and STD's infections and spread of many other communicable and non-communicable diseases, increased street children, increased marriage issues, increased degradation of cultural values and traditions of the indigenous local people, occurrence of child labour and engagement of pupils in petty trading and recreational activities; etc.

Positive Social Impacts: Contribution/improvement of social services in area, particularly roads, bridges, health facilities and services, schools, women/youth economic groups, etc. Additionally, villages through which the SGR line will pass shall have their economy improved due increased business between affected villages, wards, districts and region as a result of reduced travel time and easy of transport of business items and farm products using the SGR services.

## **1.8 STRUCTURE OF THE REPORT**

The structure of this EIS meets the requirements of the Environmental Impact Assessment and Audit Regulations, 2005. This report consists of twelve chapters, structured as follows:

- i. Chapter 1: Introduction of the project, providing the general background information of the proposed project;
- ii. Chapter 2: Provides the project background and description of the key activities that are anticipated to take place as part of the project;
- iii. Chapter 3: Presents all relevant legislation, regulations, policies and guidelines for project development and operations, which must be considered, as well as the administrative and legal framework pertinent to the project;
- iv. Chapter 4: Presents the baseline conditions of the existing biophysical and social economic characteristics of the project area;
- v. Chapter 5: Provides the manner in which the public participated and stakeholders were consulted to obtain their views on the project's development;
- vi. Chapter 6: Presents the assessment of impacts and identification of the project alternatives;
- vii. Chapter 7: Presents the proposed mitigation measures for the significant impacts identified;
- viii. Chapter 8: Presents the Environmental Management Plan (EMP) for the life time of the proposed project;
- ix. Chapter 9: Presents the Environmental Monitoring Plan;
- x. Chapter 10: Presents the Cost Benefit Analysis to show whether the proposed investment is worth investing in view of the negative impacts identified and the mitigation measures proposed;
- xi. Chapter 11: Presents the Decommissioning Plan after closure of the proposed SGR project; and
- xii. Chapter 12: Presents the EIA summary, conclusions and recommendations.

The report is also enclosed with all the references and appendices that had been referred or used in the document. The detailed specialist studies' summarized reports, survey forms and laboratory results are appended in this main report. The specialist studies include hydrology, hydrogeology, terrestrial flora and fauna, air quality, noise, soil, health impacts assessments, socio economic impact assessment and stakeholder engagement.

## 2 PROJECT BACKGROUND AND DESCRIPTION

### 2.1 DESCRIPTION OF THE PROJECT

#### 2.1.1 Project Location and Access

The project area for the Standard Gauge Railway (SGR) is located in the western part of Tanzania, covering the regions of Tabora and Kigoma. The railway line commences in Tabora and extends to Kigoma, traversing through seven District Councils, namely Tabora Urban, Uyui, Urambo, Kaliua, Uvinza, Kigoma rural and Kigoma Urban.

The proposed SGR route runs through diverse landscapes including fertile farmlands utilized both for seasonal and perennial crop cultivation. These agricultural lands play a crucial role in the local economy, contributing significantly to food production and livelihoods in the region.

The project area can be accessed through various transportation options. The route is accessible via Tarmac Roads and the ongoing construction of the Standard Gauge Railway or the existing meter gauge railway line from Dar es Salaam to Tabora. Additionally, an alternative route is through flight from Dar es Salaam to Mwanza, followed by a drive on tarmac roads to Tabora. Alternatively, travelers can opt for the convenience of the Standard Gauge Railway.

As the SGR project aims to enhance transportation connectivity and economic development in the region, comprehensive planning and coordination among relevant stakeholders are vital. Environmental assessments, community engagements and adherence to sustainable land use practices are crucial elements to ensure the project's success while preserving the ecological and social integrity of the area.

**Table 2-1: Districts, Wards and Villages traversed by SGR from Tabora to Kigoma**

S/N	REGION	DISTRICT	WARD	STREET/VILLAGE
1	Tabora	Tabora Municipal	Kalunde	Ulamba
2			Tumbi	Tumbi
3			Malolo	Malolo (Mtakuja)
4			Mbugani	usule
5			Kiloleni	Ghana
6			Kiloleni	Mtakuja
7			Kiloleni	Bomba Mzinga
8			Isevyu	Kazima
9			Mapambano	Msikiti
10			Mpela	Malabi
11	Tabora	Uyui	Mabama	Mabama
12			Usila	Ulimakafu
13			Ndono	Ndono
14			Ndono	Utemini
15			Ndono	Mpenge
16	Tabora	Urambo	Kapilula	Ulasa 'B'
17			Mchikichini	Isike
18			Ussoke	Usongelani

S/N	REGION	DISTRICT	WARD	STREET/VILLAGE
19			Ussoke	Ussoke
20			Usisya	Sipungu
21			Usisya	Usisya
22			Itundu	Mpigwa
23			Itundu	Itundu
24			Vumilia	Chekeleli
25			Vumilia	Motomoto
26			Vumilia	Vumilia
27			Vumilia	Uhuru
28			Kiyungi	Fundikila&Maswanya (Vitongoji)
29			Urambo	Kitega Uchumi Hamlet
30			Urambo	Kariakoo Hamlet
31			Urambo	Kalemela B
32			Ufukutwa	Ulindwanoni
33			Ufukutwa	Mtapenda
34			Utinge	Utinge
35			Utinge	Kombe
36	Tabora	Kaliua	Utinge	Ugansa
37			Kaliua	Mandela & Mwangaza (Kaliua Mashariki)
38			Kaliua	Kaliua Magharibi
39			Kazaroho	Imalamihayo
40			Nguruka	Nyangabo
41			Mganza	Malagarasi
42			Mganza	Mpetu
43			Uvinza	Tandala-Kitongoji
44			Uvinza	Ilunde-Kitongoji
45			Uvinza	Chakulu
46			Uvinza	Ruchugi
47	Kigoma	Uvinza	Uvinza	Lugufu-Kitongoji
48			Kandaga	Kalenge
49			Kandaga	Kandaga
50			Kazuramimba	Mwamila
51			Kazuramimba	Kazuramimba
52			Kaguruka	Bweru (Bweru Kusini)
53			Kaguruka	Reli Mpya
54			Simbo	Nyamoli
55			Simbo	Kasuku
56			Simbo	Machazo
57	Kigoma	Kigoma Rural	Simbo	Simbo
58			Mungonya	Kamara
59			Mungonya	Msimba
60			Mungonya	Kasaka B (Kitongoji)

S/N	REGION	DISTRICT	WARD	STREET/VILLAGE
61	Kigoma	Kigoma Urban	Kibirizi	Butunga
62			Kibirizi	Bushabani
63			Gungu	Kikungu
64			Kigoma Mjini	Lumumba

Source: Field Data July 2023

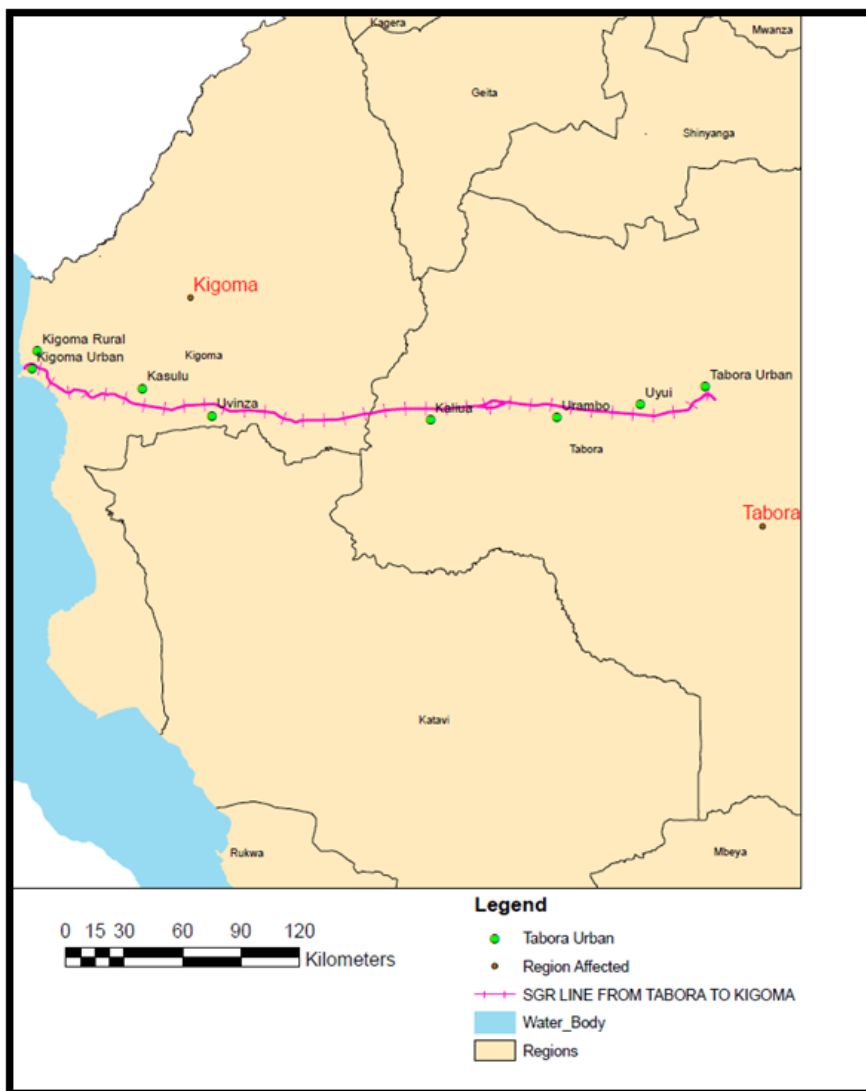


Figure 2-1: Location of the Tabora-Kigoma SGR Alignment

### 2.1.2 Route Description

The Standard Gauge Railway (SGR) route from Tabora to Kigoma will be constructed in a new alignment, running along-side the existing meter gauge route. This new route passes through diverse landscapes, with a significant portion being utilized as pasture and farmland for livestock grazing and crop cultivation activities respectively. In addition, the proposed route covers sensitive areas including forest reserves, wetlands, wildlife corridors, water sources, residential areas and critical economic infrastructure such as roads. Development of the SGR line in the two regions of Tabora and Kigoma is expected to open up vast land in the western side of Tanzania for potential development and economic growth.

In Kaliua District, the proposed SGR line traverses a crucial wildlife migratory corridor, connecting the Ugara River Game Reserve to the Mlowasi Game Reserves. The presence of the railway line may disrupt the natural movement patterns of wildlife that are accustomed to crossing through this corridor. Furthermore, the SGR route passes through the Igombe-Usagara Wildlife Management Area (ISAWIMA), which adds to the significance of its impact on the region's wildlife and natural ecosystems. Furthermore, the SGR line is situated in close proximity to Malagarasi-Myovozi RAMSAR sites. These sites are internationally recognized wetlands of significant ecological importance, providing habitat for diverse bird species and other wildlife.

The route is ecologically significant as it connects various protected areas including the Muyowozi-Kisigo Game and Ugalla Game Reserves as well as Ilunde and Masito Forest Reserves. This interconnectedness may allow for wildlife dispersal, benefiting significant populations of wildlife, including elephants, within the Moyowozi-Kisigo-Ugalla Ecosystem.

Some sections of the route exhibit intact miombo woodlands while others have been encroached by small patches of agriculture and settlements. Signs of wildlife, especially small mammals like hare and duiker are evident in certain areas. The dense miombo woodlands along the sand pit create a cool and moist environment suitable for non-flowering plant colonization.

## 2.2 PROJECT PHASES

Implementation of the proposed SGR project will involve four phases which include:

- i. Design and Mobilization;
- ii. Construction;
- iii. Operation; and
- iv. Decommission phases.

### 2.2.1 Design and Mobilization

Design of the proposed SGR line from Tabora to Kigoma is in progress. The TRC has awarded China Civil Engineering Construction Corporation (CCECC) in association with China Railway Construction Corporation Limited (CRCC) a contract to design and build the Tabora-Kigoma section of the SGR Lot 6. The CRCC's key tasks in the SGR Lot 6 include mobilization of the equipment and labour force, designing and building the required

infrastructure as per the clients' requirements whilst observing relevant technical, environmental and social international standards.

The Works comprise four designed elements namely main line, passenger stations, freight loading/unloading facilities and the marshalling yard and/or Workshop. These four elements should be linked together by an integrated design. Care must be taken in the design of other works not specifically part of the tasks, but having an effect on the Works such as Electrical, Water supply etc. The Detailed Design comprised preparation of detailed working drawings, project specifications and the appropriate documentation for construction purposes. Detailed design shall include, but not limited to the following:

- 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 municipalities and townships to avoid communities' separation;
- v. All Road Crossings specified in the Employer's Requirements are a minimum;
- vi. All road crossings' dimensions shall be designed to cater for Road Class for trunk road and for regional roads as a minimum. Road Classification is given in the Tanzania Ministry of Works and Communications Road Geometric Design Manual (RGDM);
- vii. All Trunk Road crossings dimensions shall be designed to cater for Road Class DC1 as given in the RGDM;
- viii. All road over rail crossings shall be provided with a wide enough opening to also allow passage and construction of service road;
- ix. Inlet 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 750 mm;
- 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 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 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 reproduction;
- xxi. Investigation as to the availability of construction materials and the testing of such materials obtained from the various sources;
- xxii. Centre-line soil surveys are to be done for the Works according to the Specification provided by TRC;
- xxiii. The Contractor is required to provide service manuals for all works;
- xxiv. Use of Building Information Modelling (BIM) for station buildings should be specified. The 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 work progress;
- xxv. The box bridges (which is culvert type) are 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;
- xxvii. Drilling and special field and laboratory tests should be according to requirements provided;
- xxviii. Stability investigations for fills and cuts;
- xxix. Foundation investigations for structures should be according to the Specification provided;
- xxx. The SCADA System shall be designed to monitor and control in the substations and sectioning equipment;
- xxxi. There should be Provision of an Electronic Wagon Weighing bridge (in motion) equipment/machines at freight facilities and marshalling yard;



- xxxii. If any archaeological or paleontological or suchlike remains are found during detail design, TRC must be notified; and
- xxxiii. All shifting or implementing of services shall be Contactor's responsibility and handled by means of Wayleaves for the purpose of setting out conditions, records and control. The Contractor should notify the service owners timeously to relocate their services and explain the Wayleave procedure.

**Figure 2-2: Design standard to be used for the railway line and yards of the SGR from Tabora-Kigoma**

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 : 00
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
Slope of ballast shoulder	1:1.5
Ballast volume	2.50 m <sup>3</sup> /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 Thermit (on site - turnout)
Main line turnouts	1:24 60 UIC tangential
siding turnouts	1:9 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 (Ea)	120 mm
A maximum cant deficiency (Eu)	75 mm
Fencing of railway corridor	Fencing of railway corridor shall be installed in both sides in urban and rural area.

Parameter	Design
Tamping method	Mechanised for the whole track including turnouts
Road, rail crossings	Grade separation
Gradient of Station	0 %o or 2 %o (under approval Engineer)

Source: TRC, Employer's Requirement, 2022 (TRC, 2022)

**Table 2-2: Functional requirement for railway design**

Parameter	Design
Railway type	Single track
Traction type	Electrification <ul style="list-style-type: none"> <li>• Catenary Nominal Voltage: 25KV AC</li> <li>• Traction Power Supply System: 2x25KV</li> <li>• SCADA System</li> </ul>
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	Marshalling and rolling stock maintenance facility shall be designed with considering future expansion. The contractor shall provide sufficient number of facilities to fully accommodate train operation plan. Includes the following: <ol style="list-style-type: none"> <li>i. Arrival lines for 2,000 m long trains;</li> <li>ii. Departure lines for 2,000 m long trains;</li> <li>iii. Run-around line for arrivals and departure lines;</li> <li>iv. Classification lines for 500 m long trains;</li> <li>v. Run-around line for classification;</li> <li>vi. Draw-out line for 1,000 m for shunting;</li> <li>vii. Wagon and Coach workshop lines;</li> <li>viii. Locomotive workshop lines;</li> <li>ix. EMU (Electric Multiple Unit) workshop lines (KATOSHO);</li> <li>x. Paint shop line;</li> <li>xi. Electrified test line of 1,000m (with fence). Test related equipment such as signal ATO/ATP, Balise shall be implemented for proper test;</li> <li>xii. Not-to-go spur lines of 400 m each;</li> </ol>

Parameter	Design
	xiii. Shunter lines of 80 m each;
	xiv. Sanding and refueling line;
	xv. Wash bay line;
	xvi. UFL line; and
	xvii. Connecting lines and turnouts.

Source: TRC, Employer's Requirement, 2022

The mobilization phase of the proposed construction of SGR line project will involve a series of activities that need to be carried out to prepare the site for the actual construction and operation of the electrified SGR line. Some of the activities involved during this phase include:

- i. **Vegetation clearing:** This involves the removal of all vegetation in the area where the railways route of 411km and 95 km siding loop will be constructed. This will create room for the construction of temporary and permanent structures;
- ii. **Site clearance:** This involves soil stripping to remove topsoil and create a level ground for the construction of temporary and permanent structures;
- iii. **Machinery and vehicle movement:** This involves the transportation of machinery and vehicles to the project site. Vehicles and machinery will be used to move equipment and materials around the site during the construction phase;
- iv. **Water bodies and fauna refuge areas:** The creation of water bodies and fauna refuge areas is crucial for the preservation of aquatic habitats and species in the area.
- v. **Tools storage facilities and construction camp:** These facilities will be established to store tools and equipment and to provide accommodation for construction workers;
- vi. **Sourcing of construction materials:** Construction materials such as gravel, stones, aggregates and sand will be sourced from the quarries identified around the project area along the line;
- vii. **Recruitment of mobilization workers:** Workers will be recruited to carry out activities during the mobilization phase;
- viii. **Placement and containment of solid wastes:** Solid and hazardous wastes generated from the operation area will be placed in designated areas to prevent environmental pollution;
- ix. **Rehabilitation/upgrading of access road:** The access road to the project sites will be rehabilitated and upgraded to ensure efficient transportation of materials and equipment; and
- x. **Demobilization of contractor and handover to client:** After completion of the mobilization phase, the contractor will demobilize and hand over the site to the client.

During the mobilization phase, there is potential for disturbances to the habitats of flora and fauna in the area. Construction activities such as main railway line, siding loops, marshalling yards, bridges and culverts, road construction may impact aquatic habitats and species.

In parallel with the preparation and construction activities, the client is actively seeking different permits that will pave the way for the smooth implementation of the project. These permits encompass a wide range of requirements such as the CRB permit, EIA Certificate, Borehole drilling permit, Fire and Rescue Force and OSHA Certificates among others. Acquiring these permits is essential to ensure compliance with regulatory guidelines and environmental standards throughout the project's lifecycle.

Equipment such as Bulldozer, excavators, dump trucks, light vehicles, cranes, portable toilets, portable offices, generators etc. Other equipment's are presented in the following list:

- i. Mobile Equip Light Utility 2WD Single Cab x8;
- ii. Mobile Equip Light Utility 4WD Dual Cab x6;
- iii. Mobile Equip Light Wagon 4WD x4;
- iv. Mobile Equip Light Fire Truck 2WD x1;
- v. Mobile Equip Heavy Skid Steer Loader Wheeled x2;
- vi. Mobile Equip Heavy Tray Back Truck Hiab 5T Single Cab x1;
- vii. Mobile Equip Heavy Forklift 3T x4;
- viii. Mobile Equip Heavy Bus 35 seats x2;
- ix. Mobile Equip Heavy Bus 65 seats x1;
- x. Mobile Equip Access Cranes Yard 15T x1;
- xi. Mobile Equip Access Hydraulic Rough Terrain 120T x1;
- xii. Mobile Equip Access Tele-handler x1;
- xiii. Mobile Equip Access Extendable Work Platform x1; and
- xiv. Loader Tool Carrier x1.

This list of equipment will be used for various activities during the mobilisation phase, such as vegetation clearing, soil stripping, construction of temporary and permanent structures, movement of vehicles and machinery, creation of water bodies and fauna refuge areas and sourcing and placement of construction materials. During the mobilization phase, it is anticipated that a total of approximately 600 workers will be recruited. The recruitment process will mainly target drivers for trucks and light vehicles, safety officers, procurement and logistic officers among other crucial staff required for the mobilization phase. Local content regulation during employment of labourers will be adhered to.

### **2.2.2 Construction Phase**

This section will consider the activities and associated impacts expected to be generated during construction of the Tabora-Kigoma SGR line and its associated infrastructure. The acquisition of land, change of land use and resettlement of people and their property is currently in progress. The phase will comprise the construction of the main railway line, electrical line

siding loops, stations, workshops, marshalling yard and all other associated infrastructures required to support the proposed railway line project including Permanent camp, Contractor's camp, etc.

The following is a list of Project activities that will take place during the construction phase of the Tabora-Kigoma SGR line:

i. Clearing and Grading:

Vegetation will be cleared and the land be graded to prepare the right-of-way for laying the railway tracks and construction of associated infrastructure;

ii. Earthworks:

Excavation, embankment construction and land leveling will be carried out to establish a stable foundation for the railway tracks and other structures;

iii. Track Laying:

The actual laying of the Standard Gauge Railway tracks will be a crucial part of the construction phase. This involves precise alignment, welding and securing the rails to the track bed;

iv. Bridges and Culverts:

Construction of bridges and culverts will be done to allow the railway line to cross rivers, streams and other obstacles along the route;

v. Stations and Terminals:

Construction of railway stations and terminals at strategic locations along the route will be essential for passenger and cargo handling;

vi. Railway Signalling and Communication:

Installation of signalling systems and communication networks to ensure safe and efficient train operations;

vii. Electrification and Power Supply:

Since the project is electrified SGR line, the construction of overhead power lines and substations will be undertaken;

viii. Maintenance Facilities:

Establishing maintenance facilities including depots and workshops to ensure the ongoing upkeep of the railway infrastructure and rolling stock;

ix. Viaducts:

A viaduct is a long bridge-like structure that spans across valleys, rivers or other low-lying areas will be constructed where necessary. Its construction consists of a series of spans or arches supported by pillars or columns. Viaducts are used to allow the railway line to pass over obstacles and provide a stable and elevated path for the trains. They are commonly employed in areas with steep terrain or water bodies;

x. Overpasses:

An overpass, also known as a flyover, is a structure that allows the railway line to cross over an existing road, highway or another railway line without interference. Overpasses are constructed to ensure smooth and uninterrupted flow of traffic both on the railway and the road/railway being crossed. They are particularly useful in urban areas where multiple transportation routes are intersected;

xi. Underpasses:

An underpass, also known as an underground passage or subway is a structure that allows the railway line to pass beneath existing roads, highways or other railway lines. Underpasses are utilized to avoid disruption of the flow of surface-level traffic and to enhance safety for both trains and road users. They are often used in urban areas or locations with restricted space;

xii. Construction of access roads:

Access roads will be constructed to provide easy transportation of supplies to the railway line and its supporting facilities. Construction of access roads may require crossing of rivers, bridges and culverts, which may impact aquatic habitats and species;

xiii. Sourcing of construction materials:

During the construction phase, various construction materials, including gravel, stones, aggregates and sand will be sourced from quarries located around the project area. Additionally, specific materials will be excavated from quarries established at different locations along the railway line. Moreover, borrow pits will also be established to extract the necessary construction materials. These measures ensure a steady and efficient supply of materials required for construction activities contributing to successful implementation of the project;

xiv. Recruitment of construction workers: Skilled and unskilled workers will be recruited for the construction phase of the project. Workers will be trained on safety procedures and regulations to ensure minimal environmental impacts from the project activities;

xv. Placement and containment of solid wastes:

Solid wastes generated during construction phase will be contained and disposed of in a safe and environmentally friendly manner;

xvi. Rehabilitation of access roads:

After the construction phase, the access roads will be rehabilitated to ensure minimal environmental impacts from the project activities;

xvii. Erection of a contractor's camp;

This will involve setting up temporary accommodation in different locations along the line from Tabora to Kigoma for the workers who will be involved in construction of the SGR line. The camp will be equipped with the necessary facilities such as sleeping quarters, kitchens, bathrooms and recreational areas to ensure that the workers are comfortable and able to carry

out their work efficiently. In addition to accommodation facilities, the contractor's camp will also include storage facilities for tools and equipment as well as offices for project management and administration. The camp will be designed to meet all the necessary health, safety and environmental standards to ensure the well-being of the workers and minimize any impact on the surrounding environment. Erection of the contractor's camp is a critical activity that will ensure the smooth running of construction phase and facilitate effective coordination and management of the project;

xviii. Water management system;

During the construction phase of the Tabora-Kigoma SGR line, various water bodies will be created to support construction activities and operation of the railway line, including stations, workshops and camps. Additionally, a reliable water supply will be necessary for activities such as dust suppression, machinery cooling, and general camp use. To ensure a sustainable approach, the project will implement a water management system that prioritizes water conservation and considers responsible use of this valuable resource throughout the construction process. This approach will help minimize water wastage, reduce environmental impacts and ensure a continuous and efficient water supply for various activities involved in the construction and operation of the SGR line;

xix. Heavy fabrication work including metal cutting (Gas cutting, welding):

Heavy fabrication work is a critical activity that involves the cutting and welding of metal components for various structures. This work requires specialized equipment, tools and personnel with the necessary skills and expertise;

xx. Construction of permanent camp:

The permanent camp will serve as the accommodation for the permanent staff who will be working for the SGR line once it becomes operational. The construction of the permanent camp will involve the erection of durable and comfortable housing units, such as apartments or dormitories that will meet the standards set by the company and regulatory authorities. The camp will also include essential facilities such as a kitchen, dining hall, recreational area and laundry facilities to cater for the basic needs of the employees. The camp will be designed to ensure the safety and wellbeing of the employees with adequate measures put in place to prevent accidents and minimize the risk of disease outbreaks. The camp will also be equipped with communication systems such as telephones and internet connectivity to enable the employees to communicate with their families and loved ones;

xxi. Contractor demobilization and handover; and

xxii. Establishment of domestic and waste water infrastructures.

The equipment that will be used during the construction phase of the SGR system includes:

- i. Earthmoving equipment such as excavators, bulldozers, graders and compactors for site preparation, excavation, grading and compaction works;

- ii. Concrete batching plants for the production of concrete required for construction of different structures;
- iii. Tower and mobile cranes for lifting and moving heavy construction materials;
- iv. Welding and cutting machines and other metalworking equipment for fabrication of steel structures and equipment;
- v. Piling machines for installation of foundation piles;
- vi. Asphalt pavers and rollers for construction of the access roads and parking areas;
- vii. Generators for power supply during the construction phase;
- viii. Water pumps for dewatering and water supply;
- ix. Material handling equipment such as forklifts, tele-handlers and trucks for transportation of construction materials;
- x. Surveying instruments for setting out the construction works and monitoring progress;
- xi. Tamping Machines: Used to compact and consolidate the ballast and trackbed for railway tracks;
- xii. Track Laying Machines: Specialized equipment used to lay and align railway tracks accurately;
- xiii. Ballast Regulators: Used for distributing and shaping ballast to ensure a stable track foundation;
- xiv. Drilling Rigs: Used for drilling holes for foundations, piling and other construction needs;
- xv. Concrete Pump Trucks: Used for pumping concrete to locations that are hard to reach with conventional methods;
- xvi. Vibratory Rollers: Used for compacting soil and asphalt layers to achieve proper density;
- xvii. Tunnelling Equipment: If tunnels are part of the project, tunnel boring machines and other tunnelling equipment will be used;
- xviii. Surveying Instruments: GPS devices, total stations and other surveying equipment are used for accurate measurement and alignment; and
- xix. Safety Equipment: Various safety equipment including personal protective gear, safety barriers and warning signs, are essential to ensure the safety of workers and the public.

During the construction phase, it is expected that a total of 720 skilled and unskilled workers will be recruited to work on the project. These workers will be sourced from the local community and surrounding areas with a focus on employing as many local workers as possible to promote economic development in the region. The recruitment process will be carried out in a transparent and fair manner with equal opportunities given to all applicants regardless of gender, ethnicity or religion. The workers will be required to undergo safety and health training to ensure compliance with the Occupational Safety and Health Administration (OSHA)



standards and to reduce the risk of accidents and injuries on site. In addition to the workers, the project will also employ various contractors and sub-contractors who will provide specialized services such as heavy machinery operation, electrical installation and plumbing. The equipment and machinery used during the construction phase will be carefully selected to ensure efficiency, safety and minimal environmental impact.

#### 2.2.2.1 *Source of Construction Materials*

Construction materials, including sand, aggregates, stones, and gravels, are vital for building various infrastructure components of the proposed SGR line project. These materials are required for constructing buildings, access roads, and foundations. The project's primary goal is to source these materials from nearby existing quarries, which were initially set up to supply materials for road upgrading projects. However, in some cases, new areas have been identified to serve as quarries and borrow pits along the proposed SGR line.

These newly identified sites are distributed along the SGR line, covering different areas from Tabora to Kigoma regions, including Tabora Municipal, Uyui, Urambo, Kaliua, Uvinza, and Kigoma districts (as shown in Figure 2.2). The specific projects and site descriptions have been assessed and summarized in Table 2.4.

**Borrow Sites/Areas:** Gravels and fill materials will be extracted from newly established borrow pits. Although the precise quantity of earth/fill material needed for the construction is not known yet, approximately five newly identified borrow areas with varying sizes have been located. The locations of these borrow areas are presented in the Table 2.4 and Figure 2.2.

**Quarry Sites/Areas:** For ballast, sub-ballast, and other civil works, hardstone will be required. One new quarry at Muungano village, Urambo District has been identified and earmarked for quarry site activities. To address potential dust, noise and vibration emissions associated with aggregate extraction and processing, this ESIA has collected baseline data on these aspects in all identified quarry sites. Proposed measures to control and mitigate dust emissions, noise emissions and vibrations to acceptable levels are included. Internationally recognized good practices will be applied, including restricting aggregate extraction and processing activities to the immediate vicinity.

The selection of these sites has been carefully done by the contractor, ensuring they meet construction requirements while adhering to acceptable International Environmental and Social safeguards. By utilizing existing quarries and newly identified sites, the project aims to effectively meet the demand for construction materials and minimize environmental impacts, following responsible and sustainable practices throughout the construction process.

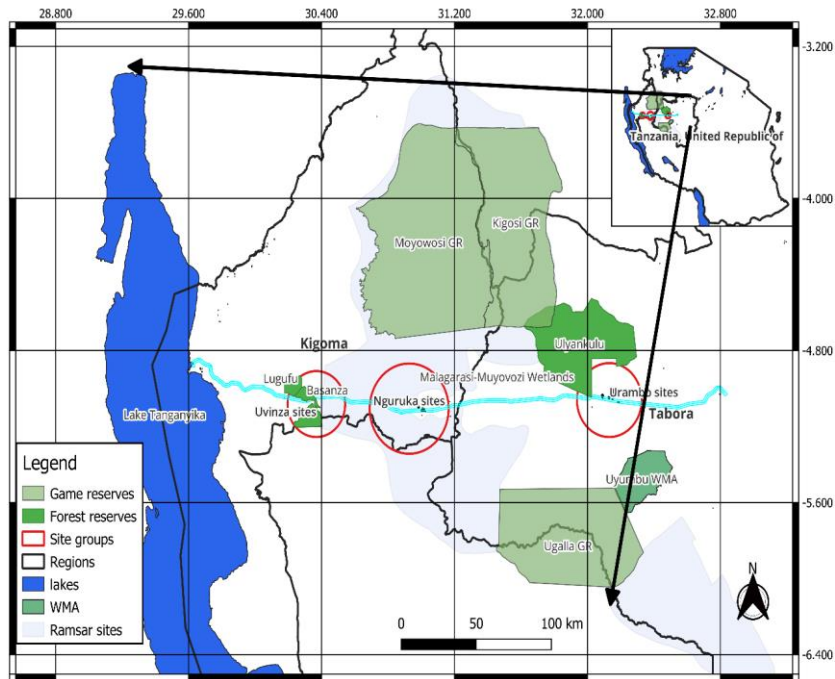
Comprehensive assessments of all proposed quarries and borrow pits have been conducted in this study and potential impacts will be assessed. Appropriate mitigation measures will be implemented to address any adverse effects that may arise from the establishment and operation of these sites in accordance with regulations and guidelines. This proactive approach demonstrates the project's commitment to environmental protection and adherence to regulatory requirements ensuring responsible and sustainable practices throughout the construction of the SGR line.

This comprehensive assessment and proactive approach demonstrate the project's commitment to environmental protection and adherence to regulatory requirements, ensuring responsible and sustainable practices throughout the construction of the SGR line.

**Table 2-3: Summarized components, size and relative location of quarry and borrow pits to SGR alignment**

Chainage	Coordinates	Type of facility	Location	Size (m2)
K 208+000		Borrow pit	Bweru	134,618
AK 283+000		Uvinza camp	Ruchugi	
AK88+600		Borrow pit	Ulasa B	300,000
AK83+100		Borrow pit	Ulasa B	230,000
AK76+500		Borrow pit	Mpigwa	300,000
K 234		Sand pit	Mpeta	51,006
AK 211 + 800		Sand pit	Itebula/Bweru	76,695
AK 87+300		Sand pit	Ulasa B	40,000
AK 211+600		Borrow pit	Bweru	155,829
AK 80+700		Quarry site	Muongano	400,000

Source: TRC design route 2023



**Figure 2-3: Project Quarry and Borrow Pit Facility Locations surveyed within SGR Lot 6 Alignment**

### 2.2.3 Operational Phase

During the operational phase of the SGR line, the following activities will take place:

- i. **Train Operations:** The primary activity during the operational phase is the regular operation of passenger and freight trains along the SGR line. Trains will run on scheduled routes, transporting passengers and cargo between different stations;
- ii. **Maintenance and Repairs:** Regular maintenance and repairs will be carried out on the railway tracks, train units and other operational facilities to ensure safe and efficient train operations. This includes track inspections, replacement of worn-out components and general upkeep of the railway infrastructure;
- iii. **Train Services:** Passenger services will be provided to accommodate travelers, offering various classes and amenities. Freight services will also be available for transporting goods and commodities;
- iv. **Station Operations:** Stations along the SGR line will be operational, providing services to passengers and cargo handling. Ticketing, boarding and disembarking procedures will be managed at these stations;

- v. **Safety and Security:** Ensuring the safety of passengers and cargo will be a critical activity during the operational phase. Security measures, emergency response plans and safety protocols will be strictly followed;
- vi. **Ticketing and Reservation:** Ticketing and reservation systems will be in place to facilitate the booking and purchase of train tickets by passengers;
- vii. **Customer Service:** Providing excellent customer service will be essential to meet the needs of passengers and cargo clients. This includes assistance with inquiries, feedback handling and addressing customer concerns;
- viii. **Cargo Handling:** Efficient cargo handling services will be provided to manage the loading, unloading and transportation of goods on freight trains;
- ix. **Train Crew and Staffing:** Train crew, station personnel and support staff will be employed and trained to ensure smooth operations;
- x. **Performance Monitoring:** Continuous monitoring and evaluation of train performance, schedule adherence, and service quality will be carried out to identify areas for improvement;
- xi. **Revenue Collection:** Revenue collection from ticket sales and freight services will be managed to sustain the operational costs of the SGR line; and
- xii. **Environmental and Social Monitoring:** Ongoing monitoring of the environmental and social impacts of train operations will be conducted and necessary measures will be taken to mitigate any adverse effects.

Overall, the operational phase of the SGR line aims to provide reliable, safe and efficient transportation services while maintaining environmental and social responsibilities. Estimated workforce during this phase is approximately 197 staffs.

#### **2.2.4 Decommissioning Phase**

The decommissioning phase of the SGR line project is a rare occurrence, but if necessary, it involves the systematic and responsible termination of the railway's operation and infrastructure. This phase is typically undertaken when the railway line is no longer economically viable, has reached the end of its useful life or when there is a need to repurpose the railway corridor for other purposes. The decommissioning process includes the following key activities:

- i. **Ceasing Train Operations:** During this phase, train services are gradually suspended, and the railway stops carrying passengers and cargo;
- ii. **Removal of Infrastructure:** Railway tracks, signaling systems, overhead power lines (if applicable) and other operational facilities are dismantled and removed. This process may involve heavy machinery and careful handling to ensure the safe removal of materials;
- iii. **Demolition of Buildings and Structures:** Station buildings, maintenance facilities, and other structures along the railway corridor are demolished and the land restored to its original condition or repurposed for other uses;

- iv. **Environmental Cleanup:** Environmental remediation is carried out to address any contamination or environmental impacts resulting from the railway's operation. This may include soil and water remediation and the removal of any hazardous materials;
- v. **Land Restoration:** The land previously occupied by the railway infrastructure is restored to its natural state or repurposed for other uses. This may involve reforestation, reclamation of agricultural land or conversion to other transportation or development projects;
- vi. **Safety and Security Measures:** Throughout the decommissioning process, safety and security measures are maintained to ensure public safety and prevent accidents or unauthorized access to the decommissioned railway corridor;
- vii. **Disposal of Materials:** Materials and equipment that are no longer needed are properly disposed of, recycled or sold, following environmental and regulatory guidelines;
- viii. **Legal and Financial Obligations:** Any legal and financial obligations related to the decommissioning of the railway line, such as contract termination, closure of permits and settlement of outstanding liabilities are addressed;
- ix. **Stakeholder Engagement:** Stakeholders, including local communities and relevant authorities, are informed and engaged throughout the decommissioning process. This may include public consultations and discussions on the future use of the railway corridor;
- x. **Documentation and Reporting:** Comprehensive documentation and reporting are prepared, detailing the decommissioning activities, environmental impacts and any mitigation measures undertaken; and
- xi. **Handover and Transition:** If the railway corridor is repurposed for other uses, a proper handover and transition process is implemented to ensure a smooth transfer of responsibility to the new project or entity.

Throughout the decommissioning process, safety measures are maintained and efforts are made to minimize any negative impacts on the environment and local communities. The goal is to ensure that the decommissioning is carried out responsibly and in accordance with applicable regulations and standards.

### **2.3 WASTE MANAGEMENT**

Wastes managed is done in line with the best environmental and health requirements with emphasis on the recycling. Avoiding generating such wastes may be difficult because they are often a result of various inputs into the system of a project. However, efficient management of these wastes can significantly reduce risks in the workplace and minimize expensive storage and disposal costs.

### 2.3.1 Solid Waste Management

Solid waste will be generated during various project phases, and therefore must be properly managed. Solid waste will be generated from several source areas of the facility including construction camps during the construction phase, railway stations and workshops during operations. The amount of solid waste to be generated at site during all phases are about 312 to 468 kg per day. The types of solid waste likely to be generated during operation phase will comprised of food remains, papers, boxes, plastic bags, bottles and empty cans. All waste generated during construction activities such as empty cement bags, wood scraps, glasses, plastic pipes, etc., will be collected at designated collection points.

Project phase	Waste Category	Waste generated	Management

It is a common standard that in strategic area waste bin storage facilities need to be placed. Rooms for specific waste separation depending on types will be provided for and containers for each type being color-coded.

### 2.3.2 Liquid waste management

The proposed project will also generate wastewater from toilets, floors and pavement washes water

The estimated quantities of liquid waste from domestic activities such toilets, floors and pavement wash are approximately 10ltr to 20ltr per person per day. The project will also produce waste water from sanitary facilities, kitchen or dining areas. The amount of wastewater to be generated is estimated to be in the region of 9000lts to 11000 lts per day for the facilities within 411km railway line. Waste water generated will be directed to the septic tanks and soak away pits to be constructed on site, treatment arrangements will be made in case the septic tanks are full so that they are properly emptied and discharged by specialized vehicles.

### 2.3.3 Hazardous waste

Among hazardous to be generated in the project site is scrap metals, syringe, spirits, expired medicines from first aid kit, defective tyres and batteries. There will be the recycling of scrap metals and used batteries for easily environmental management and control.

### 2.3.4 Electronic waste

E waste will be generated from solar array, offices, workshop, marshalling yard, workshops etc. Examples of electronic waste include, but not limited to: computer monitors, printers, scanners, keyboards, mice, cables, circuit boards, lamps, clocks, flashlight, phones, answering machines, digital/video cameras, radios, VCRs, DVD players, MP3 and CD players. The

generated waste will be stored in a special store for recycling or handled to an authorized dealer for disposal.

## **2.4 PROJECT INFRASTRUCTURE**

The key infrastructure for the SGR line from Tabora to Kigoma will encompass a wide range of essential components. The primary elements of the project will include the construction of the standard gauge railway line/track, signalling and communication system, electrification and power supply, strategically positioned bridges, culverts, underpasses, overpasses and viaducts to facilitate smooth passage over various obstacles and terrains.

Moreover, the development of access roads will be vital for efficient transportation of construction materials and accessibility to different construction sites along the route. The establishment of well-placed stations will cater to passenger boarding and disembarking, ensuring seamless travel experiences for commuters. Additionally, the project will encompass several supporting infrastructures such as construction campsites equipped with necessary facilities for workers and storage of equipment, maintenance facilities such as workshops, water management systems to ensure reliable water supply for various construction and operational activities.

The comprehensive nature of this project demands meticulous planning and execution to meet international environmental and social standards. Through responsible and sustainable development practices, the SGR line project will not only enhance transportation connectivity but also strive to safeguard the surrounding environment and communities.

### **2.4.1 Railway Line**

The proposed Tabora-Kigoma SGR line will have a dimension of 60 UIC as specified in the employer requirement document. The railway corridor width will cover the main alignment, and additional space will be allocated in certain areas for various purposes such as stations, workers' camps, marshalling yards, TPS/ATS facilities, sleeper production units, batch plants, quarry sites, borrow pits and access roads, depending on specific requirements.

The corridor will traverse through diverse landscapes, including remote areas with disturbed miombo woodland, agricultural lands, scattered settlements and public and private institutions. It is designed to accommodate the necessary infrastructure and facilities essential for the efficient operation of the standard gauge railway. The wider corridor size ensures sufficient space for construction and functioning of various components of the SGR line, contributing to improved connectivity and transportation in the region.

### **2.4.2 Bridges and Culverts**

#### **2.4.2.1 Culvert**

Based on the results of the flood risk assessment and hydrology of the area, box culverts have been designed beneath embankments as per employer specifications where natural watercourses occur or where required for drainage beneath the proposed SGR. As per the employer requirement a box culverts of lengths from 15m to 20m shall have minimum internal opening dimensions of 1.5m × 1.5m while a box culverts longer than 20m shall have minimum

internal opening dimensions of 2m x2m. These culverts will be constructed to also serve as animal crossing and passage of carts.

#### 2.4.2.2 *Bridges*

The construction of bridges is essential for the proposed SGR line as they allow the railway to cross over various natural obstacles like rivers, streams, valleys and challenging terrains that would otherwise be impassable. These bridges ensure a safe and efficient passage for the railway, maintaining connectivity and continuity of the track despite encountering natural barriers. The design includes different types of bridges based on the span of the river being crossed, categorized as super major bridge, major bridge and middle bridge size.

Moreover, viaducts may also be incorporated in sections where the SGR line passes through difficult terrains like deep valleys, steep slopes or flood-prone areas. By elevating the tracks, viaducts offer an effective solution, allowing the railway to pass over such obstacles without the need for extensive earthworks or land modifications.

The project's Environmental and Social Impact Assessment (ESIA) suggests the use of viaducts to provide a long-term solution for wildlife, especially elephants, by creating safe crossing sections identified as wildlife migratory corridors within the proposed SGR line.

A total of approximately 29 bridges have been designed along the Tabora to Kigoma route, each serving as a vital component in ensuring the successful implementation of the SGR line project (Table 2-4). These bridges and viaducts represent significant engineering achievements, facilitating smooth train operations and supporting ecological preservation while connecting distant regions and promoting socio-economic growth.

**Table 2-4: Bridge Type, Location and dimension for SGR line from Tabora to Kigoma**

S/N	Type	Chainage	Location	Length
1	Super Major bridge	AK2 + 056	Kazima	412
2	Middle bridge	AK8 + 910	Mtakuja	103
3	Middle bridge	AK36 + 620	Mabama	96
4	Middle bridge	AK52 + 440	Itinka	95
5	Middle bridge	AK75 + 620	Mpigwa	92
6	Middle bridge	AK93 + 740	Urambo magharibi	45
7	Middle bridge	AK127 + 600	Ulindwanoni	145
8	Middle bridge	AK126 + 049	Ulindwanoni	144
9	Middle bridge	AK161 + 730	Kombe	97
10	Middle bridge	AK186 + 650	Nyangabo	90
11	Middle bridge	AK238 + 079	Malagarasi	100
12	Middle bridge	AK259 + 361	Chakulu	142
13	Major Bridge	AK261 + 761	Chakulu	120



14	Middle bridge	AK282 + 123	Ruchungi	140
15	super Major bridge	AK292 + 747	Ruchungi	95
16	Middle bridge	AK304 + 740	Mwamila	170
17	Middle bridge	AK319 + 823	Kazuramimba	115
18	Middle bridge	AK332 + 190	Kalenge	110
19	Middle bridge	AK335 + 763	Kalenge	100
20	Major Bridge	AK344 + 143	Kandaga	402
21	Middle bridge	AK347 + 291	Kandaga	473
22	Middle bridge	AK351 + 571	Nyamoli	112
23	Super Major bridge	AK351 + 223	Nyamoli	197
24	Major Bridge	AK353 + 663	Nyamoli	112
25	Middle bridge	AK360 + 973	Kasuku	110
26	Major Bridge	AK363 + 023	Simbo	141
27	Middle bridge	AK366 + 058	Simbo	102
28	Major Bridge	AK371 + 223	Msimba	142
29	Middle bridge	AK375 + 923	Kikungu	1570

Source: TRC SGR Employer requirements

### 2.4.3 Underpass and Overpass

The proposed alignment for the SGR will intersect with various roads and areas that are used as livestock crossing points. According to the employer's specifications, a total of 65 road crossings will be constructed along the railway corridor. These crossings will either be in the form of underpasses or overpasses, depending on the specific location.

To ensure pedestrian safety, village centers will be equipped with pedestrian crossings at intervals of at least 400 meters. Moreover, there will be a provision for 20 animal crossings, which have been designed to facilitate the movement of wild animals by following natural and corridor studies.

It is essential that the design of livestock underpasses meets structural requirements to bear the weight of live and dead loads while also maintaining a sufficient gradient to allow proper drainage. These underpasses must be practical and easily accessible for the intended types of animals. Detailed plans and corresponding locations for all road crossings along the Tabora-Kigoma SGR line including underpasses and overpasses are listed in Tables 2-5 and 2-6 respectively.

**Table 2-5: Location of overpasses designed for Tabora-Kigoma SGR line**

S/N	Chainage	Coordinate		Location
1	AK15 + 545	468880.96	9442342.4	Mtakuja
2	AK20 + 070	465871.02	9439199.28	Tumbi
3	AK25 + 950	460029	9438531.84	Ilolagulu
4	AK28 + 640	457356.38	9438226.5	Ilolagulu
5	AK62 + 730	423583.42	9438475.38	Usisoke

S/N	Chainage	Coordinate		Location
6	AK232 + 960	256033.62	9436497.24	Mpeta
7	AK237 + 480	252066.68	9438306.14	Mpeta
8	AK276 + 260	214176.62	9441921.48	Chakulu
9	AK346 + 755	813420.89	9448444.4	Kandaga
10	AK373 + 715	793802.98	9463063.96	Butanga
11	AK373 + 785	793740.54	9463033.34	Butanga

**Table 2-6: Location of underpasses designed for Tabora-Kigoma SGR line**

S/N	Chainage	Coordinate		LOCATION
1	AK4 + 820	477557.9	9447475	Bomba Mzinga
2	AK5 + 310	477109	9447636	Bomba Mzinga
3	AK5 + 540	476888.7	9447678	Usule
4	AK7 + 600	475038.7	9447085	Usule
5	AK10 + 480	472955.4	9445146	Mtakuja
6	AK33 + 510	452665.3	9437022	Ulimkafu
7	AK33 + 680	452490.1	9436973	Ulimkafu
8	AK37 + 755	448469.2	9436364	Mabama
9	AK38 + 880	447348	9436459	Mabama
10	AK42 + 080	444159.4	9436729	Mabama
11	AK49 + 470	436795.8	9437352	Ndono
12	AK53 + 600	432690.8	9437751	Itinka
13	AK58 + 000	428305.8	9438114	Usongelani
14	AK59 + 500	426811.9	9438249	Usongelani
15	AK61 + 330	424978.1	9438353	usisoke
16	AK67 + 545	418791.5	9438922	Sipungu
17	AK71 + 250	415103.5	9439234	Usisya
18	AK76 + 895	409489	9439845	Mpigwa
19	AK83 + 340	402931.9	9440909	Ulassa B
20	AK88 + 255	398277.5	9441670	Urambo Mashariki
21	AK90 + 030	396529.2	9441954	Kalemale B
22	AK91 + 100	395472.6	9442121	KATANGA
23	AK96 + 600	390066.5	9441704	Chekeleni
24	AK97 + 240	389438.2	9441578	Chekeleni
25	AK119 + 880	367424.9	9440675	Kaliua Mashariki
26	AK121 + 020	366297.9	9440488	Kaliua Mashariki
27	AK124 + 610	362720.7	9440701	Ulindwanoni
28	AK139 + 060	348346.3	9440505	Mtapenda
29	AK149 + 660	337788.8	9439666	Kombe
30	AK150 + 440	337015.5	9439765	Kombe
31	AK173 + 250	314238.9	9439543	Ugansa

S/N	Chainage	Coordinate		LOCATION
32	AK173 + 870	313620.6	9439510	Ugansa
33	AK177 + 320	310230.5	9438903	Usinge
34	AK183 + 280	304389.9	9437718	Usinge
35	AK184 + 550	303142.3	9437465	Nyangabo
36	AK185 + 995	301705.7	9437349	Nyangabo
37	AK229 + 655	258972.3	9435040	Malagarasi
38	AK234 + 530	254831.1	9437509	Mpeta
39	AK235 + 205	254281.8	9437913	Mpeta
40	AK273 + 020	217379.4	9442137	Chakulu
41	AK297 + 020	193831.3	9440575	Ruchungi
42	AK304 + 590	186374.7	9441898	Mwamila
43	AK324 + 975	167423.9	9447488	Kazuramimba
44	AK325 + 365	832483.1	9447544	Kazuramimba
45	AK326 + 285	831570.9	9447668	Kazuramimba
46	AK336 + 175	823180.5	9448259	Kalenge
47	AK357 + 155	804653.5	9453604	Nyamoli
48	AK360 + 605	803122.7	9456707	Kasuku
49	AK363 + 685	802737.5	9459667	Simbo
50	AK367 + 065	799637.4	9460794	Msimba
51	AK368 + 065	798724.9	9461182	Msimba
52	AK368 + 865	798084.6	9461658	Msimba
53	AK372 + 285	795181	9463373	Butanga
54	AK375 + 205	792441.5	9462466	Kikungu

#### 2.4.4 Stations

The passenger station is located in the urban area so that user can access it easily. Considering the future of the railway and urban development planning in the area, the location should be selected considering the accessibility of the users and the connection with other means of transportation.

Railway station should be easily accessible from both sides on the road and should be designed so that the passage will be minimized. To enhance the convenience of the user, the horizontal and vertical movements should be minimized. If users need to move vertically, mobile facilities such as escalators and elevators will be installed.

Station square should be considered as function and role of traffic plaza. Its main facilities should be a transfer facility of car connected to station and parking facility. The layout of station square should not impede the expansion of railway facilities in the future and should consider the urban development plan of the area concerned.

**Table 2-7: Number of stations and their types**

Station name	Type and Area	
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Ilongulu		Passing loop
Mabama	Small -750 m2	Passenger
Usoke		Passing loop
Urambo	Medium -2500 m2	Passenger & Freight
Kaliua	Medium -2500 m2	Passenger & Freight
Kombe		Passing loop
Usinge	Small -750 m2	Passenger + Freight
Nguruka	Small -750 m2	Passenger
Malagarasi	Small 750 m2	Passenger
Ilunde		Passing loop
Uvinza	Medium- 6000 m2	Passenger + Marshalling yard +workshop
Lugufu		Passing loop
Kazuramimba	Small 750 m2	Passenger
Kalenge		Passing loop
Luiche	Small -750 m2	Passenger
Kigoma	Major -8000 m2	Passenger
Katosho		Freight facility +EMU

The passenger stations are classified into three categories: Major Stations, Medium Stations, and Small Stations (Table 2.8). Each category has specific minimum requirements to qualify for that category. The total indicative areas for all types of stations are approximated as follows:

- i. Major Station: The minimum station building area for a Major Station is 14,000 m<sup>2</sup>;
- ii. Medium Station: Medium Station buildings should have a minimum area of 9,500 m<sup>2</sup>; and
- iii. Small Station: For Small Stations, the minimum area required is 4,500 m<sup>2</sup>;

In addition to the station buildings, the total area for all platforms combined is expected to be 30,000m<sup>2</sup>. Freight buildings are estimated to have an area of 7,500 m<sup>2</sup>, while the concrete floor for freight hardstand should cover an area of 30,000 m<sup>2</sup>. These estimates provide a guideline for the different station categories and their respective sizes.

Table 2.9 displays the list of required areas for the building of both Major and Medium Stations. On the other hand, Table 2.10 outlines the list of areas necessary for buildings categorized as Small Stations. As these are unstaffed buildings, only public areas are included in the requirements.

**Table 2-8: Major and Medium Station list of areas**

Public areas	Staff areas	Support areas
Entrance Hall / Waiting Area / Concourse	Offices / Pantry	Mechanical / Electrical Room / Generator

Restaurant	Ticket Counter / ATVM (Automatic Ticketing Vending Machine)	UPS / Battery Room
Passageway / Platform	Police / Security Station	Telecommunications / Signal Room/ IT
Male Toilets	Employee Change / Locker Room / Shower Room	Storeroom
	Security CCTV Room	
Female Toilets	Male Toilets	Track maintenance Room
Mode Transfer and Parking	Female Toilets	Power / Scada Room
Elevator & Escalator / Information center	Operating control center	Elevated water tank
Commercial area / Lost and found		

Source: TRC Employer requirement 2023

### Public Areas

For the convenience of passengers, the following acceptable facilities by the Engineer should be installed in the passenger station. Required public areas include:

- i. **Entrance Hall:** The entrance hall serves as the gateway to the railway station and is included in the overall concourse and waiting room when calculating the size. It should embody the distinct characteristics and symbols of the railway station. Ample space must be ensured in this area, as it tends to experience a high concentration of passengers at once;
- ii. **Concourse:** The concourse acts as the central area where various pre-boarding activities take place, connecting the entrance and platforms. It facilitates tasks such as boarding preparation and information gathering. The distance between the concourse and platforms should be minimized for passenger convenience;
- iii. **Waiting Area:** The waiting area is a designated space where passengers can wait for their trains. It is separate from the main passenger passage line and designed with energy efficiency and maintenance reduction in mind;
- iv. **Passenger Passageway:** The passenger passageway provides quick access for passengers to board and disembark from trains. It is a straightforward and clearly marked pathway connecting the platform's main entrance with the concourse. The passageway should be designed to prevent slipping and ensure easy maintenance and durability;
- v. **Passenger Toilet:** Passenger toilets are located in the waiting area or concourse with separate sections for males, females and facilities for disabled individuals. Adequate provisions for cleaning tools will be available;

- vi. **Commercial Area:** Around the concourse and waiting area, commercial facilities like coffee shops, restaurants, bookstores and financial services can be established for passenger convenience. These commercial spaces should be planned and constructed separately without compromising the size of the concourse and waiting area;
- vii. **Elevator & Escalator:** Elevators and escalators are essential facilities to provide vertical movement access for disabled individuals, the elderly, children and others, leading to the waiting area, platform and commercial areas;
- viii. **Platform:** The platform's width should be appropriately calculated based on projected passenger demand and safety requirements. It will be equipped with a roof to protect passengers from weather conditions;
- ix. **Information Center:** The information center will be strategically located for easy passenger access without obstructing the movement of people within the station;
- x. **Lost and Found:** Major and medium stations will have a dedicated Lost and Found room and a system to manage lost items;
- xi. **Parking:** Major stations should offer comprehensive parking facilities with a parking lot management system, including a payment system;
- xii. **Security Scanner/Screening Machine:** Security scanners and screening machines must be provided at the entrance of all stations for passenger and luggage screening;
- xiii. **Staff Areas:** Ticket counters should be easily accessible to passengers and directly connected to the station staff office. An operating control center with a signal control panel should be installed;
- xiv. **Other Facilities:** Additional facilities may include the station master room, parcel room, storage area, pantry, staff toilet, lounge, shower room, Automatic Ticketing Vending Machine (ATVM) room, etc.; and
- xv. **Facilities for Maintenance:** Facilities for maintenance purposes such as the electrical room, telecom room, signal room, track maintenance room, power room, battery room, Scada room, LV panel room, generator room, fuel deposit, elevated water tank, and pump room should be provided.

#### Staff Areas

- i. **Ticket counter:** Ticket counter should be accessible to passengers and linked directly to the station staff office;
- ii. **Operating control center:** An operating control centre should be established, equipped with a signal control panel to oversee train operations efficiently; and
- iii. **Staff office:** The staff office serves as a central hub for managing various affairs, including sales, providing guidance to passengers, and overseeing train operations. If an operating control center is not installed separately, it will be integrated into the staff office.

Other facilities include: Station master room, parcel, storage, pantry, staff toilet, lounge, shower room, ATVM (Automatic Ticketing Vending Machine) room, etc.

For maintenance of facilities and equipment, the following facilities should be installed in the station. Electrical room, Telecom room, Signal room, Track maintenance room, Power room, Battery room, Scada room, LV panel room, Generator room, Fuel deposit, Elevated water tank, Pump room etc.

#### 2.4.5 Signalling Facilities.

The project will include safety signage and passing loops along the entire route. The safe control of trains entering and exiting railway stations and block sections will be achieved using three groups of railway operating equipment. Communication equipment will enable communication between the station controller, train drivers and station masters. Various systems will be employed to facilitate this, including the train dispatching system described under Telecommunications, radio and cab signalling. Additionally, block signalling systems will ensure train safety when trains are in a block section, while yard signalling systems will control the movement of trains into and out of stations safely.

#### 2.4.6 Livestock Crossing

Livestock underpasses for the SGR have been designed to be structurally capable of supporting the imposed live and dead loads while also ensuring adequate steepness to prevent drainage issues. The primary goal is to create underpasses that are practical and usable for specific types of animals they are intended for. All designed culverts adhere to the applicable standards and are in accordance with the employer's specifications, which are as follows:

- i. Structural Design: The structural design of the underpasses must adhere to AREMA (American Railway Engineering and Maintenance-of-Way Association) standards for "Concrete structures and foundations";
- ii. Drainage Design: If the livestock culvert also serves as a drainage culvert, the flooding frequency used in the hydraulic design should follow the Standard Specifications for Roadworks; and
- iii. Culvert Size: The size of the culvert is determined based on the number of livestock movements and the type of livestock, as specified in Table 2-12.

**Table 2-9: Typical size of livestock Culverts**

Equivalent livestock movements	Types of livestock	Size height x width (mm)	Type of construction
< 500 per day	Sheep, goats, cattle and donkeys	1800 x 1800	Prefabricated or in situ box culvert
		1730 x 1980	Prefabricated or in situ box culvert Fa
	Horses, mules and ostriches	2400 x 2400	Prefabricated or in situ box culvert
		1780 x 2340	Prefabricated or in situ box culvert

> 500 per day	Sheep, goats, cattle and donkeys	3700 x 2000	Cast in situ box culvert
	Horses, mules and ostriches	3700 x 2500	Cast in situ box culvert

#### 2.4.7 Drainage and ditches

The drainage system has been designed to accommodate the natural flow of water, taking into account safety, social and environmental considerations. Longitudinal drainage will be implemented along the length of the railway, especially in cuttings. Trapezoidal concrete-lined drains will be used, following the slope of the main line. The final sizing of the drains has been determined based on hydrological results.

Table drains will be constructed precisely to the specified dimensions and levels along the length of all cuttings on both sides of the formation. Catchwater drains will also be constructed according to the dimensions and levels specified in the employer's requirements.

Excavated material will be deposited on the low side of the drain to create a catchwater mound. In cases where the cross fall at right angles to the track does not exceed 1 in 6, and unless otherwise directed by the Engineer, a catchwater drain and mound will be formed by cutting at a slope of 1 in 3 against the natural slope.

#### 2.4.8 Supporting Infrastructure

##### 2.4.8.1 Passing loop/siding

A passing loop also known as a siding or a passing track, is a section of railway track that is constructed alongside the main line to allow trains to pass each other. Passing loops are essential for single-track railways, where there is only one track available for trains in both directions.

When two trains are traveling towards each other on a single-track railway, they cannot pass each other on the same track simultaneously. To enable safe passing, one train must move onto the passing loop while the other waits on the main line. Once the first train has cleared the passing loop, the second train can continue its journey on the main line.

Passing loops can vary in length and can be found at various points along the single-track railway. Longer passing loops can accommodate longer trains, while shorter ones are suitable for shorter trains. Passing loops are equipped with signals to control train movements, ensuring safe and efficient passing.

Passing loops play a crucial role in increasing the capacity and operational flexibility of single-track railways. They allow trains to pass each other without causing delays or disruptions to the train schedule. Additionally, they are especially important in areas with frequent train services, allowing for smoother and more efficient train operations.

As per the information provided by TRC, the proposed SGR line, lot 6 from Tabora to Kigoma, includes passing loops/sidings at specific locations. These passing loops/sidings are designed to be situated at Ilongangulu, Usoke, Kombe, Ilunde, Lugufu, and Kalenge. These strategic



points along the railway line allow trains to pass each other safely and efficiently, enhancing the overall capacity and operational flexibility of the railway system

#### 2.4.8.2 *Marshaling yard*

A marshaling yard, also known as a classification yard or shunting yard, is a specialized area within a railway system where freight trains are assembled, disassembled and sorted into various trains for their respective destinations. The marshaling yard is a crucial part of freight operations, allowing for efficient movement and organization of freight cars. It typically consists of multiple tracks and switch points that enable the rearrangement of train cars. This process is known as marshalling or classification.

However, in an electrified system, there are additional considerations for handling electric locomotives and ensuring the proper management of electrified train cars. The marshaling yard will have designated tracks and facilities for electric locomotives to connect to the overhead catenary system and receive electrical power.

Electric locomotives may have specific requirements for maintenance and handling, including charging or battery management. Therefore, the marshaling yard will have additional infrastructure to accommodate the electrified rolling stock's unique needs.

In the marshaling yard, trains arriving with various types of cargo are broken down into individual cars, and then these cars are grouped and organized based on their final destinations. Conversely, incoming cars from different origins are assembled into trains bound for specific destinations. The marshaling yard optimizes the handling of freight, making it easier to dispatch trains efficiently and improve the overall flow of goods along the railway network.

The marshaling yard for the Tabora-Kigoma SGR line is designated to be located in Uvinza District.

#### 2.4.8.3 *Workshop*

The workshop is a crucial facility in the SGR project serving as a maintenance and repair center for locomotives, train cars, and other railway equipment. It plays a pivotal role in ensuring the smooth operation and safety of the railway system. The workshop is equipped with specialized tools and equipment, skilled technicians and maintenance personnel to carry out routine inspections, repairs and overhauls of railway equipment. The workshop yard for the Tabora-Kigoma SGR line is designated to be in Uvinza District.

The workshop handles maintenance tasks ranging from minor repairs to major overhauls, ensuring that all rolling stock and machinery remain in optimal condition. Regular maintenance and inspections help prevent breakdowns, improve efficiency and extend the lifespan of the railway equipment thus reducing downtime and enhancing overall system reliability.

#### 2.4.8.4 *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 2,000 m 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.

#### 2.4.8.5 *Freight yards*

A freight yard is an integral part of a railroad station and encompasses a complex of equipment and structures for efficiently handling cargo. It involves receiving, loading, unloading and sorting of goods along with short-term storage. Depending on the volume and nature of freight flow a freight yard can be either general or specialized, accommodating specific types of cargo.

For all major and medium stations in the SGR project, freight yards have been meticulously designed. These freight facilities are equipped to handle long trains up to 2,000 meters in length. Each freight facility comprises one marshalling line, two loading lines and a not-to-go spur measuring 400 meters. Additionally, there are freight storage buildings, shed storage and a security control facility. The general layout of the freight yard is illustrated in Figure 2.3.

The SGR lot 6 from Tabora-Kigoma has designed freight facilities including shed type warehouses served by railroad lines, mechanized open shops for efficient handling of containers and other cargo. Additionally, it has trestle approaches and elevated rail lines aimed to handle bulk loads.

The freight yard is equipped with various essential facilities such as equipment to determine load weight, check shipment dimensions, communication systems, water supplies, lighting, and firefighting equipment. Moreover, there are offices for storage, information and freight yard management as well as facilities for employees, repair shops, garages, gantry, overhead and jib cranes, motorized loaders and other machinery to facilitate mechanized freight handling and warehouse operations.

The SGR lots 6 from Tabora to Kigoma have implemented designed freight yards at all major and medium stations namely Urambo, Kaliua, Usinge and Katosho respectively. These well-planned freight facilities play a crucial role in efficiently managing and handling cargo for the railway project.

#### 2.4.8.6 *TPS, ATS and Catenary*

The SGR line from Tabora to Kigoma will be powered by Traction Power Stations, Auto Transformer stations and Catenary systems all designed in accordance with relevant European Norms (EN). The system is comprised of Traction Power Stations connected to the grid at 220 kV, which then steps down the voltage to 25 kV to power the catenary system.

The design and specifications for the entire system, including the distance between Traction Power Stations, Auto Transformer Stations and Catenary systems are harmonized to accommodate all SGR project.

High Voltage Metering Units will be installed at the Traction Power Substations, equipped with the capability to transmit data to Operations Control Centre (OCC) and TANESCO. Construction of the 220 kV power transmission line is a separate project activity and is not covered in this ESIA.

#### 2.4.8.7 *Fence*

The SGR line from Tabora to Kigoma will be enclosed by a 2.1m high razor wire fence. This fencing will be constructed on all sides along the right of way, surrounding passenger stations, freight facilities and the Maintenance Complex. To ensure accessibility and prevent isolation of communities on both sides of the railway line, access roads will be located outside of the fence. Furthermore, special measures will be taken to provide overpasses and underpasses for people, animals and vehicles ensuring safe access across the SGR line.

To address the needs of wildlife, specialized fencing will be implemented in accordance with their migration and immigration corridors. To allow safe access for communities and livestock, underpasses and overpasses have been designed, allowing them to traverse the SGR line securely.

Overall, the implementation of the razor wire fence and construction of access points will enhance safety and accessibility while considering the well-being of both human communities and wildlife along the Tabora-Kigoma SGR line.

#### 2.4.9 **Land requirement for the project**

The land requirement for the SGR project from Tabora to Kigoma will depend on various factors, including the alignment of the railway corridor, the location of stations, maintenance facilities and other infrastructure components. The land requirement will also be influenced by the width of the railway track, the buffer zones and any additional land needed for construction, operation and safety measures.

The specific land requirement for the railway track is 60 m width. A comprehensive survey and assessment will be conducted to identify the precise land needed for various project elements, taking into consideration environmental and social impact assessments, safety regulations and local laws and regulations.

Furthermore, the land requirement may vary along different sections of the railway route as terrain, population density and existing land use patterns can vary. The project will strive to minimize land acquisition to the extent possible and prioritize using existing government-owned land and public land.

The land acquisition process will follow established legal procedures and guidelines guided by the Land Acquisition Act, Cap 118 R.E 2002, ensuring fair compensation and proper consultation with affected communities and landowners. The project will also aim to address any potential environmental and social impacts related to land acquisition and ensure that appropriate measures are in place to mitigate these impacts.

It is essential for the project to be conducted in a transparent and responsible manner, respecting the rights and interests of local communities and stakeholders while ensuring the successful implementation of the SGR line from Tabora to Kigoma.

## **2.4.10 Other Utilities**

### **2.4.10.1 Water Supply and Management**

Water is a critical resource required during the construction and operational phases of the SGR line project from Tabora to Kigoma. The project's water supply and management plan will involve obtaining water from various available sources along the railway route, such as rivers, lakes, boreholes or wells. The choice of water sources will depend on local hydrogeological conditions and water availability. Major rivers like Ruchungi and Malagarasi Rivers along with their relative tributaries in project locations within Uvinza and Kasulu District which are managed by the Rural Water and Sanitation Authority (RUWASA) will be utilized.

In areas where surface runoff is insufficient, particularly in Tabora and Uyui where water supply may be inadequate and rivers and streams tend to desiccate during the dry season from June to August, the project will explore the option of drilling boreholes as alternative water sources. Fortunately, the wet season occurs from November to April with relatively mild rains in September and October. However, the potential effects of climate change on water availability must be taken into account, necessitating the acquisition of water abstraction permits from Lake Tanganyika Water Basin Offices.

To address water scarcity, storage facilities like water tanks and reservoirs will be constructed strategically along the railway line. These storage facilities will store water during periods of high supply and serve as reserves during times of low supply or disruptions. Moreover, water sourced from both surface water bodies and groundwater may undergo treatment to ensure its suitability for various purposes including drinking water for staff and passengers, locomotive cooling and other operational needs. Treatment processes may include filtration, disinfection, and other measures to enhance water quality.

### **2.4.10.2 Waste Water Management systems**

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 levels. 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.

### **2.4.10.3 Storm Water Drainage**

The SGR project will implement effective surface drainage systems to control rainwater runoff. Grading and slope adjustments will ensure proper water flow towards drainage channels. A well-designed network of open channels, culverts and underground pipes will collect and transport stormwater away from the railway and surroundings. Strategically placed catch basins

and gullies will capture rainwater from paved surfaces while outlet structures, like outfall pipes and culverts will discharge collected stormwater to suitable points.

To prevent soil erosion and sedimentation, erosion control measures such as silt fences, erosion blankets and vegetation stabilization will be used in drainage channels. Positive surface slopes will be provided for new and existing surfaces around structures and facilities to avoid water seepage into groundwater systems. Stormwater drainage systems will direct water away from structures and longitudinal gradients of 0.5% will be maintained in ditches, swales and open channels.

Green areas will be managed to prevent both soil erosion and waterlogging, avoiding runoff onto pavements. Hydrological studies will be carried out during the detailed feasibility and geotechnical assessments to guide the design process. Considerations will be made for potential flooding areas due to climate change, such as Malagarasi floodplains, Nyamgongo, Ruhita wetland areas and various river floodplains.

#### 2.4.10.4 *Electric Power Supply*

The electrification systems for Phase I LOT 6 (Tabora-Kigoma) of the SGR project will adhere to standard specifications and interface with Phase I Dares Salaam to Mwanza and links of Kaliua-Mpanda and Uvinza to Gitega via Musongati SGR Project. This comprehensive implementation includes all associated equipment, grid connections and a tele-protection system between the 220 kV feeder Line in Line out of Traction Power Stations.

Station buildings and maintenance facilities, including the Marshalling Yard, Signalling and Interlocking (S&I) and Workshop will primarily receive power from the Power Utility Company, TANESCO. Additionally, they will have a secondary power source from generators with Uninterruptible Power Supply (UPS) backup systems. In case TANESCO power supply is unavailable, the primary power source will come from the catenary system, while the secondary source will be from generators with UPS backup systems. This dual power supply setup ensures a reliable and uninterrupted operation of the project.

Critical Signals and Telecommunications (S&T) equipment will primarily be powered by the Catenary System, complemented by a secondary power source from generators with UPS backup systems. To monitor fuel consumption and operational efficiency, all generators will be equipped with a monitoring system, recording the amount of fuel used whenever the generator is in operation or refueled.

## 2.5 ACCOMMODATION CAMP

### 2.5.1 Construction of Accommodation Camp

The temporary camp will be used for pioneer accommodation pending early completion of elements of the permanent camp and preparation of a suitable site for contractors to establish their workforce accommodation. Contractors will be required to construct the camp and use it but when construction is completed the contractor will be required to hand over the camp to TRC in good conditions. The camp will be used by contractor staff and senior contractor personnel subject to availability.

All unskilled and semi-skilled positions will be filled by residents of local towns and villages. A bus service will be provided to and from local population centres for workers. Only senior employees and contractors from outside the project specific area will be provided with accommodation on site.

The accommodation camp will provide accommodation for approximately 300 personnel. The camp will comprise the following:

- i. Dry mess with food storage and preparation, kitchen and dining facilities;
- ii. Camp administration offices and shop;
- iii. Recreational facilities such as Bar and TV area; and
- iv. Laundry building.

A commitment to local content will determine the construction methods and generally lead to the use of blockwork construction.

## **2.6 ESTIMATED PROJECT BUDGET**

The estimated project budget for Tabora-Kigoma SGR line is USD 2,216,210,871.75 Billion.

### 3 POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

#### 3.1 Introduction

The Tabora to Kigoma SGR project is subject to a comprehensive regulatory framework aimed at safeguarding the environment and communities in its vicinity. The TRC is fully committed to adhering to Tanzanian legislation and meeting obligations under international conventions and treaties. This chapter aims to explore and analyze the essential elements of the regulatory framework governing environmental and social aspects of the project. It provides an overview of relevant Tanzanian policies, legal and administrative frameworks, as well as international frameworks, principles, and standards applicable to the project's planning and implementation. The goal is to ensure that all project activities are carried out with strict compliance to these regulations and standards.

#### 3.2 National Policy, Legal and Institutional Framework

##### 3.2.1 Policies and Overarching Frameworks

Several Tanzanian policies emphasize the inclusion of environmental and social factors in the decision-making process to prevent and mitigate adverse effects related to project execution.

###### 3.2.1.1 *The Constitution of the United Republic of Tanzania 1977*

The United Republic of Tanzania Constitution of 1977, amended from time to time, holds a central position in the legal framework of the country, serving two essential roles. First, it functions as a grand norm, providing legitimacy to all other laws within the nation. This means that any law enacted in Tanzania must adhere to and be in harmony with the constitution, ensuring consistency and conformity. Second, as the supreme law of the land, it establishes the foundation upon which all legal matters are built, safeguarding the rights and principles of the country's governance.

- i. Equality before the law: According to Article 13(1) of the Constitution, all persons are equal before the law and are entitled, without any discrimination, to protection under the law. Along the same lines, Article 13(4) provides that no person shall be discriminated against by any person or any authority acting under any law or in the discharge of the functions or business of any state office;
- ii. Freedom of expression: Article 18(a) of the Constitution stipulates that 'subject to the laws of the land, every person is entitled to freedom of opinion and expression; that is to say, the right to freely hold and express opinions and seek, receive and impart information and ideas through any media. Article 18(b) states further that 'every citizen has a right to be kept informed of developments in the country and in the world which are of concern to the life of the people and their work and of question or concern to the community';
- iii. Right to property: The right to property and to receive fair compensation when land is acquired compulsorily by the state is enshrined Article 24(1), which states 'subject to provisions of the relevant laws of the land, every person is entitled to own property and has a right to the protection of his property held in accordance with law'. Article 24(2)

further states that ‘subject to the provisions of sub article (1), it shall be unlawful for any person to be deprived of property for the purpose of nationalisation or other purposes without the authority of law which makes provision for fair and adequate compensation’; and

- iv. *Duty to safeguard public property*: Article 27(1) highlights the importance of sustainable use of natural resources for the benefit of the citizens of Tanzania by providing ‘that every person is obliged to safeguard and protect the natural resources of the United Republic, state property and all property jointly owned by the people as well as to respect another person's property’.

### 3.2.2 Policy Framework

Numerous national policies and strategies are relevant and applicable to the proposed SGR project, providing essential guidelines and frameworks for its successful implementation. These policies cover various aspects, including environmental protection, sustainable development, infrastructure development, transportation and social welfare. By aligning the project with these policies, it is ensured that the SGR project will be in harmony with the country's overall development goals and contribute positively to the well-being of the people and the environment.

#### 3.2.2.1 *The National Environmental Policy (NEP) 2021*

The primary goal of the initial National Environmental Policy (NEP) in 1997 was to implement strategic measures to tackle key environmental issues in collaboration with government sectors and stakeholders. These issues included land degradation, limited access to clean water for rural and urban populations, loss of wildlife habitats and biodiversity, degradation of aquatic systems, deforestation and environmental pollution. The recently updated NEP in 2021 aims to address policy gaps and enhance the country's environmental management regime. It outlines twelve key objectives to further strengthen environmental protection and sustainable practices in Tanzania listed as follows:

- i. To strengthen coordination of environmental management in sectors at all levels;
- ii. To enhance environmentally sound management of land resource for socioeconomic development;
- iii. To promote environmental management of water sources;
- iv. To strengthen conservation of wildlife habitats and biodiversity;
- v. To enhance conservation of forest ecosystems for sustainable provision of environmental goods and services;
- vi. To manage pollution for safe and healthy environment;
- vii. To strengthen the national capacity for addressing climate change impacts;
- viii. To enhance conservation of aquatic system for sustained natural ecosystem;
- ix. To promote gender consideration in environmental management;
- x. To promote good governance in environmental management at all levels; and



- xi. To ensure predictable, accessible, adequate and sustainable financial resources for environmental management.

This Environmental Impact Assessment (EIA) aligns with the guidelines of the National Environmental Policy (NEP) and includes mitigation measures that the developer (TRC), contractor, and sub-contractors are legally obligated to follow. The implementation of these mitigation measures will be monitored through a prescribed process, and annual reports will be submitted to the National Environment Management Council. Failure to comply with these measures may result in penalties.

#### 3.2.2.2 *The National Land Policy 1995*

The National Land Policy is designed to address the dynamic and diverse land use needs of the country. It aims to establish a secure land tenure system, promote efficient utilization of land resources and foster inclusive social and economic development while safeguarding the ecological balance of the environment. The policy provides specific directives on land holding and tenure rights, ensuring equitable distribution of land and access for all citizens, even in unplanned areas. Additionally, it outlines procedures for valuing assets, providing compensation and resolving land disputes. By adhering to the National Land Policy, the country strives to achieve a balanced and sustainable development approach that benefits the entire population and safeguards the environment. Objectives outlined in the National Land Policy aim to:

- i. Promote an equitable distribution of and access to land by all citizens;
- ii. Ensure that existing rights in land, especially customary rights of small holders (i.e., farmers and herdsman who are most of the population in the country) are recognised, clarified and secured in law;
- iii. Set ceilings on land holding (later to be translated into statutory ceilings) to prevent or avoid the phenomenon of land concentration (i.e. land grabbing);
- iv. Ensure that land is put to its most productive use to promote rapid social and economic development of the country; and

This Environmental and Social Impact Assessment (ESIA) is designed to address the policy requirements and provide effective mitigation measures to minimize the project's impact on land resources and land tenure. The implementation of the project has the potential to result in land degradation and may pose a risk of land dispossession for local land users. Therefore, the ESIA aims to identify and address these concerns to prevent any adverse consequences on the environment and local communities. By implementing the appropriate mitigation measures, the project can proceed in a sustainable and responsible manner, ensuring the protection of land resources and the rights of local land users.

- v. Protect land resources from degradation for sustainable development.

#### 3.2.2.3 *National Water Policy (NAWAPO) 2002*

The main objective of the National Water Policy (NAWAPO) is to create a comprehensive framework for sustainable development and management of the country's water resources,

supported by a robust legal and institutional structure for effective implementation. The policy acknowledges the intricate relationship between water and socio-economic development, including environmental considerations. It emphasizes the significance of water in various sectors such as domestic use, agriculture, livestock, mining, energy, fisheries, environment, wildlife, tourism, forestry, navigation and trans-boundary needs. The NAWAPO advocates for integrated water resource management in Tanzania, aiming to ensure equitable and sustainable utilization of water resources for socio-economic development while safeguarding the environment.

The following NAWAPO principles are applicable to the Project:

- i. All water resources in the country are vested in the United Republic of Tanzania and every citizen has an equal right to access and use;
- ii. Water use for basic human needs has the highest priority. Water to sustain the environment and other uses are subject to social and economic criteria, which shall be reviewed from time to time;
- iii. Standards for in-stream flows, industrial effluents and other waste discharges to be developed will be enforced;
- iv. The 'polluter pays' principle shall apply in conjunction with other legal and administrative actions;
- v. Developments in water basins and water abstraction shall be subjected to permits and mandatory legal requirement for an ESIA;
- vi. Water related activities should aim to enhance or to cause least detrimental effects on the natural environment;
- vii. Water for environmental purposes shall be determined on the best scientific information available, considering both the temporal and spatial water requirements, to maintain the health and viability of riverine and estuary ecosystem;
- viii. The allocation and consumption of water for environmental purposes is to be given appropriate considerations;
- ix. Status of surface and groundwater resources, in terms of quantity, quality and its use shall regularly be determined and information made easily accessible to stakeholders and decision makers; and
- x. A sound information and knowledge base, including data on surface and groundwater

The SGR project is committed to strictly adhere to all provisions outlined in the National Water Policy during its planning and implementation phases. As the project will require water for various activities, it is dedicated to ensuring sustainable use and management of water resources, including enhancing water resource management within the project's influence area.

(quantity and quality), social and economic data shall be established.

#### 3.2.2.4 *Sustainable Industrial Development Policy 1996*

Section 3 of the Sustainable Industrial Development Policy emphasizes the significance of environmentally friendly and ecologically sustainable industrial development. It highlights the necessity of conducting an Environmental and Social Impact Assessment (ESIA) prior to undertaking any development project.

To effectively implement the Sustainable Industrial Development Policy, the project will prioritize sound environmental management and sustainability. Additionally, the Tanzanian Government seeks to promote the adoption of an integrated preventative environmental strategy, encouraging efficient use of raw materials and energy, elimination of toxic substances, and reduction of emissions and waste at the source. This Environmental Impact Statement (EIS) comprehensively outlines the types of waste to be generated and their safe disposal methods, ensuring full compliance with the policy's requirements.

*To effectively implement the Sustainable Industrial Development Policy, the SGR will prioritize sound environmental management and sustainability. It will actively promote the adoption of an integrated preventative environmental strategy by propagating efficient use of raw materials and energy, avoiding toxic substances and minimizing emissions and waste. It will ensure that safe disposal methods for generated waste are strictly followed to uphold the policy's environmental objectives.*

#### 3.2.2.5 *National Policy on HIV/AIDS 2001*

HIV/AIDS is a national and indeed, global problem that calls for concerted and unprecedented initiatives at national and global levels to manage effectively. In Tanzania, it poses a serious threat to health and development. The policy's specific objectives encompass various aspects: acknowledging HIV/AIDS as a global catastrophe, requiring coordinated actions from all stakeholders worldwide. It recognizes the detrimental impact of HIV/AIDS on development across sectors, affecting social and economic growth and straining social services and welfare systems. Moreover, the policy emphasizes the correlation between poverty and HIV/AIDS, as vulnerable populations, particularly the impoverished, are disproportionately affected. Addressing this complex issue demands comprehensive strategies and collaborations to combat HIV/AIDS and promote the well-being of our society.

Specific objectives of this policy include the following:

- i. Prevention of transmission of HIV/AIDS;
- ii. HIV testing;
- iii. Care for people who are living with HIV/AIDS;
- iv. Sectoral roles and financing; and
- v. To participate in HIV/AIDS research nationally and internationally.

The HIV/AIDS policy highlights the significant challenge posed by the stigma surrounding the epidemic, both in Tanzania and other countries in the sub-Saharan region. Stigma related to

The implementation of the SGR project may lead to an increase in the risk of HIV/AIDS transmission due to the influx of people seeking employment and income in the project area. This could potentially result in a higher incidence of sexually transmitted infections (STIs) and HIV/AIDS. Therefore, it is crucial for the project to strictly adhere to the Policy directives on HIV/AIDS prevention during its implementation to mitigate these risks.

HIV/AIDS remains pervasive and contributes significantly to the spread of the infection. The policy emphasizes the crucial role of every individual and the community as a whole in actively engaging in the prevention and control of the HIV/AIDS epidemic. These principles form the foundation of the national policy on HIV/AIDS and underscore the need for collective responsibility in combating this public health issue.

#### 3.2.2.6 *The National Gender Policy 2002*

The National Gender Policy aims to foster gender equality and promote equal participation of men and women in various aspects of society, including economic, cultural, and political matters. It seeks to create equitable opportunities for both genders, ensuring fair access to education, childcare, employment and decision-making processes. The policy provides essential guidelines to ensure the development of gender-sensitive plans and strategies across all sectors and institutions. It places significant emphasis on achieving gender equality and affording equal opportunities to men and women in development endeavors, valuing the contributions of each member of society.

The Project will promote gender equality and equal participation of men and women through its employment policies.

#### 3.2.2.7 *The Wildlife and Wetland Policy 2007*

The Wildlife and Wetland Policy of Tanzania prioritizes the conservation of wildlife as vital natural resources with significant biological, economic and nutritional value. It also emphasizes the importance of maintaining a clean environment, addressing climate concerns and conserving water and soil resources. The policy aims to sustain rich biological diversity, contributing to a healthy environment and national economy. It recognizes the potential impact of human and developmental activities on wildlife, both within and outside protected areas and advocates for thorough environmental assessments to minimize negative effects. The policy envisions the protection and conservation of wildlife and wetlands, with a focus on community and private sector participation. This involves raising awareness, capacity building and ensuring proper environmental impact assessments for projects within protected areas to safeguard biodiversity.

SGR will ensure wildlife is protected through management measures aimed at conserving biodiversity. This ESIA outlines specific measures to be implemented in areas with potential wildlife to ensure their protection and conservation

### 3.2.2.8 *The National Health Policy 2003*

The National Health Policy aims to enhance and sustain the overall health of the population by addressing disability, morbidity, and nutritional challenges while increasing life expectancy. It focuses on reducing the burden of diseases, maternal and infant mortality and ensuring access to adequate and fair healthcare services for all. The policy emphasizes the promotion of environmental health, sanitation and disease control measures. Collaboration with other stakeholders will ensure environmental cleanliness, food and water quality monitoring and overall safety.

The key objectives of this policy are to:

- i. provide geographically balanced and in acceptable standards, affordable and sustainable health services in general;
- ii. 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; and
- iii. prevent and control infectious and non-infectious diseases especially HIV/AIDS, malaria, tuberculosis, malnutrition and workplace diseases.

The proposed SGR project has the potential to both pose health challenges, aligning with the concerns of this policy, and contribute positively to its objectives by improving accessibility. To address any potential health impacts, this ESIA recommends a set of management measures to safeguard the well-being of the local communities and ensure that Project activities do not adversely affect their health.

### 3.2.2.9 *The National Construction Industry Policy 2003*

The Construction Industry Policy envisions a vibrant, effective and competitive domestic construction sector capable of handling projects of all sizes and actively engaging in regional and global markets to provide its services. The main objectives of the policy are to:

- i. Improve the capacity and competitiveness of the local construction enterprises;
- ii. Develop an efficient and self-sustaining roads network;
- iii. Improve the capacity and performance of the public sector and private sector clients so as to ensure efficient, transparent and effective implementation and management of construction projects;
- iv. Ensure efficient and cost-effective performance of the industry, while promoting innovative technologies; and
- v. Ensure application of practices, technologies and products that are not harmful to the environment or human health.

SGR will prioritise the use of local suppliers as per the policy requirements and consistent with regulations.

### 3.2.2.10 *National Forest Policy 1998*

The primary objective of the National Forest Policy is to enhance the role of the forest sector in promoting sustainable development and the conservation of natural resources in Tanzania. Key aims of the Forest Policy include ensuring a sustainable supply of forest products and services, creating employment opportunities and enhancing ecosystem sustainability through forest conservation and effective management. The policy acknowledges that development activities in forest areas can have adverse environmental impacts and thus requires environmental assessments to prevent damage and provide mitigation measures. The National Forest Policy covers four main policy areas: forest land management, forest-based industries and products, ecosystem conservation and management, and institutions and human resources. It is based on a macro-economic, environmental, and social framework and aims to manage Tanzania's forest resources as a national heritage in an integrated and sustainable manner to maximize their environmental, economic, social and cultural values. The policy aligns with the directives of the National Environmental Policy (1997) regarding forest resource management.

Over the past few decades, perspectives on the role of forests in society have evolved due to social, economic, environmental, cultural and political changes. Meanwhile, there have been increasing pressures on forest resources due to growing demands for fuelwood, fodder, timber, and land for various purposes. The overall objective of the policy is to effectively manage Tanzania's forest resources for the benefit of the nation, taking into account their diverse values and ensuring their sustainable use.

The proposed SGR route passes through national forest reserves or community forest reserves, so it is expected to impact forest resources. 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).

The implementation of the proposed SGR project will ensure strict compliance with relevant policies and regulations at every stage. By adhering to these policy provisions, the project aims to promote sustainable development, environmental conservation and social welfare.

### 3.2.2.11 *Cultural Heritage Policy 2008*

The policy aims to guide sustainable management of Tanzania's cultural heritage resources. It elaborates on the mission of cultural heritage management, emphasizes the importance of research and conservation and defines the roles of stakeholders and institutions in preserving cultural heritage. The policy encompasses tangible and intangible assets, both movable and immovable, at least 100 years old or deemed culturally significant by the Minister responsible for cultural heritage. Conservation of cultural heritage is closely linked to environmental conservation, as areas like forests, mountains and caves used for rituals or worship hold cultural value and contribute to environmental protection. The SGR project will adhere to this policy to conserve cultural resources within the Project area.

SGR will adhere to this policy to conserve cultural resources within the project area. These resources will be managed in compliance with the *Antiquities Act 1964 (Act No.10)* and the *Antiquities Amendment Act 1979(Act No.22)*.

### 3.2.2.12 *The National Employment Policy 1997*

The National Employment Policy focuses on two categories of employment: wage employment and self-employment. It examines the employment situation in various sectors, including government, parastatals, private sector, and the informal sector. The policy envisions utilizing the available labor force and natural resources to promote employment for Tanzanians. It identifies strategies for harnessing wealth in industries, trade, agriculture, livestock, fisheries, services, and small-scale mining. Special groups such as women, youth and persons with disabilities are also considered, along with measures to address the tendency of industries to employ expatriates over equally competent nationals. The primary goal is to promote employment opportunities for Tanzanian nationals, and the proposed transmission line contractor and operator will be encouraged to prioritize national employment.

This policy in paragraph 10 sets out strategies for promoting employment; paragraph 10.1 focuses on industry and trade sectors; paragraph 10.6 deals with employment of special groups i.e., women, youth, persons with disabilities and paragraph 10.8 which deals with the tendencies of industries to employ expatriates even where there are equally competent nationals.

Consistent with the Policy and provisions under the Employment Act, SGR is expected to employ suitably qualified and experienced Tanzanians during construction and operations. All unskilled and semi-skilled positions will be filled by residents of local villages and towns.

### 3.2.2.13 *The National Energy Policy 2015*

The newly introduced National Energy Policy aims to create a more conducive business environment to attract private investment and local participation in Tanzania's energy sector. It focuses on energy conservation and efficiency by enhancing access to modern energy services and increasing the share of renewable energies in the electricity generation mix, ensuring a reliable and secure energy supply. The policy's main objective is to guide the sustainable development and utilization of energy resources, delivering optimal benefits to Tanzanians and contributing to the transformation of the national economy.

The initial energy policy was established in April 1992, but the dynamic energy sector has undergone significant changes, requiring adjustments to the policy. These changes involve a shift in the government's role from service provider to facilitator, market liberalization, and encouragement of private sector investments. The overarching goal of this Policy is to foster efficient energy production, procurement, transportation, distribution, and end-user systems, all while prioritizing environmental sustainability and considering gender issues.

This new policy aims at improving the business environment to attract more private investment and local participation in the energy sector. The policy promotes energy conservation and efficiency by focussing on increasing access to modern energy service and increasing the share of renewable energies in the electricity generation mix to enhance availability, reliability and security of supply.

The main objective of the National Energy Policy is to provide guidance for sustainable development and utilisation of energy resources to ensure optimal benefits to Tanzanians and contributes towards transformation of the national economy.

During the operational phase of the proposed SGR, electricity will be utilized for various purposes such as train operations, marshalling yard activities, maintenance workshops, sleeper factory, rolling stock maintenance, station operations and office building lighting. Compliance with this policy principle is essential during this phase. The project will adhere to the policy principle.

#### 3.2.2.2 *National Community Development policy of 1997*

The policy implements measures that empower communities to unlock their potential by responsibly utilizing natural resources. The main goal of the Community Development Policy is to empower Tanzanians, whether as individuals, families or groups, to actively contribute to the government's goal of self-reliance and drive development at all levels.

The proposed SGR project is closely tied to community development, offering opportunities for employment, business, infrastructure improvement, and fostering growth in surrounding communities and townships. However, the potential loss of land, which is vital for the local communities' development, may lead to significant consequences on their overall progress and well-being.

#### 3.2.2.3 *National Transport Policy of 2003*

The primary objective of this policy is to create a comprehensive and seamless transport infrastructure and operations that prioritize safety, reliability, efficiency and effectiveness. It aims to cater for the evolving travel and transportation demands, providing improved services at reduced costs while aligning with the government's socio-economic development strategies. Additionally, the policy aims to achieve economic and environmental sustainability in its implementation.

In an optimistic scenario, the proposed SGR Project is expected to make significant contributions by providing an efficient and affordable domestic transport service to all sections of the population along its route. It aims to support various sectors of the national economy while prioritizing safety and minimizing environmental impact.

#### 3.2.2.4 *National Livestock Policy of 2006*

The Agriculture and Livestock Policy of 2006 addresses changes affecting the agricultural sector in Tanzania, particularly related to restrictions on agricultural practices due to the National Land Use Policy of 1995. The policy also emphasizes the importance of women in agriculture and the need for sustainable agricultural practices to protect the environment. It promotes responsible husbandry and increased agricultural production.

The National Livestock Policy aims to commercialize and stimulate the development of the livestock industry while ensuring environmental conservation. It seeks to improve the livelihoods of livestock farmers by increasing their income and achieving food self-sufficiency in animal products, in line with the goals of the National Strategy for Growth and Reduction



of Poverty (NSGRP) of 2004. The policy takes into account Tanzania's comparative advantage

The presence of pastoralists along the railway alignment intersecting the SGR raises considerations regarding the potential benefits and impacts on the livestock sector. Proper planning and design of underpasses and overpasses in areas with livestock-keeping communities become essential to address the relevant concerns and ensure the policy's relevance in managing these aspects.

of a large livestock population and considers factors like trade liberalization, globalization, privatization, public-private partnerships, and advancements in science and technology that impact the industry's growth. Emphasizing value addition, the policy aims to access competitive markets and extend the shelf life of livestock products.

#### 3.2.2.5 *National Climate Change Strategy of 2012*

The aim of national climate change strategy is to empower Tanzania to adapt to climate change effectively, participate in global climate change mitigation efforts and achieve sustainable development concurrently. The objective of the SGR project aligns with the 2012 National Climate Change Strategy by incorporating climate change scenarios from the initial design stage of determining the alignment.

#### 3.2.2.6 *National Agriculture Policy of 2013*

The policy aims to foster a productive and profitable agricultural industry that enhances the well-being of Tanzanians and contributes to overall economic growth and poverty reduction. It acknowledges the obstacles encountered by the agricultural sector in Tanzania and identifies potential opportunities for enhanced production and productivity if effectively harnessed. In relation to this project, inadequate infrastructure stands out as a major challenge for the sector.

In an optimistic outcome, the successful implementation of the SGR project will facilitate the growth of domestic, regional and international markets for diverse agricultural products by providing a secure, efficient and affordable means of transporting these commodities between markets. Furthermore, it will encourage the development of agribusinesses and medium to large-scale farms, consequently leading to a rise in employment opportunities in rural areas.

#### 3.2.2.7 *The National Occupational Health and Safety Policy of 2010*

The main objective of this policy is to ensure the prevention and management of workplace hazards while enhancing work processes and environments to optimize worker productivity.

During the implementation of the SGR Project, both unskilled and skilled workers will be employed. The Contractor and Employer will have the responsibility to provide a safe working environment, which includes ensuring that the workers are provided with appropriate protective gear and working tools. Regular toolbox training sessions will also be conducted to promote safety awareness among the workers throughout the project duration.

### 3.2.2.8 *The National Investment Promotion Policy 1996*

The National Investment Promotion Policy seeks to promote the growth of exports by strategically utilising the scarce natural, social and capital resources to accomplish national development. One of the key features of this policy is the promotion of exports emanating from domestically produced goods and services in order to enhance development of a dynamic and competitive export sector.

### 3.2.3 **Legal Framework - Acts**

Numerous national laws and regulations are relevant to the proposed SGR project, ensuring its compliance with legal requirements and standards.

#### 3.2.3.1 *The Environmental Management Act 2004, Written Law (Miscellaneous) (No. 3) Act, 2016 and 2021;*

The Environmental Management Act Cap 191 is the principal legislation governing environmental management in the country. The Environmental Management Act (EMA) recognises "...the right of every citizen to a clean, safe and healthy environment, and the right of access to environmental resources for recreational, educational, health, spiritual, cultural and economic purposes."

Thus, the EMA "provides a legal framework for coordinating harmonious and conflicting activities by integrating those activities into overall sustainable environmental management systems by providing key technical support to Sector Ministries."

To effectively implement the objectives of the National Environmental Policy (NEP), the Environmental Management Act (EMA) has defined and delineated the specific roles, responsibilities and functions of various key stakeholders. It establishes a comprehensive administrative and institutional structure, consisting of various components and authorities. This arrangement is designed to facilitate coordinated efforts and efficient management of environmental matters in the country. It is comprised of:

- i. National Advisory Committee;
- ii. Minister Responsible for Environment;
- iii. Director of Environment;
- iv. National Environment Management Council (NEMC);
- v. Sector Ministries;
- vi. Regional Secretariat; and
- vii. Local Government Authorities (City, Municipal, District and Town Councils).

Section 81, subsection 1 in Part VI of the EMA requires a project proponent or developer to undertake an Environmental Impact Assessment (EIA) at his/her own cost prior to commencement or financing of a project or undertaking.

The types of projects requiring EIA are listed in the third schedule of the Act. The EMA prohibits any development to be initiated without an Environmental Impact Assessment (EIA) Certificate.

Section 86, subsection 1, stipulates that "the NEMC shall upon examination of a project brief, require the proponent of a project or undertaking to carry out an Environmental Impact Assessment study and prepare an Environmental Impact Statement". According to the EMA (Subsection 1-4) the EIS should be submitted to NEMC, which carries out a review through its Technical Advisory Committee (TAC). The NEMC is also required to make a site visit during the review process for inspection and verification at the proponent's cost.

The present EIA process in Tanzania with insistence on public involvement can be divided into five main steps as shown on the chart below.

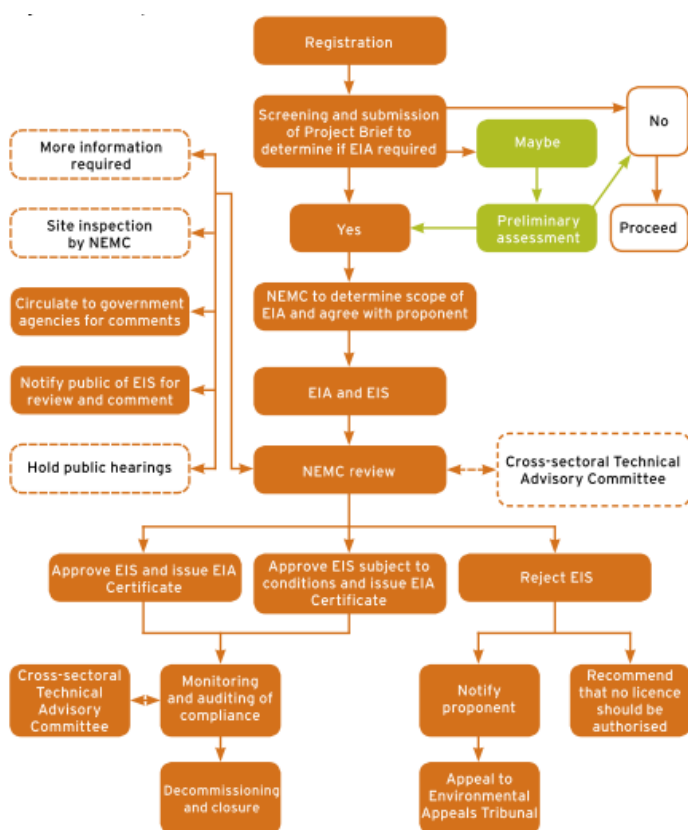


Figure 3-1: Chart representing ESIA steps in Tanzania: Source VPO, 2008

As per the requirements of the Environmental Management Act (EMA), TRC commissioned the Environmental and Social Impact Assessment (ESIA) to ensure compliance. They must commit to implementing the Environmental and Social Management and Monitoring Plan (ESMMP) outlined in the EIA report, along with any additional conditions set by the National Environment Management Council (NEMC), before obtaining an EIA certificate. The SGR project will adhere to the directives of the EMA by following its stipulated

### 3.2.3.2 *The Environmental Impact Assessment and Audit Regulations 2005*

Section 4(1) states that no developer or proponent shall implement a project:

- i. That is likely to have a negative environmental impact; and
- ii. For which an ESIA is required under the Act, the regulations or any other written law, unless an ESIA has been concluded and approved in accordance with these regulations.

Part IV of the regulations details the requirements for the ESIA, and stipulates the general objectives thereof and the procedures required to be followed.

Part VIII provides for the right of access to environmental information presented to NEMC by the public. Section 39(1) states that any project brief, EIS, terms of reference, public comments, report of a person presiding at a public hearing, decision letter or any other information submitted to NEMC under these regulations, shall be public documents.

Part IX stipulates that if an ESIA certificate has been issued, but no development has started within three years, the developer or proponent shall re-register any intention to develop with NEMC. Part X of the regulations details audit requirements and procedures.

The ESIA for the Project was undertaken in compliance with the process and requirements as detailed in the EIA and Audit Regulations. Annual environmental audits will be undertaken as prescribed in the regulations, in addition to ongoing monitoring and

### 3.2.3.3 *The Railway Act, 2017*

The Act, enacted in 2017, replaced the previous Railways Act No.4 of 2002 and paved the way for creation of the new railway company, Tanzania Railway Corporation (TRC), serving as the Employer. Its purpose is to provide guidance for the development, maintenance and advancement of railway infrastructure, rail transport services and related aspects. Under this Act, TRC is authorized to acquire, own and transfer both movable and immovable properties as well as engage in borrowing, lending and entering into various contracts and transactions.

### 3.2.3.4 *The Forest Act, 2002*

This Act pertains to the safeguarding of forests and forest products within forest reserves as well as the regulations and restrictions applicable in those areas. Forest Management plans are managed under the Forest Ordinance (1957).

Under the current Forest Act No. 14 of 2002, any development planned within a Forest Reserve, Private Forest, or Sensitive Forest necessitates the preparation of an Environmental Impact Assessment, which must be submitted to the Director of Forestry. The law states that: “any proposed development in a forest reserve, private forest or sensitive forest area including watersheds, whether that development is proposed by or is to be implemented by a person or organization in the public or private sector, the Developer shall prepare and submit to the Director an Environmental Impact Assessment of the proposed development”. Section 70 of the Act prohibits any person from burning any vegetation on any land outside the cartilage of his own house or compound without permission.

Furthermore, the law mandates licenses or permits for specific activities conducted within national or local forest reserves, including tree felling or removal, harvesting of forest produce, tourism or camping entry, mining activities, occupation or residence within the reserve and construction of structures.

The proposed SGR route traverses national and community Forest Reserves. To ensure compliance with the Forest Act and its provisions during project implementation, the SGR project will actively engage with forestry stakeholders and obtain all the required permits and approvals.

#### 3.2.3.5 *The Occupational Health and Safety Act, 2003*

This legislation mandates employers to ensure a safe and healthy working environment for employees to protect their well-being. The ESIA report has thoroughly assessed the possible occupational health concerns related to the Project and it includes detailed mitigation measures. The project will enforce contractual obligations on its contractors and suppliers to comply with the Operational Safety and Health Act 2003.

#### 3.2.3.6 *Wildlife conservation Act no 5 of 2009*

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 meters from the wildlife protected area borderline without the permission of the Director."

Additionally, Section 35:

- i. requires every significant physical development in a wildlife Protected Area, the Wildlife Management Area, the buffer zone, migratory route or Dispersal area to which this section applies, whether that development is prepared by or is being implemented by a person or organization in the public or private sector, the prospective Developer shall prepare and submit to the satisfaction of the Minister responsible for environment a report on Environmental Impact Assessment of the proposed development;
- ii. Notwithstanding sub-section (1) or any other law to the contrary, any development to which this section applies shall not commence unless and until an Environmental Impact Assessment certificate has been issued by the Minister responsible for environment; and
- iii. The developments in a wildlife protected area and Wildlife Management Areas to which this section applies shall include:

- a) Mining development;
- b) Road construction or laying of transmission lines;
- c) Semi or permanent establishments;
- d) Construction of dams, power stations, electrical and telecommunication installations; and
- e) Such other similar developments or activities as the Director may, for good cause, prescribe.

The Environmental Impact Assessment (EIA) will thoroughly assess the Project's interactions with species protected under international laws and treaties. TRC and its contractors will ensure compliance with this Act's requirements whenever they are applicable

#### 3.2.3.7 *The Explosive Act Cap 45 R.E 2002*

The Explosives Act of Tanzania is responsible for regulating the handling of explosives in the country. The act strictly prohibits anyone from engaging in activities related to explosives, such as import, manufacture, possession, acquisition, or disposition, without obtaining the required license. The Commissioner for Mines has the authority to issue permits for the manufacturing and use of explosives for blasting purposes. Additionally, the Act requires permits for the transport, acquisition, possession, disposal, and storage of explosives. Each permit may have specific conditions attached to it.

The SGR project will collaborate with relevant stakeholders and obtain all the required permits to ensure full compliance with the provisions of this act during the project's implementation. The relevant permits for acquisition, possession, storage, transportation or use of explosives are in place prior to commencement of construction.

#### 3.2.3.8 *The Land Act , 1999 (Act No.4/1999)*

This Act establishes essential principles for land occupation and utilization, including the requirement that land users ensure productive and sustainable use of the land in line with the principles of sustainable development.

Tanzanian land falls under three categories, namely:

- i. Reserved Land is land set aside for wildlife, forests, marine parks, etc., and the ways these areas are managed is explained in the laws that protect each sector (e.g. Wildlife Conservation Act, National Parks Ordinance, Marine Parks and Reserves Act, etc.). Specific legal regimes govern these lands under the laws used to establish them;

- ii. Village Land includes all land inside the boundaries of registered villages, where the Village Councils and Village Assemblies are given power to manage. The Village Land Act gives the details of how this is to be done; and
- iii. General Land is land, which is neither reserved land nor village land and is therefore managed by the Commissioner. The Land Act is governing this land.

The Land Act of 1999 (Section 34) also states that where a right of occupancy includes land which is occupied by persons under customary law, and those persons are to be moved or relocated, they must be compensated for loss of interest in the land and for other losses. They also have the right to reap crops that are sown before any notice for vacating that land is given. The Land Act (Section 156) requires that with regard to communal right of way in respect of way-leave, compensation shall be paid to any person for use of land, who is in lawful or actual occupation of that land, for any damage caused to crops or buildings and for the land and materials taken or used for the works. Requirements for the assessment of compensation are provided in the Land (Assessment of the Value of Land for Compensation) Regulations of 2001. Valuation shall be done by a qualified and authorized valuer.

The basic principle governing compensation is that none of the PAP should be made worse off by the project displacements. According to the Tanzanian legislation, market values should be applied when valuing the affected houses and structures. Households losing their residential premises are entitled to an "Accommodation allowance" to cover the cost of renting another premise for up to 36 months, while purchasing or building a new house. In case of no active rental markets, estimation of the monthly renting rates may also need to be done using alternative methods.

Compensation is granted to those having annual and perennial crops, including fruit trees. The values are assessed through a market value approach as proposed in the legislation, in particular under Section 179 of the Land (Assessment of the Value of Land for Compensation) Regulations, 2001 and are available at the Government District valuer's offices. The compensation therefore will include:

- i. Market value of the real property;
- ii. Disturbance allowance;
- iii. Accommodation allowance;
- iv. Transport allowance;
- v. Loss of profits;
- vi. Any other cost, loss or capital expenditure incurred with respect to the development of the subject land;
- vii. Interest at market rate; and
- viii. Provision of an efficient, effective, economical and transparent system of land administration.

The SGR project includes the resettlement of individuals and their properties. The project is fully committed to adhering to the entire process of valuation and compensation in accordance with the provisions of this law.

### 3.2.3.9 *The Village Land Act, 1999 (Act No.5/1999)*

The Village Land Act No. 5 of 1999 governs village land and all matters related to land tenure under the Village Councils. Section 8 (1), (2) and (3) of the Act empowers the Village Council to manage all village lands in accordance with the principles of a trustee with the villagers being the beneficiaries. In exercising these functions, the Village Council is required to have regard to the following principles:

- i. Sustainable development and the relationship between land use, other natural resources and the environment in and contiguous to the village;
- ii. The need to consult with and take account of or comply with the decisions or orders of any public officer or public authority with jurisdiction over any matter in the area where the village is; and
- iii. The need to consult with and take into account the views of other local authorities with jurisdiction over the village.

While the Village Land Act acknowledges the role of Village Councils in land management, a significant portion of land in villages is held by individuals through customary land rights. It is essential to recognize and respect the rights of individuals to the land, ensuring that development activities do not exceed the land required for their specific purposes.

### 3.2.3.10 *The Water Resources Management Act, 2009*

The Act serves as a comprehensive framework for the sustainable management and development of water resources, laying down principles for water resource management and pollution prevention. It also emphasizes stakeholder and public participation in implementing the National Water Policy. For the SGR Project, extensive water demand is expected during construction, dust suppression, and for camp operations. The necessary permits will be obtained, ensuring compliance with the Act's regulations regarding water usage. The Act designates the President as the trustee with ownership of water sources and sets up mechanisms for harvesting and usage. Additionally, it establishes the National Water Board and Basin Water Boards, each with specific functions related to water management. These Boards have the authority to acquire lands under the Land Acquisition Act when necessary. The Act also empowers the Minister to transfer easements registered in water rights as required.

The SGR Project will utilize water from various surface water and groundwater sources. The project will obtain all necessary permits and diligently comply with the permit conditions. This includes monitoring and reporting water usage to the relevant Water Authority to ensure strict adherence to the permit requirements.

### 3.2.3.11 *The HIV and AIDS (Prevention and Control) Act, 2008*

The law requires public education and initiatives on HIV and AIDS. According to Section 8(1), the Ministry of Health, healthcare professionals, public and private sector workers and NGOs are responsible for disseminating information about HIV and AIDS to the public. Additionally,



Section 9 mandates that every employer, in consultation with the Ministry of Health, must establish and coordinate a workplace program on HIV and AIDS for their employees, which includes providing gender-responsive education on the topic. The HIV and AIDS prevention and control act No. 28 of 2008 section 4 requires every person, institution and organization living, registered or operating in Tanzania shall be under general duty to:

- i. Promote public awareness on cases, mode of transmission, consequences, prevention and control of HIV and AIDS;
- ii. Reduce the spread of HIV AIDS, prevalence of STI in population and adverse effect of HIV and AIDS;
- iii. Prohibit compulsory HIV test unless provided for, fighting stigma and discrimination;

The Project Contractor will be responsible for creating and implementing an HIV/AIDS policy and information document for all workers directly involved in the Project.

- iv. Increase access care and support person living with HIV/AIDS; and
- v. Prevent tradition and culture subject to increase spread of HIV and promote tradition and culture subject to stop HIV AIDS spread.

#### 3.2.3.12 *The Employment and Labour Relations Act Cap 366 R.E 2019*

The Employment and Labour Relations Act encompasses essential labor rights and establishes fundamental employment standards, as well as mechanisms for preventing and resolving disputes. In Part II, the Act outlines key rights and protections for child labor, forced labor, discrimination, and freedom of associations. Part III focuses on employment standards, addressing aspects such as working hours, remuneration, leave entitlements, unfair termination of employment, and other related matters. The Act ensures a comprehensive framework for promoting a fair and reliable employment environment, while also safeguarding the well-being and rights of workers. Section 19-(1), (2), (3) and (5) details working durations and overtime conditions, and Section 31 provides information on employment leave. Additionally, Section 32-(1), (2) and (3) outlines payment provisions for risk and maternity employees, sick leave, and maternity leave.

TRC and the Contractor are responsible for ensuring that all aspects of recruitment and human resources for the project comply with the employment standards and requirements specified in this Act.

#### 3.2.3.13 *The Workers Compensation Act, 2015*

The Act focuses mainly on:

- i. Provision for adequate and equitable compensation for employees who suffer occupational injuries or contract occupational diseases arising out of, and in the course of their employment, and in the case of death to their dependants;

- ii. Provision for the rehabilitation of employees who have suffered occupational injuries or contacted occupational diseases in order to assist in restoring their health in dependence and participation in society;
- iii. Provision for a framework for the effective prompt and empathetic consideration, settlement and payment of compensation benefit to employees and their dependants;
- iv. Provide for the establishment, control and administration of workers to compensation fund, and the legal frame work for the contribution to the payment from the fund;
- v. Give effective to international obligations with respect to compensation;
- vi. Promote prevention of accidents and occupational disease; and
- vii. The contractors of this proposed project are required to comply with this Act to ensure that workers compensation are equitable to the prevailing national regulations.

#### 3.2.3.14 *The Grazing Land and Animal Feed Resources Act, 2010*

This Act aims to establish regulations and guidelines for the management and control of grazing-lands, animal feed resources, and animal trade.

The Tabora Kigoma SGR project's Environmental and Social Impact Assessment (ESIA) will include mitigation measures to minimize the impact on grazing land, as the project is expected to intersect with grazing land in various villages along its route.

#### 3.2.3.15 *The Antiquities Act No. 10 of 1964 and Amendment No. 22 of 1979*

Principal legal instrument for the preservation and protection of sites and articles of Paleontological, Archaeological, Historical or Natural interest. The Environmental and Social Impact Assessment (ESIA) for the SGR Project will consider and address issues relevant to the principal legal instrument for the preservation and protection of sites and articles of paleontological, archaeological, historical or natural interest. Specific recommendations will be made in the ESIA to ensure the protection and preservation of any cultural and historical resources that may be encountered during the construction of the railway line.

#### 3.2.3.16 *The Mining Act 2010; Cap 123 R.E 2019*

According to this Act, the term "building material" encompasses various substances such as rock, stones, gravel, sand, clay, volcanic ash or cinder and other minerals used in constructing buildings, roads, dams, aerodromes or similar projects. However, it does not include gypsum, limestone used to produce lime or materials utilized in cement manufacturing.

This Act makes sure minerals are well controlled and Section 6(1) states that "no person shall, on or in any land to which this act refers, prospect for minerals or carry-on mining operations except under the authority of Mineral Right granted or deemed to have been granted under this Act." In additional section 50 (1) (v) of the Act states that "The Minister shall grant an

The SGR project will obtain the necessary mining permits before commencing any sand, gravel, or other mining activities. In cases where these materials are sourced from suppliers, the project will ensure that the suppliers are licensed and compliant with regulations before utilizing their services.

application for a mining license for minerals which has been properly made under section 49 and a successful application for a mining license made under section 71 unless the applicant has not included the relevant environmental certificate issued under the Environment Management Act.

#### 3.2.3.17 *The Land Use Planning Act of 2007*

The Land Use Planning Act outlines procedures for creating, managing and enforcing land use plans with the goal of safeguarding human settlements and ecosystems from pollution, degradation and destruction to achieve sustainable development. Section 22 of the Act grants Local Government Authorities the authority to ensure organized and environmentally sustainable development in villages, wards, and the preservation of land resources, including forests and wildlife. The Act empowers the authorities with the ability to enforce approved land use plans, including taking legal action against those who do not comply. The project proponent must adhere to the Land Use Plan requirements for the project's location (e.g., industrial zone) and any changes in Land Use must be approved by the relevant authorities.

*The SGR project involves establishing a 30 m right of way on either side of the centerline, which will require the acquisition of additional land. The process of land acquisition is governed by the Lands Act.*

#### 3.2.3.18 *The Land Acquisition Act Cap 118 R.E 2002*

The Act allows for the compulsory acquisition of lands for public purposes and housing schemes. The President is empowered to acquire land for any necessary estate or term to serve public objectives. Compensation procedures are outlined in the Act (section 11) to provide fair compensation to landowners or users affected by land acquisition for project development.

However, the Act lacks provisions mandating the disclosure of Resettlement Action Plans or Livelihood Restoration Plans, which are necessary when a project disrupts people's livelihoods. As certain project components may involve land acquisition, international standards will apply to ensure the protection and appropriate compensation of affected properties or displaced individuals.

*Throughout the entire resettlement and compensation process, TRC will ensure strict adherence to the provisions of this Act.*

#### 3.2.3.19 *The Urban Planning Act, No. 8 of 2007*

The Act's objectives encompass making serviced land available for shelter and human settlements development to all community members while enhancing infrastructure and social services for sustainable growth. Section 29 of the Act stipulates that no development can occur within a planning area without the consent of the planning authority. Any development proposal that may impact the environment, such as industrial locations, dumping sites, sewerage treatment or quarries, requires an accompanying ESIA report for planning consent.

The Urban Planning Act of 2007 grants the power to create plans in advance of development, establishing a comprehensive system of development control. It allows for the declaration of

planning urban areas by the Minister responsible for Urban Planning, along with the formation of Urban Planning committees and procedures for scheme preparation and approval. The long-standing master plans have served as crucial tools in guiding urban development in Tanzania for over four decades. These plans facilitate both overall planning and the preparation of detailed schemes and project plans. When siting the project within urban planning areas, consultation with the master plan is essential to align with existing urban development plans effectively.

The ESIA for the proposed SGR project will meet the criteria set forth in the Urban Planning Act, specifically in section 29. It will address significant impacts linked to the project and propose appropriate mitigation measures to minimize these impacts.

#### 3.2.3.20 *The Land Transport Regulatory Authority Act, 2019*

The Act has created the Land Transport Regulatory Authority, responsible for regulating the land transport sector. The Authority is empowered to oversee various aspects, including coordinating land transport safety activities, registering crew and certifying drivers of regulated vehicles, ensuring the roadworthiness of public service and goods vehicles, and issuing, renewing, or canceling permits or licenses.

*The SGR project will adhere to the regulations outlined in this act, as certain project components will involve the construction of access roads, and a significant portion of construction materials will be transported by road.*

#### 3.2.3.21 *Water Supply and Sanitation Act, No.5 of 2019*

The Water Supply and Sanitation Act, (No 12), 2009, is the principal legislation aiming to promote and ensure the right of every person in Tanzania to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account the following principles:

- i. Creation of an enabling environment and appropriate incentive delivery of reliable, sustainable and affordable water supply and sanitation services;
- ii. Delegation of management functions of water supply and sanitation to the lowest appropriate levels taking into account the local government administrative systems;
- iii. Ensuring that water sanitation authorities are financially and administrative autonomous and sustainable;
- iv. Transferring ownership of water supply schemes in rural areas the respectively communities and enabling all the beneficiaries and stakeholders to participate in respectively in the management of community water supply schemes;
- v. Enabling mechanism to ensure that the communities meet the cost of operation and maintenance of their water supply systems and contribute to the cost thereof;
- vi. Promotion of public sector and private sectors partnership in provision of water supply and sanitation service;
- vii. Establishment an enforcement of standard of service in water supply and sanitation service;
- viii. Regulation of suppliers of water supply and sanitation services;

- ix. Protection and conservation of water resources and development and promotion of public health and sanitation; and
- x. Protection of the interests of customers.

#### 3.2.3.22 *Energy and Water Utilities Regulatory Authority Act of 2001*

This Act consolidates the legislation related to energy and water utilities in Tanzania Mainland. It empowers EWURA, with prior approval from the Minister, to establish rules governing the regulated goods and services in sectors such as electricity, petroleum, natural gas, water, and sewerage. EWURA is authorized to issue, renew, and cancel licenses for service providers in these regulated sectors. Existing license holders and potential applicants can submit their license applications to EWURA for review, and the authority evaluates them using fair and non-discriminatory procedures. Additionally, the Act requires EWURA to conduct a public inquiry before making decisions regarding license issuance, renewal or cancellation.

The SGR project plans to utilize energy from TANESCO through the existing generator connection initially, with the anticipation of later connecting to the national grid. This energy will be used to power the railway transmission line and substations.

#### 3.2.3.23 *The Petroleum Act, 2015*

This law regulates the importation, exportation, transportation, transformation, storage, wholesale, and retail distribution of petroleum products in a liberalized market. Section 7 of the law prohibits individuals and institutions from engaging in petroleum supply operations without obtaining the required license as stipulated in the act. Section 8 (1) states that before issuing the license, applicants must adhere to all the necessary environmental requirements as specified in the Environmental Management Act.

The project will store and transport petroleum products between camps and sites during its implementation. To comply with the law, the project will obtain the necessary licenses for petroleum product storage and ensure that transportation adheres to the requirements of this Act.

#### 3.2.3.24 *The Tanzania Investment Act, (2002)*

The Tanzania Investment Act outlines the requirements and conditions for conducting business and investing in Tanzania. It includes provisions for incentives offered to investors, immigration quotas for foreign workers, procedures for obtaining credit from domestic sources, and technology transfer guidelines. However, it lacks specific provisions for ensuring environmentally responsible investment activities. The project must comply with this Act and other relevant laws concerning investment and local content in Tanzania.

#### 3.2.3.25 *The Industrial and Consumers Chemicals (Management and Control) Act of 2003*

The Act covers various aspects, including the importation, transportation, storage, use, and disposal of chemicals in Tanzania. The contractor involved in the railway project is obligated to obtain a certificate from the Chief Government Chemist for importing, storing, or disposing of any chemicals like Asphalt or Lime. Additionally, the railway contractor must adhere to all regulations and provisions set forth by this Act concerning the packaging, handling, storage,

use, and disposal of chemicals. The Minister appoints inspectors to monitor compliance and failure to comply may result in certificate revocation.

The TRC will collaborate with the relevant authority (GCLA) to acquire the necessary certificate and ensure that contractors strictly adhere to the conditions of the certificate and the requirements outlined in this Act. Additionally, the contractors will be inspected and regularly monitored in accordance with the provisions specified in Part III and IV of the Act.

#### 3.2.3.26 *Public Health Act of 2009*

This Act aims to promote, preserve and uphold public health by ensuring the availability of comprehensive, functional and sustainable public health services to the general population. It covers various aspects related to public health and addresses matters crucial for the well-being of the public.

Part III section 37 (1) A person shall not discharge into waters of the seaport, lake, or river port, any oil, grease, ballast, waste, sewage or any other to pollute substance likely to pollute the water or the coastline which may be of detrimental to navigation or cause any inconvenience to the shipping industry, aquatic life and recreational activities which may create any health hazard to the public.

Section 54 states that a person shall not cause or suffer from a nuisance, likely to be of nuisance injurious or dangerous to health, existing on any land, premises, air or water and section 88 where it states that a person shall not import hazardous wastes or any other wastes into Mainland Tanzania. In general, the proposed project should not endanger public health. Any impact that is likely to impact the public health must be mitigated or avoided.

The present ESIA study has thoroughly assessed the potential impacts of the Project on public health, and appropriate mitigation measures have been detailed to address these concerns.

#### 3.2.3.27 *Child Act of 2009 revised in 2019*

The main aim of this law is to safeguard and preserve the rights of children. In relation to the SGR project, it addresses issues such as child labor and violence against children. Specifically, Section 12 of the law strongly emphasizes the prohibition of harmful employment of children. It states that no individual shall employ or involve a child in any activity that could negatively impact their health, education, mental, physical or moral development.

Furthermore, the law focuses on protecting children from all forms of exploitation, violence, and abuse. It defines "child abuse" as any violation of a child's rights that leads to physical, moral or emotional harm, including acts like beatings, insults, discrimination, neglect, sexual abuse and exploitative labor. The law is designed to ensure the well-being and safety of children, promoting their healthy development and protecting them from harmful practices and situations.

The SGR project is committed to adhering to this law to ensure the protection of children from any form of abuse. This includes preventing child labor and ensuring that children are not engaged in any activities that could be harmful to their physical, mental, or moral development.

### 3.2.3.28 *Grave Removal Act of 1969*

The Graves Removal Act gives the Minister responsible the power to remove the graves for public purposes. The act states that

*"... where any land for which a grave is situated is required for public purposes, the Minister may cause such grave and any dead body buried therein to be removed from the land and in such case shall take all such steps as they may be requisite or convenient for reinstatement of the grave and the refinement of the dead body in a place approved by him for the purpose".*

This Act is relevant to the proposed SGR route as some individual graves are likely to be found along the proposed route, which must be protected during the implementation of the project or possibly be relocated.

### 3.2.3.29 *National Museums Act Number 7 of 1980*

This Act is dedicated to the conservation, curation, and management of movable objects and artifacts in museums. It outlines the principles and guidelines for the proper care and preservation of historical and cultural items that are part of the nation's heritage. The law ensures that museums follow best practices in handling and storing artifacts to prevent damage or deterioration.

### 3.2.3.30 *Engineers Registration Act 2007*

The Act regulates the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board. The Act requires any foreign engineer to register with the Board before practicing in the country. Both foreign and local engineers working with the Project shall abide with the requirements of the Act.

TRC will ensure that all engineers engaged by the Company on the Project will comply with the requirements of the Act.

## 3.2.4 **Regulations and Guidelines**

### 3.2.4.1 *Environmental Impact Assessment and Audit Regulations No. 349 of 2005 as amended in 2018*

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).

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:

- i. Type A Projects requiring a mandatory ESIA;
- ii. Type B1- Borderline projects;

- iii. Type B2 -Projects that are no mandatory; and
- iv. Special Projects category.

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.

#### 3.2.4.2 *The Environmental Management (Registration and Practice of Environmental Experts) Regulations, 2021*

These Regulations pertain to Environmental Experts and the formation of the Environmental Expert Committee. The regulations also classify experts based on their specific expertise and level of experience. As a special Type A project, the SGR lot requires a mandatory ESIA that necessitates the involvement of registered experts with relevant experience to carry out the assessment.

#### 3.2.4.3 *The Environmental Management (Hazardous Waste Control and Management) Regulations, 2021*

The Regulations oversee the management of all types of hazardous waste, encompassing their generation, collection, storage, transportation, treatment, recycling, reuse, recovery and disposal within Mainland Tanzania. Due to the possibility of hazardous waste generation at the SGR garage and workshops, the contractor must comply with these regulations and also follow the World Bank Group Environmental, Health, and Safety Guidelines for Railways from April 2007.

#### 3.2.4.4 *The Environmental Management (Control and Management of Electrical and Electronic Equipment Waste) Regulations, 2021*

The regulations apply to all types of electrical and electronic equipment waste, covering various aspects such as generation, collection, storage, transportation, importation, exportation, distribution, selling, purchasing, recycling, refurbishing, assembling, dismantling, and disposal within Mainland Tanzania. As the SGR project activities may generate electrical and electronic equipment waste, the contractor is obligated to comply with these regulations and also adhere to the World Bank Group Environmental, Health, and Safety Guidelines for Railways from April 2007.

#### 3.2.4.5 *The Environmental Management (Prohibition of Plastic Carrier Bags) Regulation, 2022*

The purpose of the Regulations is to completely prohibit the import, export, manufacturing, sale and use of plastic carrier bags, irrespective of their thickness. All contractors and subcontractors involved in the SGR project are required to abstain from using the prohibited plastic carrier bags. Additionally, TRC management will enforce limitations on the use of banned plastic bags during the operation of the SGR.



#### 3.2.4.6 *Environmental Management (Air Quality Standards) Regulations 2007*

Part III 7(1) of these regulations requires every person to comply with the minimum air quality standards approved and published pursuant to these regulations. Thus no person shall emit or release any hazardous substance, chemical, gas or mixture containing gaseous and hazardous substance into the environment unless such emission or release is permitted under these regulations or any other written law. The limit for fugitive dust emissions are stipulated in the Second Schedule to the regulations.

Furthermore Section 23(1) mandates NEMC, a city environmental management officer, municipal environmental management officer, a District environmental management officer and a town environmental management officer to ensure a protection order against activities likely to result in adverse effects on air quality or to the environment or public health.

The air quality management and monitoring plan presented as part of this ESIA will be implemented. Guideline emissions limits will be observed and where limits are not prescribed under the regulations, the Project will apply internationally recognised standards.

#### 3.2.4.7 *Environmental Management (Soil Quality Standards) Regulations 2007*

Soil in terms of these regulations is defined as ‘earth, sand, rock, shell, mineral, vegetation and the flora and fauna in the soil and derivatives thereof such as dust’. The objectives of these Regulations relevant to the Project are to:

- i. Set limits for soil contaminants in agriculture and habitat;
- ii. Enforce minimum soil quality standards prescribed by the National Environmental Standards Committee;
- iii. Prescribe measures designed to maintain, restore and enhance the sustainable productivity of the soil;
- iv. Prescribe minimum soil quality standards to maintain restore and enhance the inherent productivity of the soil in the long term;
- v. Ensure implementation of criteria and procedures prescribed by the National Environmental Standards Committee for the measurement and determination of soil quality; and
- vi. Prescribe measures and guidelines for soil management.

The soil and erosion management and monitoring plan presented as part of this EIS will be implemented. Soil quality guidelines will be adhered to, particularly post closure to ensure inherent productivity is retained. The SGR Tabora Kigoma project is likely going to generate significant amount of solid waste and its management must comply with these regulations.

#### 3.2.4.8 *Environmental Management (Water Quality Standards) Regulations 2007*

Water in terms of these regulations is defined as ‘drinking water, river, stream, water-course, reservoir, well, dam, canal, channel, lake, swamp, open drain or ground water’.

The Regulations aim to enforce minimum water quality standards set by the National Environmental Standards Committee, allowing them to determine water usages for establishing environmental quality standards and values. The goal is to protect human health and preserve marine and aquatic environments by considering the capacity of receiving water to handle contaminants. The Regulations detail the role of the National Environmental Standards Committee in setting minimum quality standards for water and sewerage. They also include prohibitions and prescribed minimum water quality standards. Applicants seeking water rights must assess the potential environmental impact and adhere to specified effluent or receiving water standards, which should not fall below the prescribed standards in the regulations if the water right or permit is granted. Additionally, the regulations empower NEMC to designate major water polluting activities that require prior permits from the Council. They outline recording and reporting requirements, penalties for non-compliance and procedures for handling appeals against unfavorable decisions.

The regulations require any person to protect water sources and groundwater. Section 6(1) prohibits any person to discharge any hazardous substance, chemical, oil or mixture containing oil in any waters, except in accordance with what is prescribed under these regulations or any other written law. Regulation 7(1) requires an application for a water right or permit for the abstraction and use of water to be submitted to the Basin Water Officer.

Section 8(1) requires a holder of a water right or permit to comply with effluent or receiving water standards prescribed by any other written law provided that they are not below the standards prescribed under these regulations.

#### 3.2.4.9 *The Environmental Management (Standards for Control of Noise and Vibration Pollution) Regulations 2015*

The regulations prohibit a person to make any loud, unreasonable and unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and of the environment, and describes the permissible noise levels from different facilities. According to Regulation 8, the owner of the machinery or the occupier of the facility or premises has a duty to control noise. 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). The second schedule to the regulations stipulates the tolerance limits for environmental vibration.

#### 3.2.4.10 *The Environmental Management (Hazardous Waste Management and Control) Regulations 2009*

These regulations have been made under Regulations 110(4) and (5), 128, 133 (4), 135 and 130 of the Environmental Management Act, 2004. The regulations control all categories of hazardous wastes and the generation, storage, transportation, treatment, disposal and movement thereof into and out of mainland Tanzania.

The owner or controller of a facility or premises that generates hazardous and toxic wastes shall adopt clean production principles i.e., improvement of production process through conserving raw materials and energy and monitoring the product cycle from beginning to end to minimise waste generation.

All hazardous waste must be handled and stored in a suitable manner that ensures safety to the environment and human health.

Packaging of hazardous wastes should be in United Nations approved containers or packaging capable of containing or storing the wastes and containers must be labeled in English or Kiswahili language affixed onto it identifying the waste, name and address of the generator etc.

A licence for treatment or disposal of hazardous wastes must be applied for and the application accompanied by an Environmental Impact Assessment Certificate and an Emergency Response Plan.

#### **3.2.4.11 *The Environmental Management (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. The regulations outline the requirements, responsibilities and administrative mandates in management of various solid wastes. Section 6 states that every person living in Tanzania has a duty to safeguard the environment from the adverse effects of solid wastes and to inform the relevant authority on any activity and phenomenon resulting from solid waste that is likely to adversely affect the public health and environment.

The second schedule to these regulations provide the details required for any person who wishes to apply for a licence for waste disposal while the first schedule lists all types of solid wastes, their treatment/recycling methods and their anticipated final disposal methods. The SGR project is likely going to generate significant amount of solid waste and its management must comply with these regulations.

#### **3.2.4.12 *The Environmental Management (Fees and Charges) (Amendment) Regulations 2018***

These regulations may be cited as the Environmental Management (Fees and Charges) (Amendment) Regulations 2018, and shall be read as one with the Environmental Management (Fees and Charges) Regulations 2008. These regulations were made under Section 230 (2) (b) of the EMA. It requires that any person who wishes to perform any function related to the prevention, protection, promotion or conservation of the environment or carry on business related to the list below, comply with the fees and charges as per the regulations:

- i. Environmental impact assessment, environmental audit or environmental monitoring;
- ii. Registration as environmental expert;
- iii. Environmental quality standards; and
- iv. Ozone depleting substances.

#### **3.2.4.13 *The Land (Assessment of the Value of Land for Compensation) Regulations 2001***

The Land Regulations form the basis for evaluating the market value of land to be acquired, ensuring that the compensation rate is reasonable and adequate. Two main compensable categories are outlined: land and unexhausted improvements, defined in the Land Act. Land includes the earth's surface and naturally growing trees and vegetation. Unexhausted

improvements refer to any permanent additions to the land resulting from labor and capital investments.

Qualified valuers are responsible for conducting compensation valuations, and each valuation must be endorsed by the Chief Valuer according to Tanzanian law. Compensation for loss of any interest in land encompasses the value of unexhausted improvements, disturbance allowance, transport allowance, accommodation allowance and loss of profit.

Regulation 13 (2) defines 'prompt compensation payment' as payment of compensation within six months of the acquisition of the targeted land. Regulation 13 (3) states that where the amount of compensation remains unpaid for six months after acquisition or revocation, interest at the average percentage rate of interest offered by commercial banks on fixed deposits shall be revocable until such compensation is paid.

#### 3.2.4.14 *The Forest (Amendment) Regulations 2020*

The Forest (Amendment) Regulations are to be considered together with the Forest Regulations 2004. According to these regulations, it is prohibited to cut down or remove any forest produce without obtaining the necessary written permission and relevant licenses as specified in the regulations. Additionally, the Fourteenth Schedule of the Regulations outlines specific tree species that are classified as protected species and will be treated as such in this Environmental Impact Statement (EIS).

#### 3.2.4.15 *The Industrial and Consumer Chemicals (Management and Control) Regulations 2019*

The Industrial and Consumer Chemicals Management and Control (Amendment) Regulations 2019 shall be read as one with the Industrial and Consumer Chemicals (Management and Control) Regulations 2015. These regulations provide specific directives for the importation and exportation of chemicals, as well as the transportation, production and use of chemicals. Part V 22 (1) of the regulations states that, any person who uses or produce a chemical shall:

- i. Be registered and issued a certificate;
- ii. Register the premises and chemicals;
- iii. Create awareness to the public on the inherent risk of indiscriminate use and misuse of chemicals; and
- iv. Set and adhere to the code of practice and guidelines on the safe use and handling of chemicals.

Part V Section 22(3) of the regulations requires a registration of chemical producer or user in accordance with the categories set under the second schedule to these regulations and Section 22(4) requires a person who apply for registration shall register the premises in accordance with the provision of Section 27 of the Act.

Section 23(1) states that a person shall not use a chemical for the purpose that it was not intended for.

The regulations also set out the duty of chemical importers or users on the storage requirements under Section 26(1). The Project will observe and abide with the provisions of this Act.

#### 3.2.4.16 *The Explosives Regulations 1964 and The Explosives (Manufacturing) Regulations 2019*

The Explosives Regulations of 1964, GN 56/64 and the Explosives (Manufacturing) Regulations establish conditions for licensing stores, magazines, storage boxes and manufacture of explosives and general safety precautions for explosives. They also stipulate the nature of work which is permissible when blasting and the requirement that storage places for explosives be at a certain distance from other buildings. It also guides on the precautions on handling and transportation of explosives. A condition on all of the licenses is that the explosives must be stored in a licensed magazine or store or approved storage boxes.

#### 3.2.4.17 *The Railways (Safety Standards of Infrastructure and Rolling Stock) Regulations, 2018*

According to the Regulations, TRC is required to establish, implement and uphold safety standards concerning the railway infrastructure. The width of the formation level should be designed to ensure the proper functioning of the track, considering various factors like the gauge, track structure, permanent way appurtenance, maintenance work, and other relevant considerations. The design should also meet specific criteria, including the brake system, a system to protect rolling stock from collisions or minimize collision impact, fire protection or control system, and any elements affecting the control movement of rolling stock, such as windscreen wipers, demisters, lights, and anti-glare equipment.

### 3.2.5 **The institutional Framework**

The proposed Railway line is a linear project that intersects the interests of various institutions and falls within a complex administrative framework as detailed in subsequent subsections.

#### 3.2.5.1 *Institutional and Administrative Framework in Tanzania*

The project's scope extends to two regions and seven districts in Tanzania, namely Uvinza, Kigoma Urban and Kigoma rural in the Kigoma Region and Tabora municipal, Uyui, Urambo, Kaliua in Tabora region. Therefore, it operates under the jurisdiction of various Local Government Authorities including Municipal Councils, District Councils, Town Councils, Hamlets ('Kitongoji'), Wards ('Kata') and Villages. These authorities are tasked with ensuring that the interests of local communities are taken into account, including matters related to compensation for affected individuals, protection from environmental pollution, and resolving conflicts related to project implementation.

Regarding the administrative framework for railway development, it falls under the Ministry of Works and Transport, which oversees the coordination of the proposed railway line through the Tanzania Railway Corporation (TRC). The Ministry's responsibilities are further devolved to the Land Transport Regulatory Authority (LATRA).

#### 3.2.5.2 *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:

- i. Promoting effective competition and economic efficiency of regulated sectors;
- ii. Promoting safety of regulated sectors;
- iii. Protecting the interests of consumers in relation to costs, quality, and standards of transport services;
- iv. Protecting the financial viability of efficient suppliers;
- v. Promoting the availability of regulated services to all consumers including low income, rural and disadvantaged consumers; and
- vi. Considering the need to protect and preserve the environment.

#### 3.2.5.3 *Sector Ministries*

According to the current institutional and legal framework, sector ministries are obligated to set up Sector Environmental Sections led by the Sector Environmental Coordinator. These Sections are tasked with coordinating environmental management activities within their respective sectors including:

- i. ensuring environmental compliance by the Sector Ministry;
- ii. ensuring all environmental matters contained in other sector ministries are implemented;
- iii. 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;
- iv. promoting the public awareness of environmental issues through educational programmes and dissemination of information;
- v. undertaking analysis of environmental impact of sectoral legislation, regulation, policies, plans, strategies and programmes through strategic environmental assessment (SEA); and
- vi. overseeing the preparation of and implementation of EIA required for investments in the sector.

#### 3.2.5.4 *The Regional Secretariat*

The Regional Environmental Management Expert, situated within the Regional Administrative Secretary's office, plays a crucial role in coordinating environmental management within their respective regions. Their responsibilities include:

- i. providing guidance to local authorities on the implementation and enforcement of by-laws and Acts; and
- ii. acting as a liaison between the region, the Division of Environment, and the National Environmental Management Council.

#### 3.2.5.5 *The National Environmental Management Council (NEMC)*

The Environmental Management Act of 2004 grants authority to the National Environmental Management Council (NEMC) to oversee the Environmental Impact Assessment (EIA) process, including the screening and approval of ESIA reports. Once the ESIA reports are approved, NEMC, through the Minister responsible for Environment, is mandated to issue an Environmental Certificate. Therefore, NEMC will manage the EIA process for the proposed Tabora - Kigoma railway project.

Additionally, other relevant institutions that will play a role in the project's administrative decisions include the Ministry of Land and Human Settlement for land-related matters, the Ministry of Water for water-related issues, and the Tanzania Forest Agency Services under the Ministry of Natural Resources and Tourism (Forestry Division) for concerns related to forest and forest products. This ESIA report addresses the administrative structure and how the project has facilitated coordination among key decision-makers and stakeholders.

### **3.3 PROJECT IMPLEMENTATION ENTITY – ROLES AND RESPONSIBILITIES**

#### **3.3.1 Introduction**

A well-organized and structured implementation plan is crucial for the successful achievement of the project's objectives. This section provides a detailed description of the roles and responsibilities of the Project Implementation Entity (PIE) responsible for the Tabora Kigoma SGR route. It also highlights the institutional and legal framework that governs the project's implementation, including the roles of various implementation agencies and stakeholders. Additionally, it outlines the legislative and regulatory requirements for the implementation of the Environmental and Social Management Plan (ESMP) for the project.

#### **3.3.2 The Project Implementation Entity (PIE)**

The TRC serves as the primary Project Implementation Entity (PIE) responsible for overseeing the full implementation of the Tabora-Kigoma SGR project. TRC is entrusted with the task of adhering to the Employer's Requirements, which are set by TRC itself as well as complying with national regulations and standards and those of the African Development Bank (AfDB) as the project lender. Additionally, TRC must follow applicable international conventions and standards pertaining to railway construction.

Under the Railway Act of 2017, TRC is granted the authority to carry out railway construction and operation activities in Tanzania. The Act establishes TRC as the governing body responsible for the development, maintenance, and promotion of railway infrastructure, as well as providing rail transport services and managing related matters. The TRC is empowered to undertake tasks such as constructing railway infrastructure and superstructure, acquiring and managing properties and ensuring the safe, well-maintained and sustainable operation of the railway system. The implementation entities include:

- i. **Director General:** The Director General (DG) holds the highest position of authority within TRC and is responsible for overseeing and managing all activities of the organization. As the accounting officer, the DG is held accountable for all aspects of TRC's operations and future plans. To effectively handle these responsibilities, TRC has established a structured management team comprising key personnel responsible for the day-to-day operations. The Directorate of Commercial Investments (DCI) is a crucial division within TRC, entrusted with managing most of the development programs. This department operates under the direct supervision of the Director General, ensuring effective coordination and implementation of TRC's initiatives;
- ii. **The Directorate of Commercial Investments (DCI):** In the Tabora Kigoma SGR project, the responsibility for project implementation will rest with the Directorate of Commercial Investments (DCI). The DCI will be at the forefront, leading and overseeing the entire project. Assisting the DCI in this role, there will be a Project Manager and a Deputy Project Manager. Together, this team will be instrumental in successfully carrying out the implementation of the SGR project;
- iii. **Key Directorates:** Considering the project's complexity and scope, crucial team members, including the Director of Legal Services, Director of Human Resources, and Director of Planning, Finance, and Administration, will also form an integral part of the Project Implementation Entity (PIE). These individuals will play vital roles in ensuring the smooth execution and management of the project, handling legal matters, human resources, and financial planning and administration. Their expertise will contribute significantly to the overall success of the Tabora-Kigoma SGR project;
- iv. **Environment and Social Manager:** This key personnel oversees and manages all aspects of environmental and social compliance, ensuring adherence to both national regulations and the requirements set forth by the project's lenders. Their role involves monitoring and implementing measures to mitigate potential environmental and social impacts, ensuring the project complies with relevant laws, standards, and international conventions. The Environment and Social Manager plays a critical role in promoting sustainability and responsible practices throughout the Tabora-Kigoma SGR project;
- v. **Project Consultant:** The Project Consultant, will act as the representative of TRC at the project level. Their primary responsibilities will include conducting technical reviews and providing suggestions during project implementation. Additionally, they will play a crucial role in approving invoices from the contractor on behalf of TRC, ensuring that payments are in line with the agreed-upon terms and progress of the project. The Project Consultant's expertise and oversight will contribute to the successful execution of the SGR project, drawing from their experience in previous SGR projects and relevant technical knowledge; and
- vi. **Contractor:** The contractor is tasked with the timely and efficient construction of the project, adhering to the directives, specifications, and approvals provided by TRC. Their primary responsibility is to execute the project according to the agreed-upon plans and



deliverables. This includes procuring necessary materials, equipment, and subcontractors required for various aspects of the construction work. The contractor plays a critical role in ensuring that the project is implemented with high standards of quality, safety, and adherence to the project schedule. Effective collaboration and communication between TRC and the contractor are essential for the successful completion of the Tabora-Kigoma SGR project.

### **3.3.3 Institutional and Legal Framework**

The institutional and legal framework for the Tabora-Kigoma SGR project is outlined in the Railway Act of 2017. Tanzania Railways Corporation (TRC) is the main Project Implementation Entity (PIE) responsible for overseeing the project's complete execution, adhering to the requirements set forth by the Employer (TRC), the African Development Bank (AfDB) as the lender, and other applicable international conventions and standards for railway construction.

The Director General (DG) holds the highest authority within TRC and is accountable for all activities and decisions of the organization. Key personnel at the managerial level, including the Director of Legal Services, Director of Human Resources, and Director of Planning, Finance, and Administration, are integral members of the PIE, working alongside the DCI, which takes the lead in most development programs.

The PIE is supported by a Manager for Environment and Social, who oversees environmental and social compliance, both at the national level and in alignment with the lenders' requirements. Additionally, a Project Consultant will be appointed to represent TRC during project implementation, providing technical reviews and approvals on behalf of the organization.

The contractor is responsible for efficient and timely construction, adhering to directives and specifications provided by TRC. Their role also includes procuring necessary materials, equipment, and subcontractors for the project. The TRC must ensure that the contractor and their subcontractors adhere to all relevant national laws, conventions and standards, as outlined in Chapter 2 of the ESIA report, to ensure compliance with policies and regulations for the Tabora Kigoma SGR project.

### **3.3.4 Regulatory Framework for Implementation of ESMP**

According to the Environmental Management Act (EMA) of 2004 and the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations of 2018, any development activity must obtain an environmental certificate from the Minister responsible for Union and the Environment in the Vice President's Office of the United Republic of Tanzania. This requirement necessitates conducting an Environmental Impact Assessment (EIA) for the proposed project. The EIA report is submitted to the National Environment Management Council (NEMC) for review and approval, and upon approval, a certificate is issued to the developer, which, in this case, is Tanzania Railways Corporation.

Both the Act and the Regulations mandate the preparation of an Environmental and ESMP that outlines the management of identified risks and impacts. A monitoring program must also be

established to continuously assess the effectiveness of the measures outlined in the ESMP. Adequate resources must be allocated to ensure the successful implementation of the ESMP.

The responsibility for implementing the ESMP lies with the developer, TRC, with specific roles divided between TRC and the contractor based on the identified impacts. To facilitate this process, the contractor prepares a Contractor ESMP, guiding their activities in implementing the ESMP, and reports back to TRC and/or the lenders, as applicable.

The NEMC is responsible for ensuring compliance with the implementation of the ESMP. They receive annual implementation status reports from TRC to assess the progress. NEMC conducts compliance monitoring and inspections to verify whether TRC, as the Developer, adheres to the directives outlined in the environmental certificate and complies with all relevant national and international conventions ratified by Tanzania.

During the implementation of the ESMP, collaboration with other agencies and stakeholders may be necessary, depending on the specific issues at hand. For example, monitoring of the Biodiversity Action Plan may require the involvement of competent entities such as research or training institutions. Certain parameters, like noise, air quality, vibration, and health-related concerns, might be monitored by other agencies in addition to TRC.

Furthermore, community engagement is essential in the implementation of the ESMP, particularly through compliance monitoring. Engaging communities allows them to provide feedback on whether the project is adhering to prescribed protocols. This involvement, however, relies on whether the community members and other stakeholders were adequately engaged in the ESIA process and had access to the ESIA report. Extensive sensitization, awareness raising and information sharing can bridge this gap and enable active participation from various stakeholders in the implementation of the ESMP.

### 3.4 INTERNATIONAL POLICIES AND GUIDELINES

#### 3.4.1 The African Development Bank Requirements

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

The African Development Bank (AfDB) places great importance on environmental and social safeguards to promote inclusive economic growth and environmental sustainability in Africa. As the Bank faces new challenges in the field of environmental and social development, existing safeguards may need updating. To address this, the Bank has introduced an Integrated Safeguards System (ISS) to articulate its safeguard policies while enhancing clarity, coherence and consistency.

The ISS is built upon various previous policies and safeguards, consolidating them into a comprehensive framework that aims to improve the effectiveness and relevance of the Bank's initiatives. The ISS comprises four interconnected components, which are:

- i. **The Integrated Safeguards Policy Statement** sets forth the overarching goals of the Bank's safeguards and outlines the fundamental policy principles. It is a comprehensive framework that applies to present and future lending approaches and considers the

diverse capacities and requirements of regional member countries, encompassing both the public and private sectors;

- ii. **Operational Safeguards (OSs)** consist of five specific safeguard requirements that Bank clients must adhere to while addressing social and environmental impacts and risks. These requirements are essential for ensuring responsible and sustainable project implementation;
- iii. **Environmental and Social Assessment Procedures (ESAPs)** offer detailed guidance on the specific procedures that the Bank and its borrowers or clients should follow at each stage of the Bank's project cycle to ensure that Bank operations align with the requirements of the Operational Safeguards (OSs). The ESAPs help ensure that social and environmental impacts are effectively assessed and managed throughout the project lifecycle; and
- iv. **The Integrated Environmental and Social Impact Assessment (IESIA) Guidance Notes** offer technical guidance to the Bank's borrowers or clients. They provide standards on sector-specific issues like roads and railways, hydropower, fisheries, and other sectors. These guidance notes also outline the methodological approaches that clients or borrowers should adopt to ensure compliance with the Operational Safeguards (OS) standards.

The AfDB's Operational Safeguards include the following:

- i. **Operational Safeguard 1: Environmental and Social Assessment** - This primary safeguard oversees the procedure of determining the environmental and social category of a project, as well as the associated environmental and social assessment requirements. It ensures that appropriate assessments are conducted to identify potential environmental and social impacts of the project;
- ii. **Operational Safeguard 2: Involuntary Resettlement, Land Acquisition, Population Displacement, and Compensation** - This safeguard combines the Bank's policy on involuntary resettlement and addresses the issues related to land acquisition, population displacement, and compensation. It includes refinements to enhance the operational effectiveness of the requirements, ensuring that affected communities are adequately compensated and supported during the resettlement process;
- iii. **Operational Safeguard 3: Biodiversity and Ecosystem Services** - This safeguard focuses on conserving biological diversity and promoting the sustainable use of natural resources. It aligns with the Bank's policy on integrated water resources management, incorporating operational requirements to ensure the protection and preservation of biodiversity and ecosystem services;
- iv. **Operational Safeguard 4: Pollution Prevention and Control, Hazardous Materials, and Resource Efficiency** - This safeguard addresses the various impacts of pollution, waste, and hazardous materials, taking into account international conventions and industry-specific standards. It also considers greenhouse gas accounting in line with the practices followed by other multilateral development banks. The goal is to ensure effective measures are in place to prevent and control pollution, manage hazardous materials, and promote resource efficiency;

- v. **Operational Safeguard 5: Labor Conditions, Health, and Safety** - This safeguard outlines the Bank's requirements for its borrowers or clients with regard to labor conditions, workers' rights, and protection from abuse or exploitation. It aims to promote safe and healthy working environments and is aligned with the practices followed by most other multilateral development banks. The focus is on ensuring that labor standards are met and that workers are treated fairly and protected from any form of mistreatment or exploitation;

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

The handbook provides comprehensive guidelines and specific actions for AfDB staff to promote stakeholder participation throughout the project cycle, including Country Strategy Papers and Poverty Reduction Strategies. The Handbook explains the concept of stakeholder participation, its various levels, benefits, risks, and underlying principles. It provides an overview of commonly used participatory methods, tools, and techniques, along with insights into institutional and resource implications when integrating participatory approaches in AfDB's work. The Handbook identifies constraints and recommends steps to translate the policy commitment to participation into practical implementation. It also includes Annexes with further resources and references for staff seeking more information on stakeholder engagement.

In the ESIA process for the proposed Project, public and stakeholder consultations were conducted in all the affected districts. The outcomes of these consultations are presented in this report. More detailed information about stakeholders' engagement can be found in Chapter.5 of this report.

#### **3.4.2 Relevant International Conventions and Treaties**

Tanzania has both signed and ratified various international conventions and treaties that bind the country to conserve and protect its biological and environmental resources. In light of the proposed Project, it is essential to review these conventions and treaties to ensure compliance and adherence during the implementation and management of the project.

#### **3.4.3 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 aimed at promoting and safeguarding human rights and fundamental freedoms in Africa. The Charter acknowledges the importance of freedom, equality, justice, and dignity in fulfilling 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.

In light of the Railway line project, it is crucial to consider human rights issues and ensure compliance with the following principles and rights outlined in the African Charter on Human and Peoples' Rights:

*i. 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:

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

In Tanzania, there are several significant wetland areas, including lakes, rivers, marshes, swamps, estuaries, floodplains, mangroves, open coasts, and man-made wetlands. The proposed railway line project will pass through and impact areas with notable rivers, wetlands, and floodplains. Specifically, it will affect the wetland area at Nyamgongo flood plain in Asante Nyerere village and interfere with the Malagarasi flood plain.

These areas are essential sources of water and support a diverse range of living organisms. To protect and preserve these valuable wetlands, the Environmental Impact Assessment (EIA) study proposes prevention, minimization, and mitigation measures. These measures are designed to ensure that the wetlands are not adversely affected by the implementation of the proposed railway project.

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

The objective of this Convention is to promote the identification, safeguarding, and preservation of the world's cultural and natural heritage. It acknowledges the interdependence between nature and culture and the significant impact of the natural environment on cultural identity.

The Convention focuses on safeguarding specific cultural and natural properties that are considered of utmost value to humanity. It does not aim to protect all properties with great significance or importance, but rather a carefully selected list of the most exceptional ones, recognized from an international perspective.

During the implementation of the Project, there is a possibility of discovering cultural and heritage sites. In such cases, appropriate actions and recommendations will be made in accordance with Tanzanian legislation, policies, and international best practices to ensure the responsible handling and preservation of these sites.

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

This Convention is dedicated to safeguarding migratory species and their habitats, making it the only global agreement solely focused on the conservation and management of these species. It extends its concern to wild animals that undertake migrations across or beyond national boundaries.

Although no specific migratory species were identified in the project area, stakeholders mentioned the presence of chimpanzees that migrate through the area. Consequently, it is essential to take this Convention into account during the implementation of the Project. Where relevant, best practices should be followed to ensure the safe and appropriate handling of migratory species of wild animals, including the protection of their habitats.

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

This Convention's primary objective is to regulate the international trade of species of wild animals and plants that are, or may be, at risk of extinction due to such trade. CITES plays a critical role in protecting biodiversity from the threat of invasive species.

The initial activities of the proposed Project will involve identifying the species present in the project area to prevent the introduction of harmful alien species during landscaping and re-vegetation efforts. This measure ensures compliance with CITES regulations and helps safeguard the local ecosystem from potential disruptions caused by invasive species.

**v. *The African Convention on the Conservation of Nature and Natural Resources, 1968***

The core principle of this Convention mandates participating countries to adopt measures that ensure the conservation, responsible utilization, and sustainable development of soil, water, flora, and fauna resources based on scientific principles and in the best interests of the people. Contracting states must implement effective measures to protect and utilize these resources responsibly. Special attention is to be given to protected species, including maintaining their habitats to ensure their survival. The Convention includes two lists of protected species, namely Class A and Class B.

The proposed Project, involving the construction of a railway line which passes through forest reserves and water bodies, such as Mkuti, Lugutu, Ilundu and Masama Forest Reserves in Uvinza District and Gombe Forest Reserve in Kaliua District and the Malagalasi, Ugala and Ruchungi Rivers in Uvinza District and flood plain. Therefore, this Convention should be duly considered during the Project's implementation. Best practices must be followed to ensure the safe and appropriate management of soil, water, flora, and fauna resources in accordance with the Convention's guidelines and regulations. This will help safeguard these important resources and maintain their ecological balance.



### 3.5 INSTITUTIONAL FRAMEWORK: ACTORS IN ENVIRONMENT

**Table 3-1: Relevant Key Institutions in SGR Project-related Environmental Management**

Level	Institution	Role and Responsibility
National	Vice President's Office (Division of Environment)	<ul style="list-style-type: none"> <li>i. Overall responsibility for planning and implementation on all environmental matters;</li> <li>ii. Responsible for articulation of policy guidelines necessary for promotion and protection;</li> <li>iii. Issue general guidelines to sector Ministries and coordinate all agencies public/private institutions related to environmental management;</li> <li>iv. Facilitate civil society involvement;</li> <li>v. Advise the GoT on legislative measures related to management of environment and on international agreements in the field of environment;</li> <li>vi. Monitor and assess activities being carried out by relevant agencies to ensure that the environment is not degraded;</li> <li>vii. Prepare and issue a report on the state of the environment; and</li> <li>viii. Coordinate issues relating to articulation and implementation of environmental management aspects of other sector policies.</li> </ul>
	Ministry of Energy	<ul style="list-style-type: none"> <li>i. Enforcer of the national energy policy;</li> <li>ii. Propose various renewable and non-renewable power sources;</li> <li>iii. Monitor application of the electricity Act;</li> <li>iv. Monitor the project execution; and</li> <li>v. Ensure environmental concerns are considered during execution of the energy related projects.</li> </ul>



Level	Institution	Role and Responsibility
	Ministry of Transport	<ul style="list-style-type: none"> <li>i. Oversee implementation of the Transportation Policy;</li> <li>ii. Enforcement of laws and regulations for transport and protection of environment; and</li> <li>iii. Environmental monitoring and auditing</li> </ul>
	Ministry of Water	<ul style="list-style-type: none"> <li>i. Enforce laws and regulations for water quality and utilization;</li> <li>ii. Issuance and regulation of water rights;</li> <li>iii. Enforce water and effluent discharge laws (standards, monitoring and regulation); and</li> <li>iv. Issuance of permits for construction of water dams, and permits for effluent discharge.</li> </ul>
	Ministry of Lands, Housing and Human Settlements Development	<ul style="list-style-type: none"> <li>i. Land use planning; and</li> <li>ii. Valuation and compensation.</li> </ul>
	Ministry of Natural Resources and Tourism (Forestry and Beekeeping Division)	<ul style="list-style-type: none"> <li>i. Implementation of the Forestry Policy;</li> <li>ii. Enforcement of laws and regulations for forestry resources management;</li> <li>iii. Issuance of permits for exploitation of forest resources; and</li> <li>iv. Issuance of permits to conduct activities in the forest reserve areas.</li> </ul>
	National Environment Management Council (NEMC)	<ul style="list-style-type: none"> <li>i. Carry on environmental audit as provided under the EMA;</li> <li>ii. Carry out surveys which will assist in the proper management and conservation of the environment;</li> <li>iii. Undertake and coordinate research, investigation and surveys in the field of environment and collect, and disseminate information about the findings of such research, investigation or survey;</li> </ul>

Level	Institution	Role and Responsibility
		<ul style="list-style-type: none"> <li>iv. Review and recommend for approval of environment impact statements;</li> <li>v. Identify projects and programmes or types of projects and programmes, for which environmental audit or environmental monitoring must be conducted under EMA;</li> <li>vi. Enforce and ensure compliance of the national environmental quality standards;</li> <li>vii. Initiate and evolve procedures and safeguards for the prevention of accidents which may cause environmental degradation and evolve remedial measures where accidents occur;</li> <li>viii. Undertake, in cooperation with relevant sector Ministries, programmes to enhance environmental education and awareness about the need for sound environmental management;</li> <li>ix. Publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation; and</li> <li>x. Render advice and technical support, where possible, to entities engaged in natural resources and environmental management to enable them to carry out their responsibilities.</li> </ul>
	National Environmental Advisory Committee	<ul style="list-style-type: none"> <li>i. Examine any matter, which may be referred to it by the Minister or any sector Ministry relating to the protection and management of the environment;</li> <li>ii. Make recommendations to the Minister where there is degradation of the environment;</li> <li>iii. Receive and deliberate on reports from sector ministries on the protection and management of the environment; and</li> <li>iv. Review and advise on any environmental standards, guidelines and regulations that are to be made pursuant to the provisions of the Act.</li> </ul>
	Regional Secretariat	<ul style="list-style-type: none"> <li>i. Responsible for coordination of all advice on environmental management in their respective regions and liaison;</li> </ul>

Level	Institution	Role and Responsibility
Regional-Tabora and Kigoma Region		<ul style="list-style-type: none"> <li>ii. Responsible for advising the local authorities on matters relating to implementation and enforcement of the Act; and</li> <li>iii. Link between the Region and Director of Environment as well as Director General.</li> </ul>
City, Municipal, District, Township, Ward, Mtaa/ Village and Hamlet.	Environmental Management Committees	<ul style="list-style-type: none"> <li>i. Initiate inquiries and investigations about any allegation related to the environment and the implementation or violation of the provisions of this Act;</li> <li>ii. Require any person to provide information or explanation about any matter related to the environment;</li> <li>iii. Resolve conflict among individual persons, companies, agencies, non-governmental organisations, government departments or institutions about their respective functions, duties mandates, obligations or activities under this Act;</li> <li>iv. Inspect and examine any premises, street, vehicle, aircraft or any other place or article which it believes or have reasonable cause to believe that pollutant or other articles or substances believed to be pollutants are kept or transported;</li> <li>v. Require any person to remove at own cost any article or substance from any place which it believes such article or substance may be safely kept or destroyed without causing harm to health; and</li> <li>vi. Initiate proceedings of civil or criminal nature against any person, company, agency, department or institution that fails or refuses to comply with any directive issued by any of such Committees.</li> </ul>
	Land Allocation Committee	Land allocation and approvals

Level	Institution	Role and Responsibility
District / Local	District/Ward Functional Departments – Planning, Water, Health, Community Development, Natural Resources, etc.	<ul style="list-style-type: none"> <li>i. Advise committees and departments on environmental matters;</li> <li>ii. Promote environmental awareness;</li> <li>iii. Gather and manage information on environment and the utilisation of resources;</li> <li>iv. Prepare periodic reports on the state of the environment;</li> <li>v. Monitor the preparation, review, and approval of ESIA of local investments;</li> <li>vi. Review by-laws on environmental management and on sector specific activities; and related to the environment.</li> </ul>
	Environmental Committees (District, Ward and Village)	<ul style="list-style-type: none"> <li>i. Coordinate and advise on environmental policies and implementation obstacles;</li> <li>ii. Promote environmental awareness;</li> <li>iii. Information generation, assembly and dissemination from any person;</li> <li>iv. Initiate inquiries and investigation on any environmental disputes or violation of the Act;</li> <li>v. Resolve conflicts among individual persons, companies, agencies, NGOs, Government Departments;</li> <li>vi. Inspect any source of pollution in the area; and</li> <li>vii. Initiate proceedings of civil nature against any person, company, and agency for failing or refusing action under the Act.</li> </ul>
	Councils (District, Ward and Village)	To oversee performance of the Environmental Committees (within their jurisdictions).

## **3.6 INTERNATIONAL CONVENTIONS AND AGREEMENTS**

### **3.6.1 Universal Declaration of Human Rights**

The Universal Declaration of Human Rights (UDHR) was the first document that set out the fundamental human rights to be universally protected and was adopted by the United Nations (UN) General Assembly in 1948. The UDHR together with the International Covenant for Civil and Political Rights (UN, adopted 1966) and the International Covenant for Economic, Social and Cultural Rights (UN, adopted 1966) make up the International Bill of Human Rights. The UDHR consist of a set of thirty articles.

Businesses can impact on virtually all human rights, and when exercising human rights due diligence, businesses are required to consider at a minimum the rights captured in the International Bill of Human Rights and the International Labour Organisation's eight core conventions that are outlined in the Declaration of Fundamental Principles and Rights at Work (adopted 1988).

The SGR project has developed a Human Rights Policy (2023) that applies to all its entities and will also be relevant to the Project.

### **3.6.2 United Nations Framework Convention on Climate Change**

The objective of the UN Framework Convention on Climatic Change (UNFCCC, 1992) is to stabilise the concentration of greenhouse gas (GHG) in the atmosphere, at a level that would prevent dangerous anthropogenic interference with the climate system. Article 4 commits parties to develop, periodically update, publish and make available national inventories of anthropogenic emissions of all GHGs not controlled by the Montreal Protocol (by source) and inventories of their removal by sinks, using agreed methodologies. Tanzania ratified the UNFCCC on 17 April 1996 and produced a National Adaptation Programme of Action in 2007.

#### **3.6.2.1 *Kyoto Protocol***

The Kyoto Protocol is overseen by the UNFCCC and is an international treaty among industrialised nations that sets mandatory limits on GHG emissions. It was adopted in 1997, but only entered into force in February 2005. The purpose of the Kyoto Protocol is to even out human-generated emissions at a level that will not inflict further harm on the atmosphere. There are currently 192 Parties to the Protocol.

The UNFCCC (also referred to as 'the Convention') divides countries into three main groups. They are Annex 1 countries which include industrialised countries; Annex 2 countries developed countries that provide financial support for developing countries to undertake emission reduction projects; and Non-Annex 1 countries that are developing countries and do not have specific emission restraints. The mentioned Annexies can be found in the Kyoto Protocol. The GHGs included in the Kyoto Protocol are:

- i. Carbon dioxide (CO<sub>2</sub>);
- ii. Methane (CH<sub>4</sub>);
- iii. Nitrous oxide (N<sub>2</sub>O);

- iv. Hydrofluorocarbons (HFCs);
- v. Perfluorocarbons (PFCs); and
- vi. Sulfur hexafluoride (SF<sub>6</sub>).

Tanzania ratified the Kyoto Protocol on 26 August 2002.

#### 3.6.2.2 *Paris Agreement (21<sup>st</sup> Conference of Parties)*

An historic agreement to combat climate change towards a low carbon, resilient and sustainable future was agreed by 165 nations in Paris in December 2015. The 21st Conference of Parties (COP21) also referred to as the Paris Agreement confirms the irreversible transition to a low carbon, safer and healthier world.

The COP21 Paris Agreement's main aim is to keep the global temperature rise this century well below 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius (above pre- industrial levels). All countries to set mitigation targets from 2020 and review targets every five years to build ambition over time, informed by a global stocktake. The Paris agreement calls for transparency and accountability rules to provide confidence in countries' actions progress towards targets. In addition, adapting and building resilience to climate change is a key outcome.

Tanzania signed the Paris agreement on 22 April 2016 and ratified the agreement on 18 May 2018. Tanzania provided their first Nationally Determined Contributions on 30 July 2021.

Tanzania's Nationally Determined Contributions is in line with the Tanzania Development Vision (2025) and Zanzibar Development Vision (2050), and the Third Five-Year Development Plan (FYDP III). It is also anchored in the National Climate Change Response Strategy (2021) and the Zanzibar Climate Change Strategy (2014)

The 2021 Nationally Determined Contributions report identified its priority mitigation sectors as energy, transport, forestry, and waste, and proposed the following actions to improve energy generation and distribution:

- i. Exploring options for improved clean power interconnection with neighbouring countries;
- ii. Promoting clean technologies for power generation and diverse renewable sources such as geothermal, wind, hydro, solar and bioenergy; and
- iii. Promoting climate-smart rural electrification, including development of micro and mini-grid renewable generation for improved rural electrification.

#### 3.6.2.3 *26<sup>th</sup> Conference of Parties (COP26)*

The COP26 reached consensus on key actions to address climate change, most notably, the pending items that prevented the full implementation of the Paris Agreement on carbon markets and transparency were approved. An agreement was reached on the fundamental norms related to Article 6 on carbon markets, which will make the Paris Agreement fully operational. This will give certainty and predictability to both market and non-market approaches in support of mitigation as well as adaptation. In addition, adaptation was emphasised during the

deliberations. Parties established a work programme to define the global goal on adaptation, which will identify collective needs and solutions to the climate crisis already affecting many countries (UNFCCC, 2021).

The COP26 considers Scope 3 interventions as a critical aspect in reducing carbon equivalent emissions. Tanzania called upon developed countries to unlock climate change financing to boost Tanzania's capacity to address climate change.

As mentioned in Section 3.6.2.1, a GHG assessment for the Project was completed in 2022. This GHG assessment focusses on Scope 1 and Scope 2 and will be updated on an annual basis as part of SGR project's sustainability reporting.

### **3.6.3 Sustainable Development Goals (SDGs)**

In 2015, the same year that the Paris Agreement was signed, the 2030 Agenda for Sustainable Development was adopted, along with a set of 17 Sustainable Development Goals (SDGs) which will guide policy and funding for the next decade. The SDGs speak to eradicating poverty and reducing inequalities. Climate change has the potential to affect all aspects of sustainable development. Climate action is therefore essential for achievement of the SDGs. The SDGs support the Paris Agreement as climate change is specifically highlighted under SDG 13 which mentions targets relating to strengthening resilience and adaptive capacity.

Tanzania adopted the SDGs which are implemented through the National Five-Year Development Plan 2016/17 - 2020/21 in the Mainland and the Zanzibar Strategy for Growth and Reduction of Poverty 2016-2020 (URT, 2019). Tanzania released its Voluntary National Review on progress measured against the SDGs in 2019.

Consistent with industry practice, SGR intends to report on its contribution to the SDGs in future sustainability reporting.

### **3.6.4 The Convention on Wetlands of International Importance (RAMSAR Convention)**

The Ramsar Convention is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their wetlands of international importance and to plan for the sustainable use of all of the wetlands in their territories. Unlike the other global environmental conventions, Ramsar is not affiliated with the United Nations system of Multilateral Environmental Agreements, but works very closely with the other multilateral environmental agreements and is a full partner among the 'biodiversity-related cluster' of treaties and agreements. The convention entered into force in Tanzania on 13 August 2000. There are four Ramsar sites in Tanzania but none are in proximity to the Project.

### **3.6.5 Lusaka Agreement 1994**

The Lusaka agreement details co-operative enforcement operations directed at illegal trade in wild fauna and flora. The objective of this agreement is to reduce and ultimately eliminate illegal trade in wild fauna and flora and to establish a permanent task force for this purpose. The SGR project will prohibit its workforce to trap wildlife and collect flora from the area and illegally trade these.

### **3.6.6 The Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal**

The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal first came into force in 1992. The Convention puts an onus on exporting countries to ensure that hazardous wastes are managed in an environmentally sound manner in the country of import.

One hundred and fifty-one (151) countries have ratified the Basel Convention as of December 2002. These obligations are to:

- i. Minimise generation of hazardous waste;
- ii. Ensure adequate disposal facilities are available;
- iii. Control and reduce international movements of hazardous waste;
- iv. Ensure environmentally sound management of wastes; and
- v. Prevent and punish illegal traffic.

Although the Project will likely produce hazardous wastes, it is not its intention to export these wastes. Waste will be managed on site and disposed of responsibly as per the management measures that will be described in the detailed ESMP.

### **3.6.7 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade**

This refers to the prior informed consent procedure, applicable to a certain pesticides and hazardous chemicals, in international trade. In addition to the notification from exporters to importers during trade and the dissemination of regulatory actions taken by countries regarding products, it seeks to facilitate the exchange of precise information on the characteristics of chemicals. SGR does not intend to use any chemicals listed in Appendix III of the prior informed consent circular of Rotterdam Convention.

### **3.6.8 Stockholm Convention on Persistent Organic Pollutants**

The convention entered into force in 2004 and its goal is to reduce and, if possible, completely eliminate persistent organic pollutants over time. The SGR does not intend to use any persistent organic pollutants in its operations.

### **3.6.9 Other International Guidelines**

#### **3.6.9.1 *Globally Harmonized System of Classification and Labelling of Chemicals (Rev 9) 2021***

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is a set of international guidelines that were developed by the UN. These guidelines were created to ensure the safe manufacturing, handling, use, disposal, and transport of hazardous materials. The guidelines address the classification of chemicals by types of hazards and proposes harmonised hazard communication elements, including labels and safety data sheets. It aims to ensure that information on physical hazards and toxicity from chemicals is available to enhance the protection of human health and the environment during the handling, transport and use of



these chemicals. The GHS also provides a basis for harmonisation of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation.

The SGR will ensure that labelling of hazardous materials is undertaken in compliance with both Tanzanian standards and the GHS.

## **4 BIOPHYSICAL, SOCIAL-ECONOMIC AND CULTURAL BASELINE CONDITIONS OF THE STUDY AREA.**

### **4.1 4.1 Introduction**

This chapter provides a description of the existing environmental, social and economic baseline conditions of the core project area (Tabora, Uyui, Urambo Uvinza, Kasulu, Kigoma Urban and Kigoma rural districts) taking a total of 34 Wards and 62 Villages. The objective of this chapter is to document the necessary information relating to environmental and social-economic aspect as described in subsequent sections.

In order to collect data/information relevant for the this ESIA report, the study approaches included: relevant literature review on issues related to the project, visual inspection, observations, measurements, consultations with selected stakeholders, Key Informative Interview (KII) with traditional healers and expert's opinion on the various issues

### **4.2 PHYSICAL ENVIRONMENT**

#### **4.2.1 Geology and climatic conditions**

The proposed railway line project will traverse through various topographical, geographic, soil, climate, hydrological, vegetation, and environmental features from Tabora and Kigoma. The classifications of these environmental characteristics are described broadly, focusing on the most distinctive and important aspects at the regional to district levels.

##### **4.2.1.1 Kigoma Topographic Features**

The Kigoma area is a gently sloping plateau with high hills that rise abruptly from 800 meters at Lake Tanganyika's level to 1,750 meters to the east, dropping into gently rolling hills with three significant 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, Kigoma rural and Kigoma urban. 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. (Source: *Kigoma Socio economic profile, 2022*)

#### 4.2.1.2 *4.2.1.2 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.

Geologically the Kigoma region falls under the Manyovu red beds as a regional geological.

### **4.3 THE PROJECT AREA GEOLOGY**

#### **4.3.1 Kigoma 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.

#### **4.3.2 Tabora Geology and soil**

Tabora Region is located on the central plateau of at the latitude between 4 and 7 degrees south of the equator. Majority of the region's land area is between 1000m to 1500 m above sea-level. Tabora Region has an area of 76,151 square kilometers (29,402 sq mi), the region is slightly larger than the Central American country of Panama (75,417 square kilometers (29,119 sq mi)). Therefore, with its 76,151-square-kilometre (29,402 sq mi) size, Tabora Region is Tanzania's largest region by area.

Tabora Region is in the central-western part of the country. The highest point in Tabora Region is Wumbo peak at 1395m located in eastern Sikonge District. The most prominent mountain is Mount Kizuge located in northern Tabora in Nzega District.

The longest river in Tabora Region is the Ugalla River which feeds in to the lake Tanganyika drainage basin. Other major rivers in Tabora territory are the Malagarasi River which forms the western border with Kigoma Region, in the north is the Wembere River and in the north is the Gombe River. Another prominent river is the Manonga River which drains east into Lake Eyasi in Arusha Region. However, most of rivers in Tabora dry up during the dry season. The Malagarasi swamp is the largest Swamp in Tabora Region and one of the largest in Tanzania. Tabora borders a small eastern part of Lake Sagara.

## **4.4 CLIMATE AND TOPOGRAPHY**

### **4.4.1 Tabora Climate and Topography**

Tabora Region has a tropical savanna climate with the Köppen climate classification of Aw. The total average annual precipitation in Western Tabora is 1010mm. While its 700mm or less in east Tabora towards the Singida border. The daily mean temperature is 23 degrees Celsius.

#### **4.4.1.1 *The specific Topography and climatic conditions along the proposed railway line;***

##### **(i) Tabora urban climate**

###### *Temperature:*

Tabora Municipal Council has a mean temperature which ranges from 22°C to 26°C. Highest temperature occurs in October prior to the start of rainy season and falls gradually in December and remains relatively constant until May. Between May and August temperatures are at the lowest levels.

###### *Rainfall:*

Average annual rainfall is between 800mm and 1000mm per year. The rains starts at mid-November and end at early May. Normally there is usually a long dry spell towards the end of January or early February every year.

##### **(ii) Urambo climate**

###### *Temperature*

The temperature ranges from 21 – 33°C and highest temperature is experienced between August and October just before the start of rainfall. Temperature gradually falls in December, and then remains relatively constant up to May. From May to August the district experiences low temperatures.

###### *Rainfall*

The district receives rainfall of between 600mm and 1,000mm annually, falling between the months of October or November and December and a dry season from January to February or March and a second lower peak occurs in February or March and the rains then tail off in April or sometimes May.

##### **(iii) Kaliua climate**

#### *Temperature*

The temperature ranges from 21 – 33<sup>0</sup>C and highest temperature is experienced between August and October just before the start of rainfall. Temperature gradually falls in December, and then remains relatively constant up to May. From May to August the district experiences low temperatures.

#### *Rainfall*

The district receives rainfall of between 900mm and 1,300mm annually, falling between the months of October or November and December and a dry season from January to February or March and a second lower peak occurs in February or March and the rains then tail off in April or sometimes May.

#### **(iv) Uvinza climate**

##### *Temperature*

The maximum temperature is between 29°C and 32°C while the minimum is between 23°C and 28°C. During cold season in June, July and August, the temperature goes down to 15<sup>0</sup>C, especially in the Northern part of Uvinza District.

##### *Rainfall*

Rainfall pattern in the District ranges from 1,000 mm to 1,700 mm, in February – May and October – December.

#### **4.4.1.2 Topography and Anglo- ecological zones**

The topography of the project area varying in altitude, terrain and Features at the District of Tabora, Urambo, Uyui and Kaliua Districts in Tabora Region.

Uvinza District topography is composed of High lands, lake shore and low land. At the high land, the altitude ranges between 1500m and 2,462m above sea level whereas the low land altitude ranges from 900 to 1500m above sea level. The lake shore lies between Southern Hill strips and Lake Tanganyika Shores with an altitude range from 800 to 1700m above sea level.

Urambo District forms part of the vast central plateau of Tabora region, an area of flat and gently undulating plains broken in places by small hills. Most parts of the district lie between 800 meters and 1,800 meters above sea level. Likewise, Kaliua District forms part of the vast central plateau of Tabora region, an area of flat and gently undulating plains broken in places by small hills. Most parts of the district lie between 800 meters and 1,800 meters above sea level.

Kaliua District has two distinctive agro-ecological zones, namely, the High Rainfall Zone and the Low Rainfall Zone. The High Rainfall zones covers western and southern parts of the district and parts of Ugunga, Ushokola wards and the Low Rainfall Zone lies in the central, northeast and southeast part of Kaliua District and is covered with alluvial soils. It covers Kaliua, Mwongozo, Kazaroho and Kanindo wards. The zone has low rainfall of between 600 mm and

1,000 mm even though crops such as maize, millet, sunflower, sorghum, cassava, mangoes, beans, groundnuts are grown. Groundnuts, cotton, tobacco and paddy are grown as the major cash crops. A cattle rearing is practiced in this zone as it is a 100 percent tsetse-free area.

Like other Districts Urambo has two distinctive agro-ecological zones, namely, the High Rainfall Zone and the Low Rainfall Zone in which the High Rainfall Zone covers western and southern parts of the district and parts of Vumilia ward. The terrain of the zone is low lying soil necessary for successful paddy cultivation and has been the paddy producing area of the district. Large parts of this zone have good tobacco potential, while the north is suitable for cotton. Soils are sandy loam and alluvial. And the Low Rainfall Zone lies in the central, northeast and southeast part of Urambo District and is covered with alluvial soils. It covers Usisya and Itundu wards. The zone has low rainfall of between 600 mm and 1,000 mm even though crops such as maize, millet, sunflower, sorghum, cassava, mangoes, beans, groundnuts are grown. Groundnuts, cotton, tobacco and paddy are grown as the major cash crops. Cattle's rearing is practiced in this zone as it is a 100 percent tsetse-free area. (Source: Urambo District Council Social and Economic Profile 2013).

Uyui district topography forms part of the vast central plateau of Tabora region, an area of flat and gently undulating plains broken in places by prominent hills. Most parts of the district lie between 1,100 meters and 1,200 meters above sea level and form the main watershed separating rivers flowing north eastward into the Manonga River and the Wembere. (Source: Uyui District Council Social and Economic Profile 2020)

Kigoma region topography is a gently inclined plateau with steep hills rising very sharply from 800 m above sea level along Lake Tanganyika to an altitude of 1,750 m above sea level to the East. The landscape descends from the North and East along the gently rolling hills with three types of major perennial rivers of Malagarasi, Luiche and Ruchungi. (Source: Kigoma region socio economic profile, 2022). There are four (4) major agro ecological zones in Kigoma Region based on altitude and corresponding annual rainfall, which can be described as follows: -

- i. **The Lake Tanganyika Shore Zone** This zone lies within the altitude of 800 – 1000 meters with annual rainfall of 600 – 1000 mm. The lake zone shore forms a narrow strip of land between Lake Tanganyika and the block of mountains dissected by numerous rivers and streams flowing into lake creating in the process valleys in a few locations, which is potential and support paddy farming. Cassava, maize, beans and oil palm are also grown.
- ii. **The Intermediate Zone** This zone covers parts of Kigoma rural, Kasulu and Kibondo district councils. The zone lies between 1200 – 1500 meters above sea level with annual rainfall between 1000 – 1200 mm. The zone is characterized by valleys and swampy areas, which provide great potential for irrigation
- iii. **The Miombo Zone** The Miombo zone lies within altitude 1000 – 1200 meters with rainfall of 600 – 1000 mm. The zone is found in the district councils of Kigoma Rural and Kasulu generally covered with Miombo woodland and is sparsely populated due to tsetse fly infestation and lack of broad economic activities. The soil is a heavy dark reddish clay

loam with internal drainage. Economic activities include cattle rearing, hunting and honey/beeswax gathering with agriculture. The main crops grown in this area are maize, beans, palm oil production in the valleys, banana and groundnuts.

- iv. **The Highland Zone** The zone lies within the altitude of 1,500 to 1,750 metres with annual rainfall of 1,000 – 1,200 mm. The zone is divided into two main parts. In the north, the zone is located above the intermediate zone and has a high population density. In the South, there is a separate highland area and the Mahale Mountains reaching a maximum altitude of 2,373 meters. The area is uninhabited and most of it has been designated as a National Park. Another National Park is the Gombe stream situated North of Kigoma town, famous for tourist attraction due to the existence of the chimpanzees.

## 4.5 QUANTIFICATION OF AIR QUALITY, NOISE LEVEL AND VIBRATIONS

### 4.5.1 Air Quality monitoring

The SGR Lot 6 alignment crosses Tabora and Kigoma regions. Air quality of the Project Area is anticipated to be influenced by pollutants from existing stationary sources, fugitive /mobile sources, motorcycles, birds, insects, earth road, open burning, human activities and small combustion facilities. Existing stationary sources of air pollutants include small scale stone quarry and tobacco preparation and burning at Tabora.

Air quality monitoring was carried within the project area. During construction phase, Operation phase there will be significant environmental issues related to air quality management, particularly regarding dust emissions around the project area and pollutant gaseous.

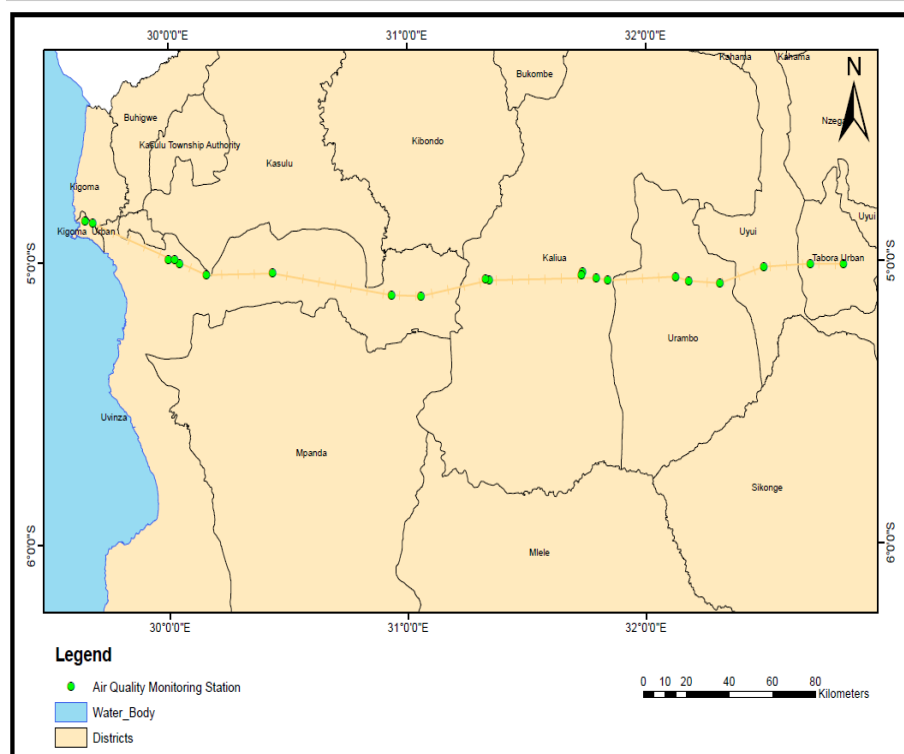
During the construction phase and operation phase of SGR LOT 6 Tabora-Kigoma, the main expected sources of air quality impact can include:

- a) **Dust and Particulate Matter:** Mining activities, such as drilling, blasting, excavation, and transportation of sand and waste soil materials, can generate dust and particulate matter. These particles can become suspended in the air and cause air pollution, leading to respiratory issues and reduced air quality in the surrounding areas.
- b) **Vehicle Emissions:** The construction and operation phase of SGR Lot 6 will involve the use of heavy machinery, trucks, and other vehicles for transportation and material handling. The emissions from these vehicles, including exhaust gases containing pollutants such as nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), Carbon oxides (CO<sub>x</sub>), Ozone (O<sub>3</sub>) and particulate matter, can contribute to air pollution.
- c) **Fugitive Emissions:** Various processes in this project, such as ore crushing, grinding, and material handling, can result in fugitive emissions of dust and particulate matter. These emissions can occur from uncovered stockpiles, conveyor belts, and other equipment, especially if proper dust control measures are not in place.

- d) Fuel Combustion: During the operation phase, the use of diesel generators, boilers, and other equipment powered by fossil fuels can release pollutants into the air when the fuel is burned. Emissions from combustion, including carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>) and Volatile Organic Compound (VOC) can degrade air quality.

#### 4.5.2 Location of monitoring points

The Figure 4-1 hereunder shows the identified and location of the monitoring points for both air quality, noise and vibration in the project area.



**Figure 4-1: Location of monitoring points for air quality, noise and vibration**

(Source: PaulSam Geo-Engineering Site Visit, 2023)

**Table 4-1: IFC/WHO Air quality standards**



Air quality, measurements were conducted at five locations, The collected data was compared

IFC/WHO AIR QUALITY STANDARD		
Dust and Gaseous Parameters	Averaging Period	Guideline value in $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO <sub>2</sub> )	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO <sub>2</sub> )	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM <sub>10</sub>	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100(Interimtarget-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM <sub>2.5</sub>	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

against the air quality standards set by Tanzania and the World Health Organization (WHO/IFC).

(Source: IFC EHS Guidelines)

The ambient air quality measurements revealed various parameters that were analyzed and summarized below, which provides an overview of fugitive dust levels. And levels of gaseous emissions measured in the ambient environment at various locations before commence of project activities.

Ambient Air Quality Monitoring was carried out for Five locations within the project influence area for the parameters PM<sub>2.5</sub>, PM<sub>10</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub>. Samples were collected as per the requirement of standard limit used.

Dust-particulate matters emission concentration was determined using potable Air Quality Gas Monitor Aeroqual Series 500. This monitor was used for measuring particulate matters (PM<sub>2.5</sub>

and PM10) in the air. It is the digital signal processing, light mechanical and electrical integration of high-tech products.

#### **4.5.3 Methodology followed in Sampling and Analysis**

To make sure they are representative of the entire project area, the places and locations that have been picked for the sampling have undergone thorough selection. To accurately comprehend the current state of the ecosystem and the prospective effects of the proposed project, this is essential. The sampling and monitoring activities were conducted at stations and sensitive receptors, which refers to specific locations where the potential for environmental impact is higher or where vulnerable populations reside. In order to capture the overall air quality in the area, sampling point was taken at every station and several receptors in 500m away from the SGR center line. This approach helps in obtaining a comprehensive assessment of the air quality across the project area.

The Tanzania Environmental Management (Air Quality Standards) Regulations, 2007, which provide detailed instructions for evaluating and regulating air quality, served as a guide for choosing sampling locations. Additionally, in order to make sure that the monitoring activities comply with international standards, the World Health Organization (WHO) air quality criteria were also taken into consideration. To determine the optimal locations for monitoring stations, a preliminary analysis of meteorological conditions was conducted. This analysis focused on factors such as predominant and frequent wind directions, as these play a significant role in the dispersion of air pollutants. By strategically placing the monitoring stations in areas that are likely to be influenced by the prevailing wind patterns, a more accurate representation of air quality across the project area can be achieved. When deciding where to place monitoring stations, logistical factors were also taken into account. To make sure that the stations can be easily visited by the monitoring team for routine maintenance and data collection, factors including accessibility and security were assessed. To keep the monitoring process dependable and efficient, this is crucial. The sample and monitoring efforts provide important insights into the current air quality conditions and prospective impacts of the proposed project by adhering to these rigorous selection and placement criteria. The implementation of suitable steps to mitigate any negative effects on the environment and public health as well as successful environmental management depend on this knowledge. The locations of the ambient air quality monitoring stations in the project area are presented in the plate 4-1.



**Plate 4-1: Measuring of air quality**

#### 4.5.4 Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters:

- Particulate Matter (PM 10)
- Particulate Matter (PM 2.5)
- Sulphur Dioxide (SO<sub>2</sub>)
- Oxides of Nitrogen (NO<sub>x</sub>)
- Carbon Monoxide (CO)

**Table 4-2: Methodology for Ambient Air Quality Monitoring**

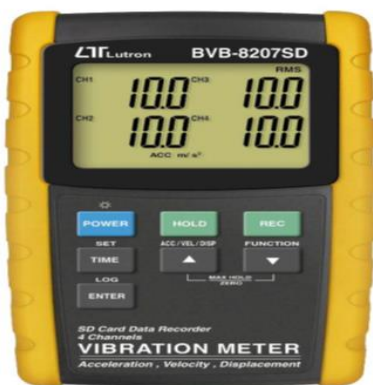
Parameter	Measurement Methods	As Per
PM <sub>10</sub>	Gravimetric	TZS 837, Part 7:
PM 2.5	Gravimetric	TZS 837, Part 7:
SO <sub>2</sub>	Colorimetric (EPA modified West & Gaeke Method)	TZS 837 Parts (1, 2, and 4).
NO <sub>x</sub>	Colorimetric (Arsenite modified Jacobs & Hochheiser Method)	TZS 837 Part 1, 2, and 5
CO	Non-Dispersive Infra-Red (NDIR) Spectroscopy Technique	TZS 837 Parts 1,2, and 6

**Table 4-3: Tools for Air quality measurement and their parameters**

S/n	Name	Tool	Parameters
1.	The 3M™ EVM 7 Environmental Monitor Kit		Sulphur dioxide (SO <sub>2</sub> ) and Oxides of Nitrogen (NO <sub>x</sub> )
2.	Series 500 Portable Air Quality Monitor		Sulphur dioxide (SO <sub>2</sub> ) and Oxides of Nitrogen (NO <sub>x</sub> ) and other gases Particulate Matter (PM10 and PM2.5)
3.	M 2000C		Particulate Matter (PM10 and PM2.5)

4.	Temtop PMD351 Portable Cleanroom Particle Counters		PM1.0, PM4.0, PM10 and TSP mass concentrations.
5.	Gas Analyzer E-instrument		Sulphur dioxide (SO <sub>2</sub> ) and Oxides of Nitrogen (NO <sub>x</sub> ) and other gases CO, CO <sub>2</sub> etc

(Source: PaulSam Geo-Engineering Site Visit, 2023)



**Plate 4-2: Vibration meter and Sound level meter**

The study for air quality was conducted from 15th to 22th July, 2023 during dry season. The baseline conditions collected include PM2.5, PM10, NOx, SOx, COx and VOC. The 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.

Following the long stretch of the SGR Lot 6 of 400km the air quality, noise and vibrations measurement and analysis was carried out at three different sections with different equipment. The sections include;

- i. Tabora rural and Urambo district;
- ii. Kaliua and Uvinza district and;
- iii. Kigoma rural, Kigoma urban and Uvinza district.

#### 4.5.5 Observed baseline air quality conditions

Six (6) significant air quality pollutants have baseline amounts that were noted during the study along SGR lot 6. These include NOx (nitrogen oxide), COx (carbon monoxide), SOx (sulfur dioxide), PM2.5, PM10, VOCs (volatile organic compounds), and O3 (ozone). The complex mixture of particulate matter (PM) in urban and rural environments contains constituents with a range of chemical and physical properties. 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 (PM2.5).

##### a) Particulate Matter (PM10, PM2.5)

Table 4-4 and Table 4-5 provides 24 hours averaging particulate matter for PM10 and PM2.5 baseline concentrations at various monitoring points. The PM10 baseline concentrations ranges between 26.8 µg/m<sup>3</sup> (at Rcpt 2: Lugongoni primary school) and 261.2 µg/m<sup>3</sup> (at Rcpt-1: Unyanyembe TPDF School, Moravian Church). About 30% of the measured baseline concentrations were in compliance with WHO Air Quality Guidelines (2021) threshold of 45 µg/m<sup>3</sup> and the Tanzania standard TZS 845: 2019 threshold of 50 µg/m<sup>3</sup>. The noncompliant monitoring points is due to the presence of small stone quarry, blowing wing, human activities around and burning fire during dry season.

The average PM2.5 ranged between 12 µg/m<sup>3</sup> at Rcpt-2 Lugongoni primary school and 71.3 µg/m<sup>3</sup> at Rcpt -2 Kaliua market. For the PM2.5 it is approximately 37% compliant with Tanzanian standard TZS 845: 2019 and WHO Air Quality Guidelines (2021) in the table 4.5. The high PM10 and PM2.5 concentrations at monitoring is mainly due to the bare land and high

wind blow during monitoring period. Overall, the monitoring results shed light on the air quality situation within the project area during the specified period. The identified issues, particularly

related to dust emissions, emphasize the need for effective air quality management strategies. These findings can guide the implementation of appropriate mitigation measures to ensure compliance with air quality standards and minimize the potential environmental impact of the construction activities.

**Table 4-4: The data for Dust measured using PM 10 at the project site and the recommended WHO and TBS standards in (mg/m3)**

Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		PM10		
				Eastings	Northings	Min (mg/m3)/ (µg/m³)	Max (mg/m3)/ (µg/m³)	Ave (mg/m3)/ (µg/m³)
<b>Section 1(Kigoma Rural, Kigoma Urban and Uvinza); Type of equipment and methodology (Series 500 Portable Air Quality Monitor, Light scattering). Units in (mg/m3)</b>								
Rcpt-1	Kigoma station	Katosho Residential Area	Residential	793949	9462920	0.01	2.098	0.182
Rcpt-2	Nguruka station	Lugongoni primary school	Institution	284630	9433458	0.009	0.286	0.0268
Rcpt-3	Malagarasi station	Milya bibi	Residential	270932	9433757	0.016	0.177	0.037
Rcpt-4	Uvinza station	Chakulu	Residential	215686	9442305	0.013	2.171	0.850
Rcpt-5	Katosho station	Alpha adventist primary school and bright star primary school	Institution	797677	9462133	0.011	0.673	0.049
<b>Tanzania standard TZS 845: 2019</b>								<b>50</b>
<b>WHO Ambient Air Guidelines 2021</b>								<b>45</b>
<b>Section 2(Kaliua and Uvinza); Type of equipment and methodology (M 2000C, Gravimetric). Units in (µg/m3 )</b>								
Rcpt-1	Kaliua SGR station	Kaliua	Residential	371645.6	9336659.6	34	50	41.5
Rcpt-2	Kaliua Market	Kaliua Magharibi	Residential	366176.8	9440486.9	25	417	113.2
Rcpt-3	Usinge	Usinge	Residential	316376.1	9439486.3	18	239	49.5
Rcpt-4	Rugufu	Catholic Church	Institution	314650	9439911.9	28	248	88
Rcpt-5	Kazuramimba	Tambukareli	Residential	170067.5	9447526.4	38	770	69.8

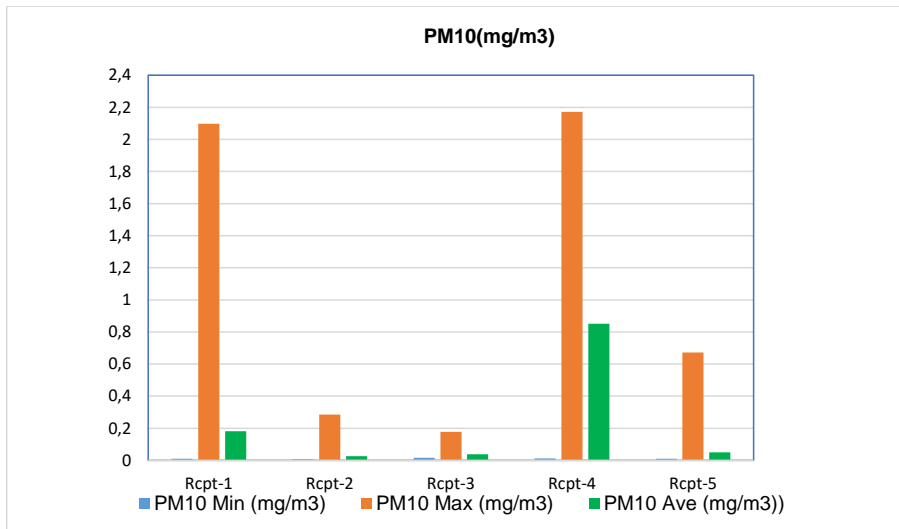


Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		PM10		
				Eastings	Northings	Min (mg/m3)/ (µg/m³)	Max (mg/m3)/ (µg/m³)	Ave (mg/m3)/ (µg/m³)
<b>Tanzania standard TZS 845: 2019</b>								<b>50</b>
<b>WHO Ambient Air Guidelines 2021</b>								<b>45</b>
<b>Section 3(Tabora urban- and Urambo); Type of equipment and methodology (Temtop PMD351 Portable Cleanroom Particle Counters) Units in (µg/m3 )</b>								
Rcpt-1	Tabora Urban	Unyanyembe TPDF School, Moravian Church	Institution	481115.1	94455923.9	51	1487.1	261.2
Rcpt-2	Ilolanguru	Tumbi Agricultural institute		465700.2	9446142.4	21	2287.1	102.6
Rcpt-3	Mabama	Village		444139.8	9444830.2	15.6	7740.1	194.2
Rcpt-4	Usoke	Usoke		423675.1	9438430.5	22.8	1001.2	92.9
Rcpt-5	Urassa	Primary school		403022.5	9441012.7	20.8	999.1	243.4
Rcpt-6	Mpigwa (Borrow Pit)	Industry		409232.6	9439298.1	22.4	1017.2	101.7
<b>Tanzania standard TZS 845: 2019</b>								<b>50</b>
<b>WHO Ambient Air Guidelines 2021</b>								<b>45</b>

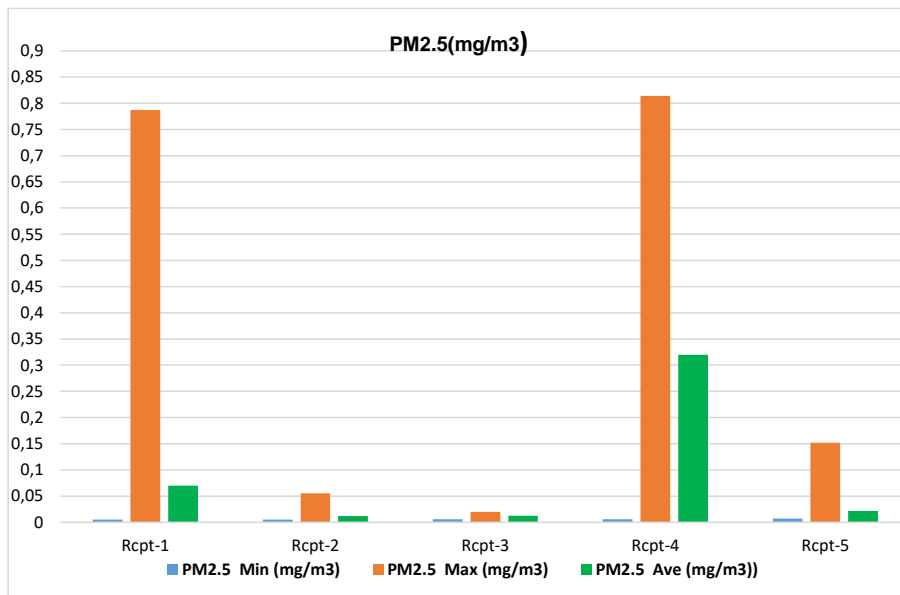
**Table 4-5: The data for Dust measured using PM 2.5 at the project site and the recommended WHO and TBS standards (mg/m3)**

Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		PM2.5		
				Eastings	Northings	Min (mg/m3)/ (µg/m <sup>3</sup> )	Max (mg/m3)/ (µg/m <sup>3</sup> )	Ave (mg/m3)
<b>Section 1(Kigoma Rural, Kigoma Urban and Uvinza); Type of equipment and methodology (Series 500 Portable Air Quality Monitor, Light scattering). Units in (mg/m3)</b>								
Rcpt-1	Kigoma station	Katosho Residential Area	Residential	793949	9462920	0.005	0.787	0.069
Rcpt-2	Nguruka station	Lugongoni primary school	Institution	284630	9433458	0.005	0.055	0.012
Rcpt-3	Malagarasi station	Milya bibi	Residential	270932	9433757	0.006	0.02	0.012
Rcpt-4	Uvinza station	Chakulu	Residential	215686	9442305	0.006	0.814	0.319
Rcpt-5	Katosho station	Alpha adventist primary school and bright star primary school	Institution	797677	9462133	0.007	0.152	0.021
<b>Tanzania standard TZS 845: 2019</b>								<b>50</b>
<b>WHO Ambient Air Guidelines 2021</b>								<b>45</b>
<b>Section 2(Kaliua and Uvinza); Type of equipment and methodology (M 2000C, Gravimetric). Units in (µg/m<sup>3</sup>)</b>								
Rcpt-1	Kaliua SGR station	Kaliua	Residential	371645.6	9336659.6	24	33	28.2
Rcpt-2	Kaliua Market	Kaliua Magharibi	Residential	366176.8	9440486.9	18	257	71.3

Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		PM2.5		
				Eastings	Northings	Min (mg/m3)/ (µg/m <sup>3</sup> )	Max (mg/m3)/ (µg/m <sup>3</sup> )	Ave (mg/m3)
Rcpt-3	Usinge	Usinge	Residential	316376.1	9439486.3	13	138	33.2
Rcpt-4	Rugufu	Catholic Church	Institution	314650	9439911.9	20	155	58.2
Rcpt-5	Kazuramimba	Tambukareli	Residential	170067.5	9447526.4	26	470	46.4
<b>Tanzania standard TZS 845: 2019</b>								<b>50</b>
<b>WHO Ambient Air Guidelines 2021</b>								<b>45</b>
<b>Section 3(Tabora urban- and Urambo); Type of equipment and methodology (Temtop PMD351 Portable Cleanroom Particle Counters) Units in (µg/m<sup>3</sup>)</b>								
Rcpt-1	Tabora Urban	Unyanyembe TPDF School, Moravian Church	Institution	481115.1	94455923.9	16.6	657.5	64.8
Rcpt-2	Ilolanguru	Tumbi Agricultural institute	Institution	465700.2	9446142.4	8.5	657.5	38.5
Rcpt-3	Mabama	Village	Residential	444139.8	9444830.2	8.1	829.8	52.9
Rcpt-4	Usoke	Usoke	Residential	423675.1	9438430.5	7.7	158.5	33.7
Rcpt-5	Urassa	Primary school	Institution	403022.5	9441012.7	6.5	819.5	43.1
Rcpt-6	Mpigwa (Borrow Pit)	Industry	Residential	409232.6	9439298.1	6.3	192.3	30.8
<b>Tanzania standard TZS 845: 2019</b>								<b>50</b>
<b>WHO Ambient Air Guidelines 2021</b>								<b>45</b>



**Figure 4-2: The concentrations of pollutants at Receptors in the project area**



**Figure 4-3: The concentration measurement for the PM 2.5**

**b) Ambient gaseous concentrations**

Table 4-6 summarizes ambient gaseous concentrations pollutants at various sampling points along SGR Tabora - Kigoma alignment. All sampling points recorded for oxygen were found with enough oxygen (O<sub>2</sub>) level ranging from 20.8 % to 21%. This range value is normal and naturally present in air environment. The baseline concentrations follow both Tanzania standard TZS 845: 2019 thresholds of 120 µg/m<sup>3</sup> and WHO ambient air quality guideline 2021 threshold of 100 µg/m<sup>3</sup>. Similarly, NO<sub>2</sub> ambient concentrations ranged from 5 µg/m<sup>3</sup> Rugufu-catholic church to 10 µg/m<sup>3</sup> at Kaliua market. The values are compliance with both Tanzania standard TZS 845: 2019 and WHO ambient air quality guideline 2021 thresholds of 80 µg/m<sup>3</sup>. The volatile organic compound concentrations ranged between 0 and 46 µg/m<sup>3</sup>. Further, all monitoring points were detected with 0.00 ppm of carbon monoxide or was below the detection limit of the Aeroqual S500 sensor.

**Table 4-6: The ambient gas concentration**

Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		Ambient gases (mg/m <sup>3</sup> )/ (µg/m <sup>3</sup> )						
				Eastings	Northings	SO <sub>2</sub>	NO <sub>2</sub>	CO <sub>2</sub>	CO	VOC	O <sub>2</sub>	HCHO
<b>Section 1(Kigoma Rural, Kigoma Urban and Uvinza); Type of equipment and methodology (Series 500 Portable Air Quality Monitor, Electrochemical Sensor). Units in (mg/m<sup>3</sup>)</b>												
Rcpt-1	Kigoma station	Katosho Residential Area	Residential	793949	9462920	0.038	0.038	0.0		0.016	-	-
Rcpt-4	Uvinza station	Chakulu	Residential	215686	9442305	0.090	0.030	0.0		0.004	-	-
<b>Tanzania Standard TZS 845: 2019</b>						<b>80</b>	80	-	2000	-	120	
<b>WHO ambient air guideline 2021</b>						<b>40</b>	80	-	4000	-	100	
<b>Section 2(Kaliua and Uvinza); Type of equipment and methodology (The 3M™ EVM 7 Environmental Monitor Kit, EPA modified West &amp; Gaeke/ Arsenite modified Jacobs &amp; Hochheiser/ NDIR). Units in (µg/m<sup>3</sup>)</b>												
Rcpt-1	Kaliua SGR station		Residential	371645.6	9336659.6	0.0	0.0	448.1	-	-	-	
Rcpt-2	Kaliua Market	Kaliua Magharibi	Residential	366176.8	9440486.9	0	0.1	460.6	-	-	-	0
Rcpt-3	Usinge	Usinge	Residential	316376.1	9439486.3	0	0	457.6	-	-	-	0
Rcpt-4	Rugufu	Catholic Church	Institution	314650	9439911.9	0	0.05	465.7	-	-	-	0
Rcpt-5	Kazuramimba		Residential	170067.5	9447526.4	0	0	483.9	-	-	-	0
Rcpt-6	Katosho station	Alpha school and bright star primary school	Institution	797677	9462133	0	0	426.77	-	-	-	-

Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		Ambient gases (mg/m <sup>3</sup> )/ (µg/m <sup>3</sup> )						
				Eastings	Northings	SO <sub>2</sub>	NO <sub>2</sub>	CO <sub>2</sub>	CO	VOC	O <sub>2</sub>	HCHO
<b>Tanzania Standard TZS 845: 2019</b>						<b>80</b>	80		2000		120	
<b>WHO ambient air guideline 2021</b>						<b>40</b>	80		4000		100	
<b>Section 3(Tabora urban- and Urambo); Type of equipment and methodology (Gas Analyzer E Instrument) Units in (mg/m<sup>3</sup>)</b>												
Rcpt-1	Tabora Urban	Unyanyembe TPDF School, Moravian Church	Institution	481115.1	94455923.9	0	0.03	0.06	0.52	-	20.87	-
Rcpt-2	Ilonguru	Tumbi Agricultural institute	Institution	465700.2	9446142.4	0	0.02	0.03	0	-	20.9	-
Rcpt-3	Mabama	Village	Residential	444139.8	9444830.2	0	0.02	0.03	0.07	-	20.91	-
Rcpt-4	Usoke	Usoke	Residential	423675.1	9438430.5	0	0.03	0.04	0.42	-	20.94	-
Rcpt-5	Urassa	Primary school	Institution	403022.5	9441012.7	0	0	0.03	0.06	-	20.89	-
Rcpt-6	Mpigwa (Borrow Pit)			409232.6	9439298.1	0	0	0.03	0	-	21	-
<b>Tanzania Standard TZS 845: 2019</b>						<b>80</b>	80	-	2000	-	120	-
<b>WHO ambient air guideline 2021</b>						<b>40</b>	80	-	4000	-	100	-

## 4.6 NOISE AND VIBRATION ANALYSIS

### 4.6.1 Noise monitoring

The fundamental goals of noise management are to develop criteria for deriving safe noise exposure levels and to promote noise assessment and control as part of environmental health programmes. These basic goals guide both international and national policies for noise management.

Below are the international policies (IFC/WHO) and National Environmental Management (Noise and Vibration) Regulations, (2007) for noise management.

**Table 4-7: IFC/WHO Noise Standards**

Receptor	L <sub>Aeq</sub> (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

**Table 4-8: The National Environmental Management (Noise and Vibration) Regulations, (2007)**

FACILITY		NOISE LIMITS dBA (Leq)	
		Day	Night
A.	Any building used as hospital, convalescence home, home for the aged, sanatorium and institutes of higher learning, conference rooms, public library, environmental or recreational sites.	45	35
B.	Residential building	50	35
C.	Mixed residential (with some commercial and entertainment)	55	45
D.	Residential and industry small-scale production and commerce	60	50
E.	Industrial area	70	60

Noise monitoring was carried out for the purposes of establishing the existing ambient noise levels in the area of the proposed project to comply with international and national policies for noise management. In general, the noise level limit is represented by the background or ambient noise levels that present in the absence of the project activity or noise source(s) under investigation.



Environmental noises were measured by consider the frequency content of the sounds, the overall sound pressure levels and the variation of these levels with time. Sound pressure is a basic measure of the vibrations of air that make up sound. Because the range of sound pressures that human listeners can detect is very wide, these levels are measured on a **logarithmic scale with units of decibels**.

Because sound pressure levels are measured on a logarithmic scale they cannot be added or averaged arithmetically instead was calculated by using the formula below.

$$LA_{eq}=10*\log_{10}(10^L/10)$$

**L10:** L10, the level exceeded for 10% of the recording time. For 10% of the recording time, the sound or noise has a sound pressure level above L10. For the rest of the time, the sound or noise has a sound pressure level at or below L10. L10 is commonly used to assess intermittent or peak noise events that may be disruptive or annoying.

**L90:** L90 represents the sound level which was exceeded for 90% of the time. That is, for 90% of the time for the period measured, the noise level was at least above the L90 level. The L90 level is often used as an approximation of the background noise level.

**Lmax:** Lmax represents the maximum sound level recorded during a given period. It indicates the highest level of sound that was measured during that period. Lmax is useful for identifying peak noise events or determining the maximum sound pressure level reached.



**LAeq** stands for Equivalent Continuous Sound Level. It is a commonly used metric in sound measurement and analysis to represent the average sound level over a specific time period.

The **LAeq** considers the sound levels measured at different time intervals and provides a single value that represents the overall average sound level. It is calculated by taking the logarithmic average of the sound pressure levels measured over the specified time period and then converting it into a decibel scale.

The LAeq metric is useful for assessing and comparing different sound environments or noise exposures. It provides a standardized way to quantify the overall sound level, considering both the intensity and duration of sound.

The **LAeq** is valuable for understanding the long-term exposure to sound and its potential effects on human health and well-being. It helps in determining the average noise levels experienced by individuals over a specific time frame, allowing for better analysis, comparison, and decision-making regarding noise control and mitigation measures.

**Table 4-9: Tools used for Noise measurements**

S/N	Tool photos	Tool name
1		SLM-25 noise meter
2		Hand GPS

**4.6.1.1 Day- time and night – time baseline noise conditions**

Table 4-10 and Table 10-11 present a summary of day-time noise levels at various receptors along SGR Tabora - Kigoma alignment. The day-time A-weighted equivalent continuous sound energy level (LAeq(10h)) results ranged from 49.6 dB(A) (Alpha and Bright star primary school at Katosho station) to 69.3dBA (Kigoma station: Katosho residential area). Approximately 50% of the record during day time in table 4.10 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 is represented in table 4.11 which ranged from 42 to 65.7 and for the night time the ranges from 55.6 dB(A) Kaliua to 41.6 Ilolanguru; The high value of the noise depended on the location, the night time was affected much the noises from birds and insects.

**Table 4-10: The Data measured for Noise Level at the project site taken for 10hours and 8hours**

STATION	Receptor Name	Receptor Type	Receptor code	Coordinates		Day-time (10 h)							Night-time (8 h)						
						Energetic average of measured noise levels: dB(A)					TZS 932: 2017	IFC General EHS Guidelines (1.7)	Energetic average of measured noise levels: dB(A)					TZS 932: 2017	IFC General EHS Guidelines (1.7)
						Easting	Northings	LAeq (10h)	L10	L90	LA Min	LAMax	dB(A)	dB(A)	LAeq (8h)	L10	L90	LA Min	LAMax
Kigoma station	Katosho Residential Area	Residential	Rcpt-1	793949	9462920	69.3	56.8	41.3	37.1	83.0	55	55	63.1	54.2	38.0	35.9	92.1	45	45
Nguruka station	Lugongoni primary school	Institution	Rcpt-2	284630	9433458	50.9	50.9	35.1	33.1	77.0	45	55	50.5	49.4	36.2	34.9	74.9	35	45
Malagarsi station	Milya bibi	Residential	Rcpt-3	270932	9433757	58.3	53.8	38.4	32	87.4	55	55	52.1	53.9	46.7	42.5	69.1	35	45
Uvinza station	Chakulu	Residential	Rcpt-4	215686	9442305	58.5	52.2	37.2	30.5	78.7	50	55	51.5	54.7	37.2	34.6	62.7	35	45
Katosho station	Alpha and Bright star primary school	Institution	Rcpt-5	797677	9462133	49.6	48.7	38.3	34.4	72.5	45	55	47.9	53.6	36.8	35.3	70.0	35	45

(Source: PaulSam Geo-Engineering Site Visit, 2023)

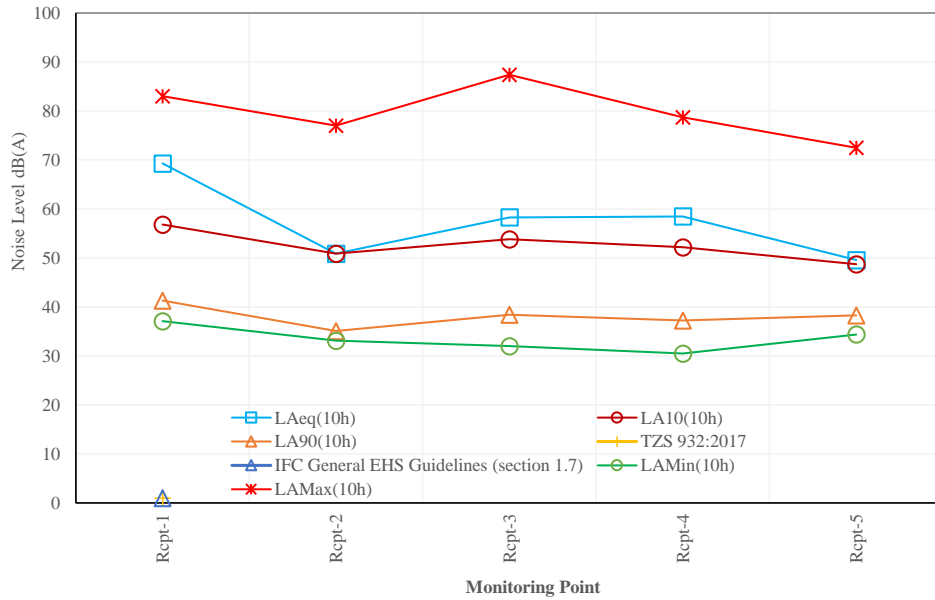


Figure 4-4: Noise levels against monitoring points for the duration of 10 hours

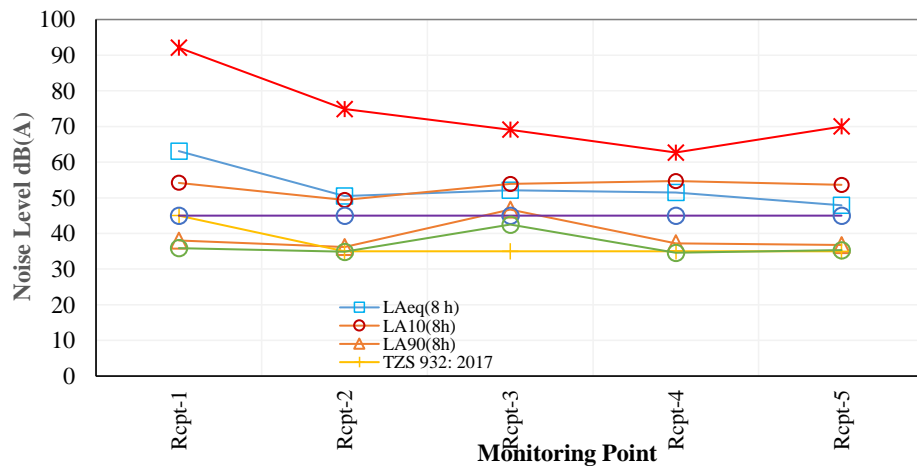
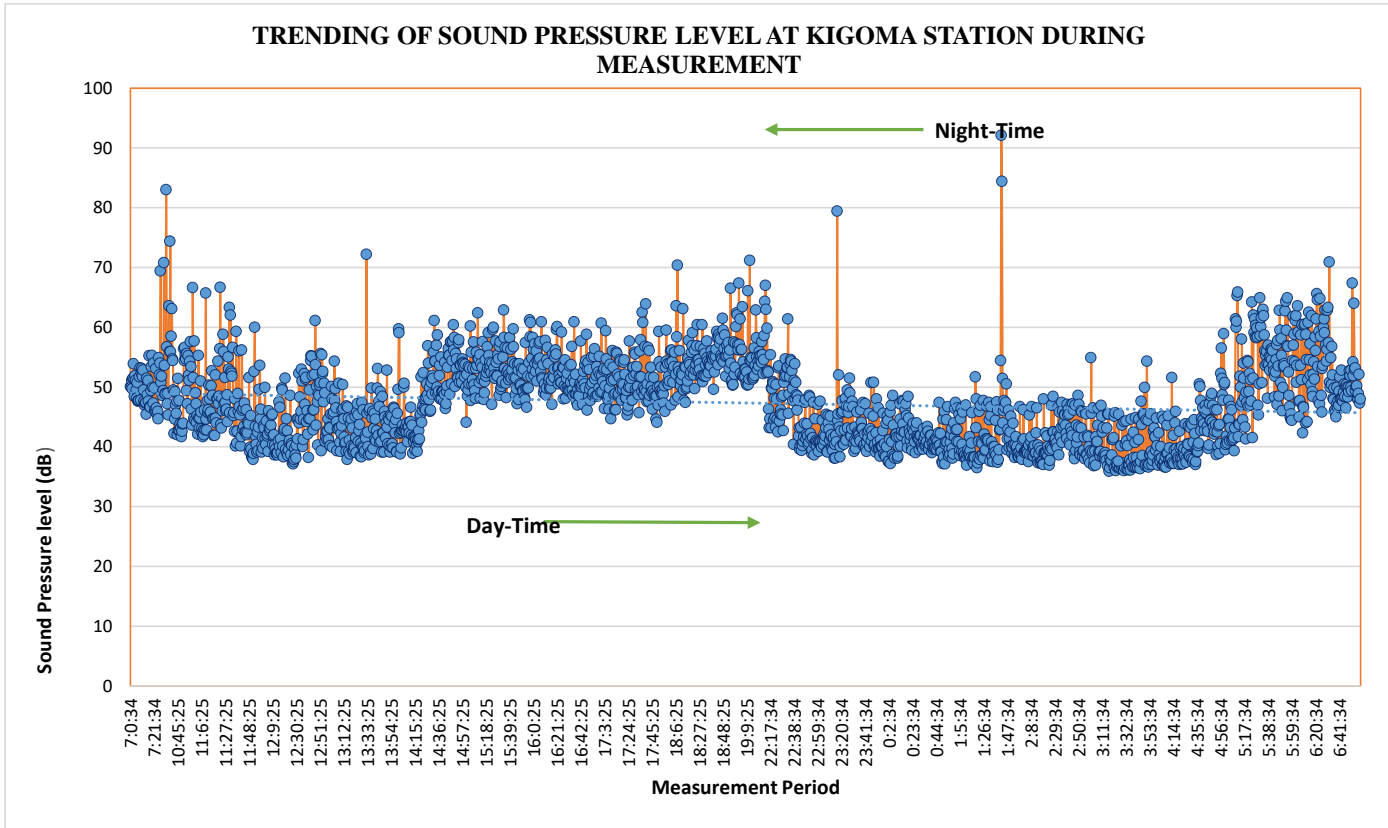
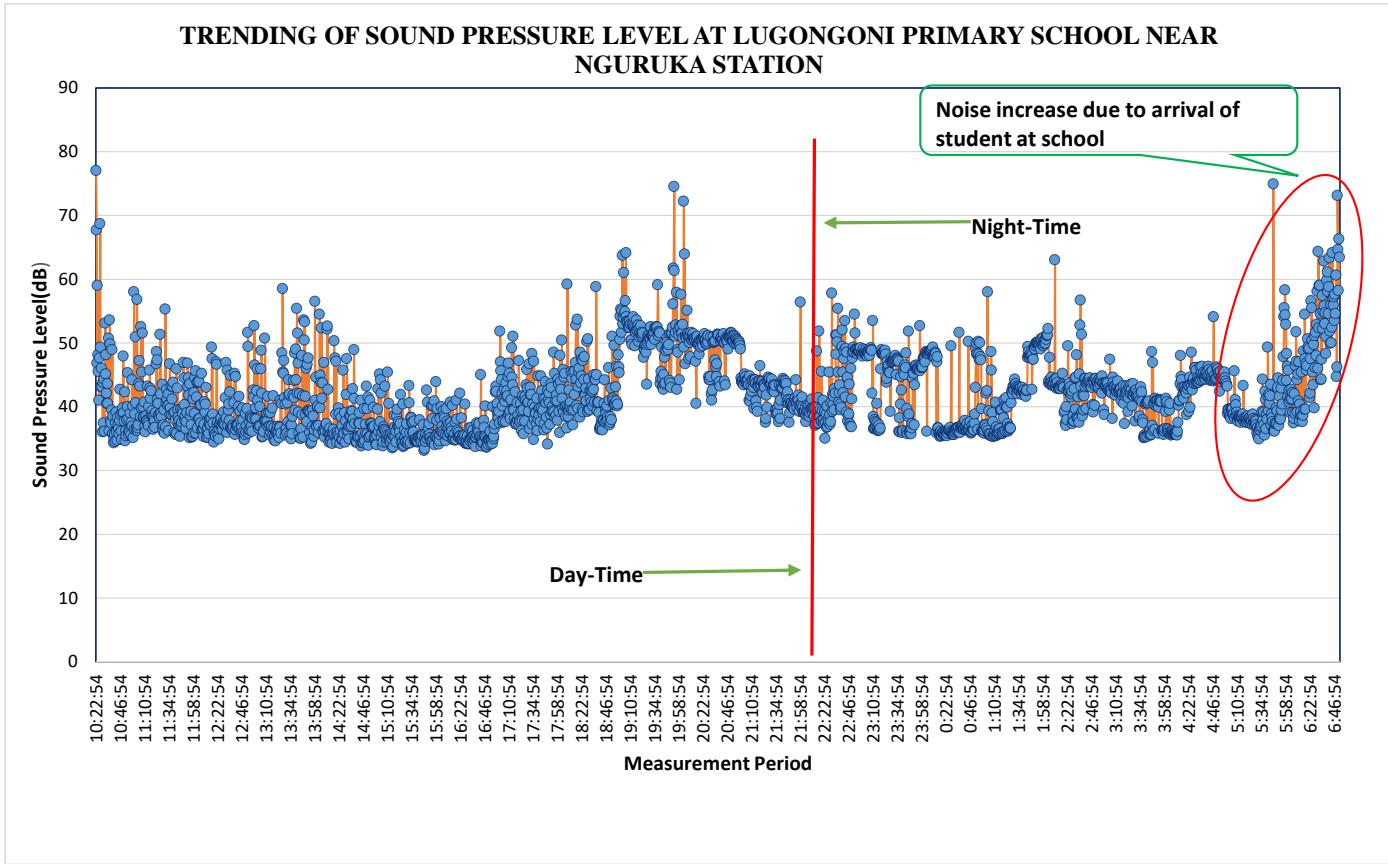


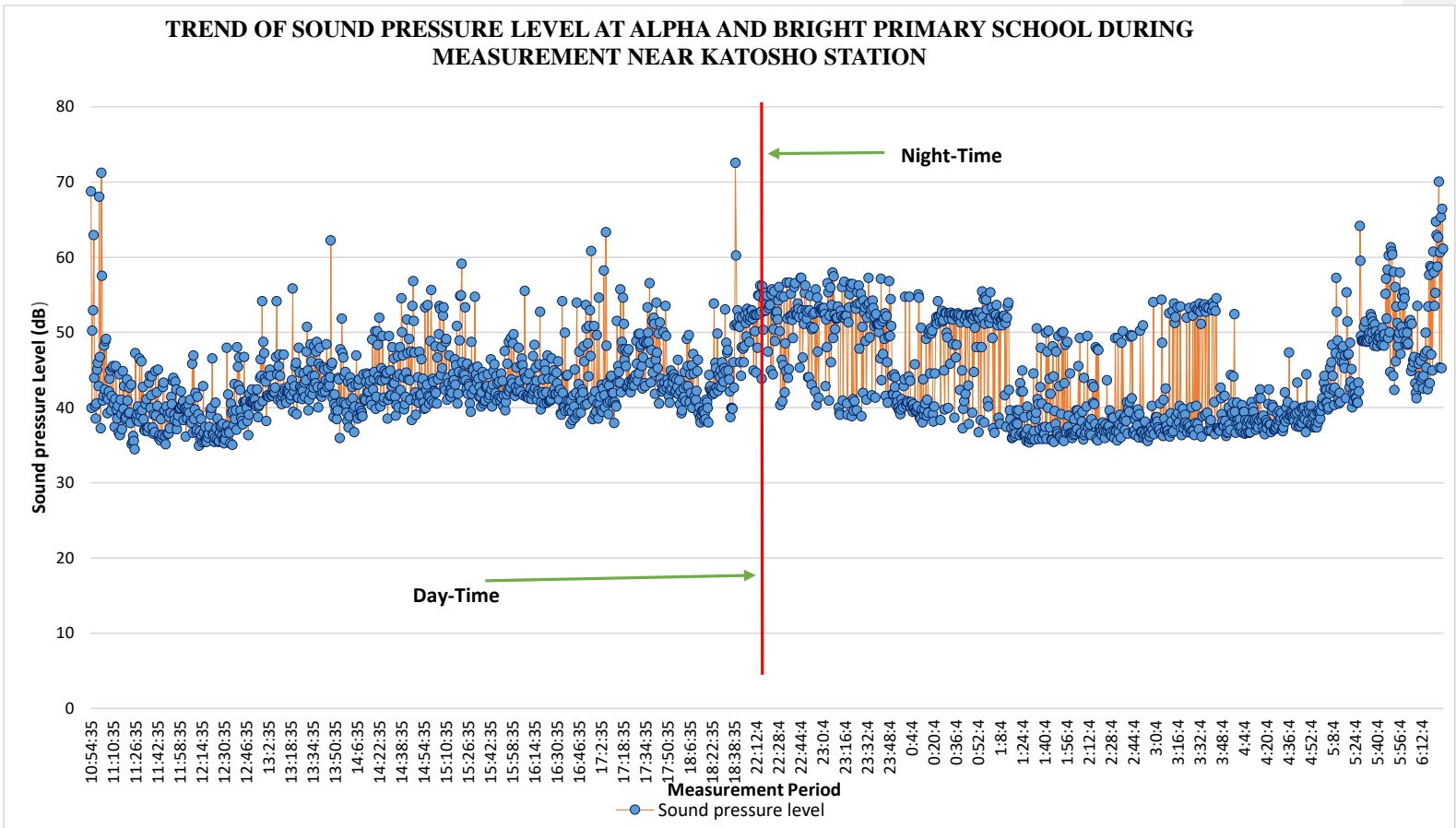
Figure 4-5: The noise levels against monitoring points for the time duration of 8 hours



**Figure 4-6: Trending of sound pressure level at Kigoma station**



**Figure 4-7: Trending of sound pressure level at Lugongoni Primary school**



**Figure 4-8: Trend of sound pressure level at Alpha and Bright Primary school**

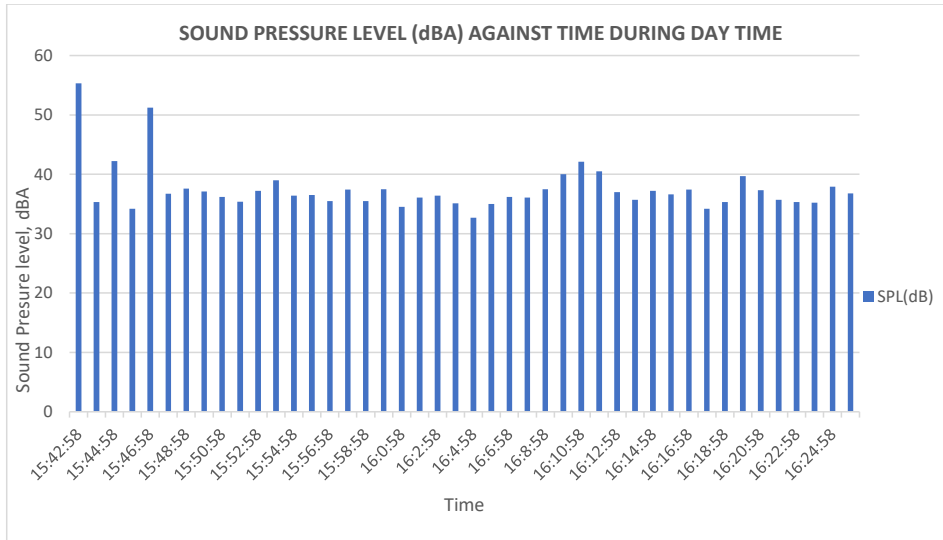
*(Source: PaulSam Geo-Engineering Site Visit, 2023)*

**Table 4-11: The Data measured for Noise Level at the project site taken for 1 to 2hrs during the day and night time**

STATION	Category of receiver	Period	Acceptable Rating Level dBA	LAeq.T dBA (Field Measurement)	Maximum dBA	Minimum dBA	L <sub>10</sub>	L <sub>90</sub>	Date
Tabora Urban		Daytime		51.6	67.5	38.4	51.2	51.9	16-17/07/2023
		Night-time		48.0	63.4	36.6	47.6	48.4	
Ilolanguru		Daytime		44.4	61.1	37.1	47.1	44.7	17-18/07/2023
		Night-time		41.6	60.8	35.7	39.9	40.8	
Mabama		Daytime		47.2	74.1	34.9	47.1	47.2	18-19/07/2023
		Night-time		41.9	69.6	34.5	44.4	40.6	
Usoke		Daytime		44.1	68.2	35.3	40.7	44.2	19-20/07/2023
		Night-time		44.1	68.2	35.3	40.7	44.2	
Urassa		Daytime		55.2	86.9	35.7	42.7	55.1	20-21/07/2023
		Night-time		50.9	77	35.8	47.3	48.8	
Mpigwa Borrow Pit		Daytime		50.2	73.3	37.1	47.2	50.4	21-22/07/2023
		Night-time		50.6	77.6	37.2	54.2	50.7	
Kaliua SGR station		Daytime		65.7	79.8	34	64.6	66	16-17/07/2023
		Night-time		55.6	43.4	66.5	45.9	55.8	16-17/07/2023
Usinge		Daytime		51.8	55.3	45.1	51.9	52.1	17-18/07/2023
		Night-time		42.6	49.1	36.8	45.7	42.6	17-18/07/2023
Rugufu		Daytime		47.20	53.60	40.60	44.30	42.30	18-19/07/2023
		Night-time		44.70	52.40	37.40	47.10	44.90	18-19/07/2023
Kazuramimba		Daytime		42	<b>55.30</b>	<b>32.70</b>	<b>49.90</b>	<b>42.30</b>	19 -20-/07/2023
		Night-time		52.80	57.90	47.50	51.30	53.00	19 -20-/07/2023

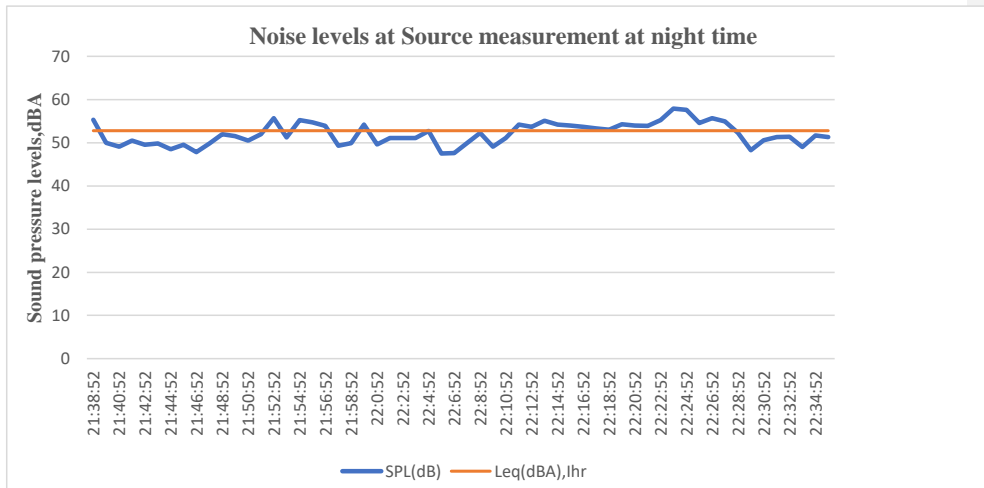
(Source: PaulSam Geo-Engineering Site Visit, 2023)





**Figure 4-9: Sound pressure level measured at Kazuramimba station during day time**

(Source: PaulSam Geo-Engineering Site Visit, 2023)



**Figure 4-10: Sound pressure level measured at Kazuramimba station during night time**

(Source: PaulSam Geo-Engineering Site Visit, 2023)

#### 4.6.2 Ground vibration monitoring

Is the level of vibration (peak particle velocity) measured in mm/s in the ground anywhere on the sensitive site. The ground vibration was undertaken at selected stations/points in the entire stretch of the SGR Line with respect to the sensitivity of the areas.

##### Peak Particle Velocity (V)

The maximum instantaneous sum of the velocity vectors of the ground movement measured in three orthogonal directions (expressed in millimeters per second).

##### Methodology

The measurements of vibrations were conducted using unattended environmental vibration logging equipment. The determination of vibration levels was performed using the standard method, employing the BVB-8206SD Vibration Meter data logger. This vibration meter had a measurement range of 0.1 to 199.9mm/s (0.02 to 7.87inch/s) and a frequency range of 10Hz to 1 kHz.

The accuracy of the vibration meter was specified as (5%rdg ± 2d) at 80 and 160Hz. To ensure accurate readings, the meter underwent calibration using electrical calibration techniques, with a calibration point of 50mm/s (160Hz). During the measurements, the vibration meter was set to the millimeter per second (VEL mm/s) scale, Vibration meters, are capable of measuring vibrations in multiple scales, including velocity. The millimeter per second (VEL mm/s) scale is commonly used for assessing the impact of vibrations on structures and human perception.

Data collection within the project area involves strategically placing vibration sensors at various points to capture ambient vibration within the project area. The sensor was placed on or in the ground on the side of the structure towards the (Source of Vibration) A structure that was considered during vibration monitoring was a house, pipeline, telephone pole, etc. Location for monitoring was relative to the structure whereby Sensor was placed to ensure that the data obtained adequately represents the ground-borne vibration levels received at the structure.

Where access to a structure and/or property is not available, the sensor should be placed closer to the vibration source) in undisturbed soil. Measurements on driveways, walkways, slabs, disturbed soil, Loose fill material, unconsolidated soils, flower-bed mulch or other unusual mediums were avoided because it has an adverse influence on the recording accuracy.

##### TOLERANCE LIMIT FOR GROUND VIBRATION AT SENSITIVE AS PER NATIONAL ENVIRONMENTAL MANAGEMENT (NOISE AND VIBRATION) REGULATIONS, (2007)

Limit on ground vibration	Description
5 mm/s PPV at all times	Not be exceeded more than that

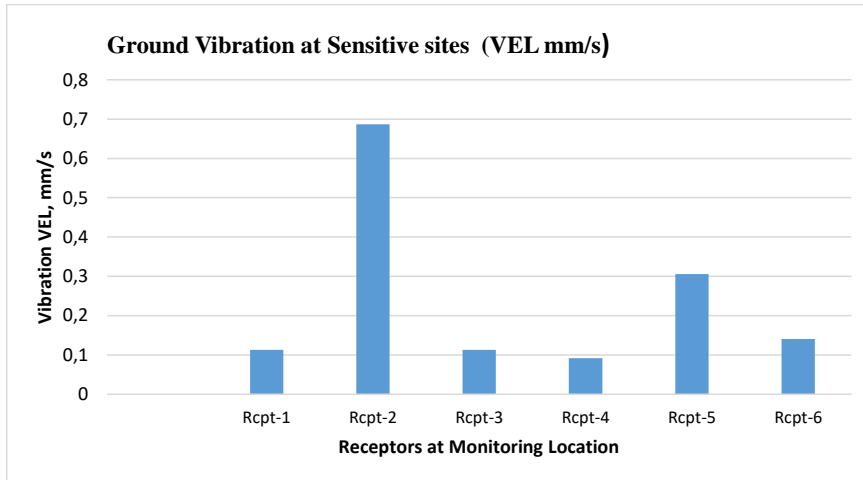
#### 4.6.2.1 Summary of Vibration

Table 4.12 provides a summary of baseline vibration (**VEL mm/s**) -velocity measured at various sensitive receptors along SGR Tabora - Kigoma alignment. The measured vibrations are compared to 5mm/s PPV at all times. Results of vibration ranged from 0.11 mm/s (at Rcpt 1- Kigoma station) to 0.68 mm/s (at Rcpt 2 Neurula station). All monitoring points of the measured vibration was found to follow the Guidelines vibration.

**Table 4-12: The summary of the result of vibration monitoring at site.**

Receptor Code	STATION	Receptor Name	Receptor Type	Coordinates		Ground Vibration at Sensitive sites (VEL mm/s)	Limit on Ground Vibration
				Eastings	Northings		
Rcpt-1	Kigoma station	Katosho Residential Area	Residential	793949	9462920	0.112	5mm/s PPV at all times
Rcpt-2	Nguruka station	Lugongoni primary school	Institution	284630	9433458	0.686	
Rcpt-3	Malagarasi station	Milya bibi	Residential	270932	9433757	0.112	
Rcpt-4	Uvinza station	Chakulu	Residential	215686	9442305	0.091	
Rcpt-5	Katosho station	Alpha adventist primary school and bright star primary school	Institution	797677	9462133	0.305	
Rcpt-6	Kaliuwa-Market, MGR Station	Kaliuwa-Market, MGR Station	Mixed residential (with some commercial and entertainme nt)	366123	9440393	0.140	

(Source: PaulSam Geo-Engineering Site Visit, 2023)



**Figure 4-11: Ground vibration at sensitive sites (VEL mm/s)**

## 4.7 BIODIVERSITY ENVIRONMENT

### 4.7.1 Flora Characteristics

The survey has identified a total number of vascular plant species 257 from 57 families. Out of that five species needs conservation concern includes IUCN Red listed 2 tree species *Pseudospondia microcarpa* and *Monanthotaxis discolor* and two species falls in CITES, 111 timber tree species of *Pterocarpus angolensis* and *Pterocarpus tinctorius* while one tree species is purely endemic to floristic T4 *Acacia bullockii* respectively. The above species are all woody species of the tree life form.

Six families has the highest diversity of plant species includes *Gramineae/Poaceae* 34, *Caesalpinoideae* 20, *Euphorbiaceae* 19 *Mimosoideae* 16, *Papilionoideae* 15 and *Rubiaceae* 13. The rest of 51 families are represented with species ranging from 10-1 respectively.

The above results reveal that the entire corridor has the highest diversity of plant species with species of conservation concern. Therefore, it is highly proposed that during the implementation of the project activities, the proposed mitigation measures in the Flora report accompanied with this report should be highly complied.

In Kigoma region 52 useful plants species were identified and documented they include 42 medicinal, 5 timber and 5 wild foods. In Tabora region 23 useful plant species were identified and also documented, 15 medicinal 5 timber and 3 plants used as wild food. This reveals that the plant species occurring in the project area have a high diversity of uses ranging from medicinal, food, fuel building materials and animal food also.

### 4.7.2 Key plant species identified from the project site.

Key plant species are those plants which needs conservation concern globally and locally due to either habitat loss, restricted habitat, declining its number of individuals due to over exploitation as well as climate changes. Those key plant species are categorized in the following groups; IUCN Red listed of threatened species categories, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Endemic plant species.

Uvinza *Acacia bullockii*, a tree species that is solely unique to floristic region T7, has been found growing in the project area at Masanza Forest Reserve. The endangered tree species found in Kaliua's Drier Miombo Woodland, close to Contractors Base Camp, is growing there as shown in plate 7. As illustrated in plate 8, the other tree species, *Pseudospondia microcarpa*, which was shown to be growing in riverine vegetation, is threatened.



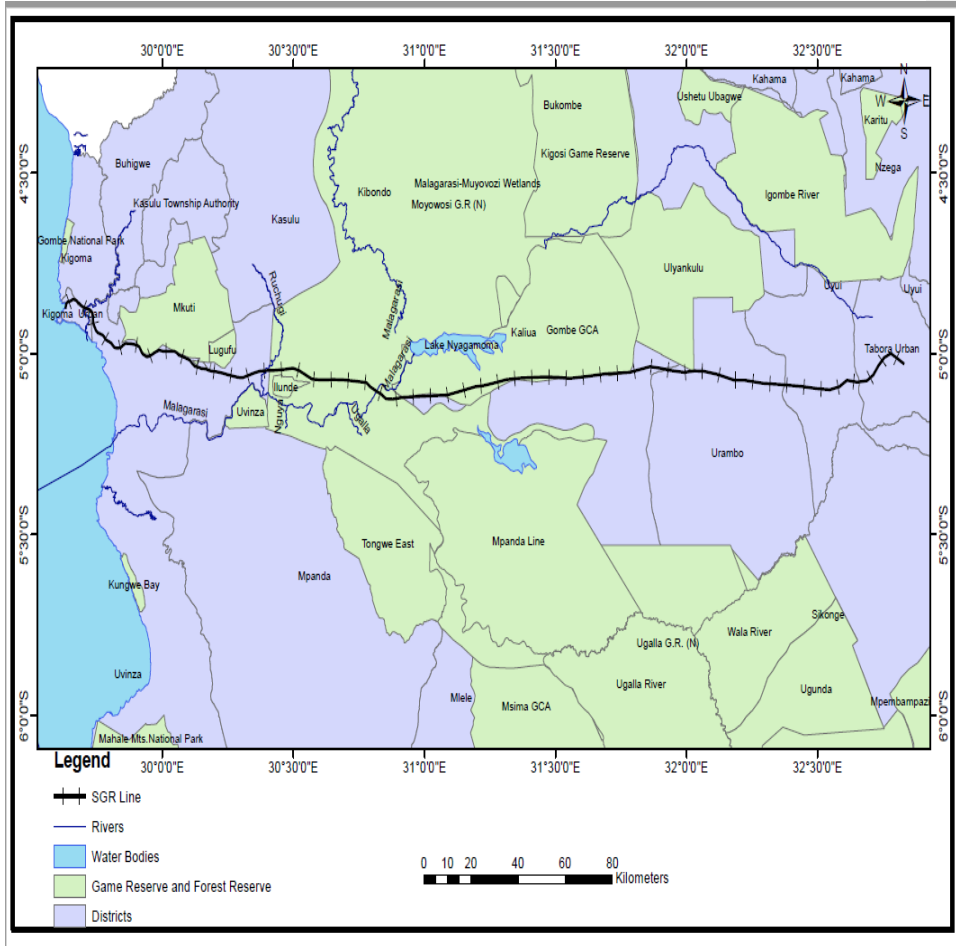
**Plate 4-3: UICN Endangered (EN) tree species *Monanthotaxis discolor* growing in drier miombo woodland at Kaliua district in Tabora region**



**Plate 4-4: IUCN threatened tree species *Pseudospondia microcarpa* (VU) growing in the riverine forest at Luiche river**

#### **4.7.3 Vegetation categories in the study area.**

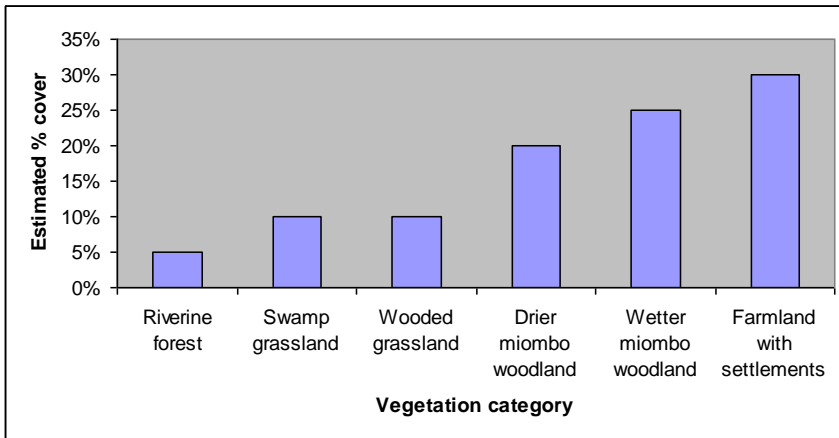
Vegetation is an integrator of environmental factors in that it reflects the climatic, physiographic, seraphic and biotic features pertaining to the land on which it grows. An understanding of the vegetation and plants of an area can therefore give good insights into the agricultural or biological potential of that area. Some land uses also depend directly on the vegetation resource and in this case an inventory of vegetation is obviously of great importance (Timberlake, Nobanda and Mapoure, 1993)



**Figure 4-12: Ecosystem close to the project area**

4.7.3.1 *The existing situation of the vegetation types;*

In the proposed SGR line corridor six vegetation types have been classified named Wetter Miombo woodland, Drier Miombo woodland, Swamp grassland, Wooded grassland, Riverine forest and Farmland with settlements as shown on figure 4.11.



**Figure 4-13: Vegetation categories classified from the project area with their estimated percentage cover.**



**Plate 4-5: Farmland with settlement vegetation type near Luiche railway station.**

(Above left) patch of cassava field (*Manihot esculenta*) and behind is a patch of palm oil plantation *Elaeis guineensis*





**Plate 4-6: Wetter miombo woodland patches at the forest reserves of Masanza (left) and Ilunde (right) in Uvinza district, Kigoma region.**



**Plate 4-7: Drier miombo woodland at Gombe forest reserve Kaliua Tabora.**

The dominant canopy tree species are *Brachystegia spiciformis* and *Pterocarpus angolensis* timber tree species



**Plate 4-8: A patch of disturbed wooded grassland vegetation found at Uvinza near Lugufu forest reserve. The dominant grass on the fore ground is *Loutedia simplex***



**Plate 4-9: Swamp grassland vegetation type as Malagalasi river. The tall tree behind (left) is a palm tree *Borrasmus aethiopum*. (Right) behind are cattle grassing on the grassland.**

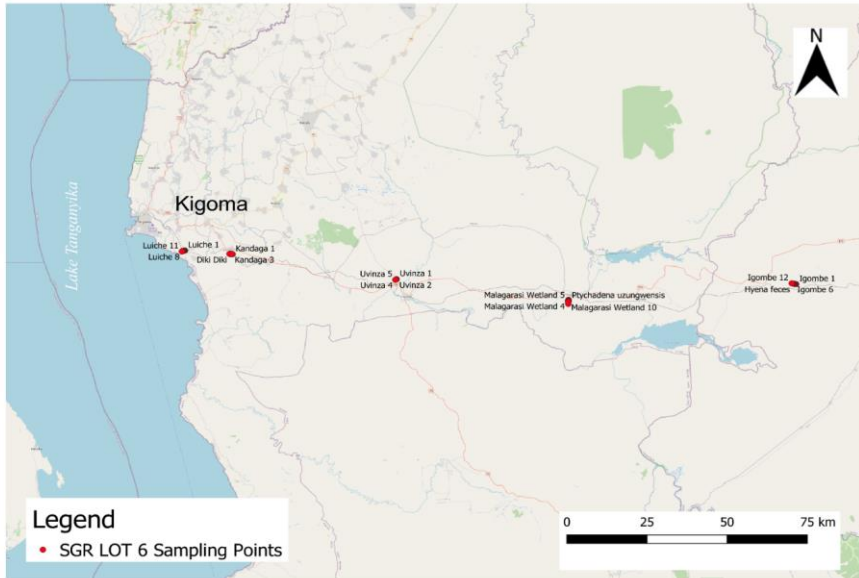


**Plate 4-10: Riverine forest vegetation type at Kasuramimba area dominated with tree species *Acacia polyacantha* and *Vitex doniana* along the river bank**

#### 4.7.4 Fauna Characteristics

##### 4.7.4.1 Fauna Habitats

The following key habitat types are represented by the flora habitats along the SGR alignment from Tabora to Kigoma: protected areas (game reserves, forest reserves, Ramsar sites), open space and designated wooded areas, wetlands/aquatic habitats, and agroecosystems. The subsections below address the significance of the important habitats in maintaining fauna species in the region. In particular, OS3-Biodiversity and Ecosystem Services, which are AfDB standards, were taken into account while identifying habitats. These environments are divided into two categories: "natural" habitats and "modified" habitats. This classification classifies all protected areas as natural habitats, while agro-pastoral land is categorized as a modified habitat.



**Figure 4-14: Sampling points for fauna study within the Lot 6 SGR line project**

#### 4.7.4.2 *Mammals*

Twenty-six mammal's species were identified and confirmed as occupants of the surveyed wildlife areas. Of the recorded large mammals, elephant (*Loxodonta Africana*) which is listed in the CITES as critically endangered was also reported to utilize the areas. Chimpanzee (*Pan troglodytes*), a charismatic species in the western Tanzania ecological zone is reported to be frequently cited within the Tongwe East, Ugalla River National Park into Uvinza-Ilundwe Fores Reserve Areas. The rest of the mammals' species included typical savannah with miombo open woodland and gallery forests species.



**Plate 4-11: Animal signs identified in the project area; a) pellets of African hare, b) Spoor of Lions, c) Squirrel pellets and d) Droppings of Porcupines**

#### 4.7.4.3 *Small mammals' species.*

During this, study three species of small mammals namely; *Mastomys natalensi*, *Rhabdomys* sp and *Lemiscomys* spp (Table 4.4; Plate 5).

**Table 4-13: Small mammals of the project area**

Location	Species	IUCN Category	Habitat	
Uvinza	<i>Mastomys natalensis</i>	LC	36 M 0206901	UTM 9441124
Uvinza	<i>Rhabdomys spp</i>	LC	36 M 0206805	UTM 9441080
Uvinza	<i>Lemiscomys spp.</i>	LC	36 M 0206629	UTM 9440975



**Plate 4-12: Small mammals of the project area**

(Source: PaulSam Geo-engineering Site Visit, 2023)

#### 4.7.4.4 *Birds*

A combination of field surveys and interviews with the local community resulted in two hundred and twenty five bird species that are known to occur in the project area. Of these, thirty-five (35) species were sighted during the field visits whereas the remaining one hundred and ninety two (192) were gathered from the interview with the local communities. According to IUCN Redlist, amongst them are one endangered (*Zoothera guttata*) and one vulnerable (*Bucorvus leadbeateri*) species. Overall, members of the two IUCN categories (endangered and vulnerable) only one, *Bucorvus leadbeateri*, occurred very frequently in most surveyed areas.

#### 4.7.4.5 *Reptiles and amphibians*

Three species of reptiles were spotted and identified during this study. Other 26 reptile species were compiled through the interview with Key Informants, therefore unverified. Of these, cobras were frequently cited to be common. On the other hand, insects in six Orders were found including a non-ground group, Order LEPIDOPTERA (butterflies and moths). The insects/invertebrates were found to be widely distributed in the study site. The specimens added up to 132 individuals



**Plate 4-13: A dead black mamba by the road at Kibaoni, Uvinza.**

The project area is within the ecological continuum and migratory ranges of animals utilizing Igombe Game Reserve, Msima Game Controlled Area, Rukwa Game Reserve, Lwafi Game Reserve, Inyonga Game Reserve, Ugalla Game Reserve, Ugalla River National Park, Masito Game Reserve, and Katavi National Park. The proximity of the project area to these higher conservation status areas acts as a source of animals. On top of the observed diversity, the presence of very shy and sensitive to environmental disturbances animals such Chimpanzee and Leopard, among others, amplifies the importance of areas within the project to the conservation of wildlife in the whole western ecological zone of Tanzania.

The juxtaposition of the areas to other protected areas in the zones suggests possible linkage and therefore like a corridor for many animals. The well-known Tongwe East and West protected areas which links with the Ugalla River National Park act as a sources and dispersal areas for animals moving northwards to Moyowosi Game Reserve through Igombe Game Reserve. Another corridor at Kazaroho-Kibaoni -Chakuru is also known for elephants moving from Mzito to Ilunde Forest. The animals include Lions, Leopards, Yellow Baboon, Hyena, Dikidiki, Kaka Kuona, Greater kudu, Bush baby, antelopes, Buffaloes, chimpanzee that are regularly spotted at villages of Ntakata of Mgambazi and other forests within Uvinza. This signifies that there several min-routes/corridors across the proposed railways line which must be taken into serious consideration.

In addition, the high number of birds species, comprising significant transcontinental migratory individuals strengthens the point that the forest reserves are not only locally important but also

of significant global values requiring proper protection. We associate such a level of richness to the occurrence of the area in the neighbourhood of the above protected areas as among the known 77 important bird areas (IBA) in Tanzania (Baker and Baker, 2002). An IBA is an area recognized as being a globally important habitat for the conservation of bird populations (Barnes, 1998). This means the proximity of the project area to these areas provides access for feeding and breeding thus movement and interchange of habitats depending on seasonality or food availability.

Several incidences of conflicts of human-wildlife as well as Government-Citizen have been reported within the study area. Human-Wildlife conflicts are frequent at Chakuru, Msebehi and Basanza where Hippo, Yellow Baboons, vervet monkey and crocodiles are the main culprits. Other areas of intense human-wildlife conflicts are Nguruka- Chagu, Ilalangulu, Mtego wa noti, Mwangaza and Malagarasi. Leopard and Lion are a problem at Luchugi and Uvinza. Law enforcement has been a centre of serious conflicts between Government and citizen, especially pastoralists.



**Plate 4-14: Intrusion of pastoralists into the conservation areas within the SGR LOT 6 project**

## **4.8 ARCHAEOLOGY AND CULTURAL HERITAGE**

### **4.8.1 Cultural heritage materials**

Within the proposed Project area, different cultural heritage materials/resources exist, including 4 potsherd artefact, 2 grave yard, 30 graves, and 1 slave route. The archaeological materials (potsherd) have low cultural heritage significance and belong to the local-district level while graves belong to the local level and slave route belong to National level status and

becoming critical site within the Proposed Project area. However, there is no non-replicable cultural heritage within the Project area.

#### 4.8.1.1 *The Potsherds*

These potsherds are linked with Bantu language speaker who lived to the Project area for centuries and scattered larger part of the of the Districts. Undecorated potsherd are more recent and less cultural values.



**Plate 4-15. An example of Potsherds documented within the Project area**

#### 4.8.1.2 *Graves*

The 30 graves and 2 grave yard recorded are probably less than 100 years ago. The Antiquities Act provides protection and guidance on how to conserve graves that are older than 100 years, as well as those which have cultural value. Graves recorded less than 100 years old are not classified to be part of cultural heritage.

In the African and Tanzanian context, graves and grave yard (Plate 4.2) have value regardless of age, as it is attached to the community around the area. In this regard, all graves recorded need to be protected regardless of their age. Appropriate mitigation measures need to be developed which comply with the Graves Removal Act (No. 9 of 1969).





**Plate 4-16: An example of grave recorded during survey**

#### 4.8.1.3 *Central Slave route and Ivory Route*

This is the main route that were documented in East Africa. Antiquities Division, under Ministry of Natural resources declared the Ujiji-Bagamoyo route as National Heritage and sent proposed to World Heritage Committee to be declared as World Heritage Site. Along the route has mangle tree used as a mark of the route (Plate 4.3).



**Plate 4-17: Mango tree along the Central Slave Route**

**Table 4-14: Lists of cultural heritages finds identified during field work**

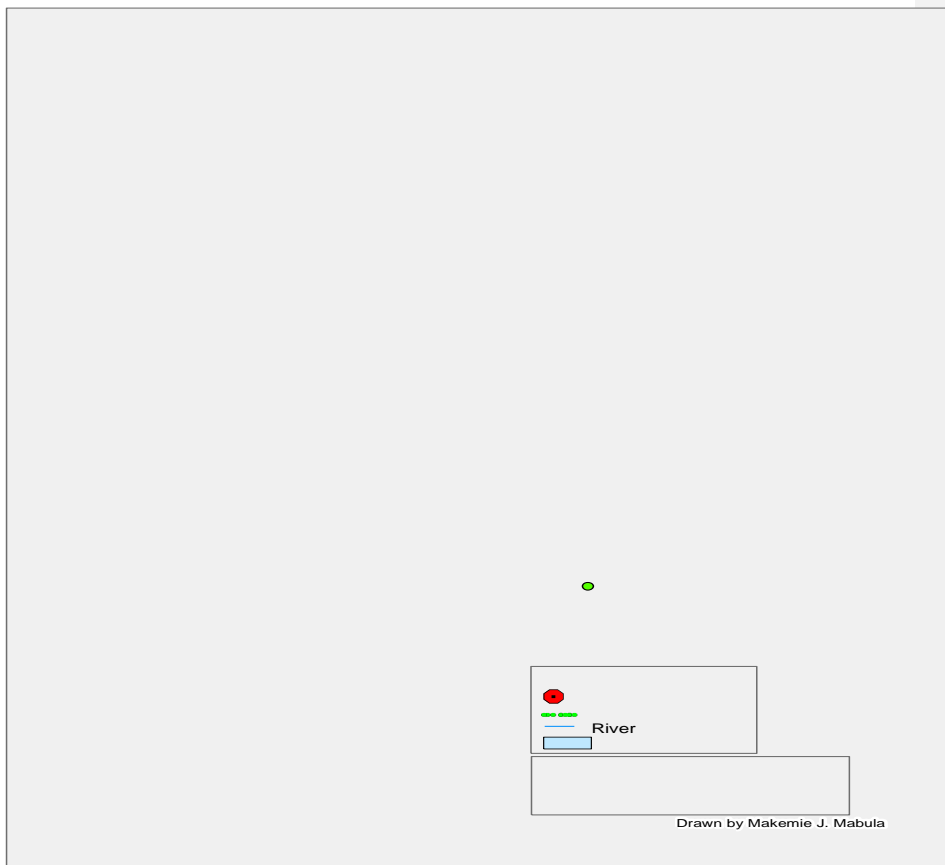
SN	Finds	GPS Coordinates	Village/ Street	Ward	District	Region
1	3- gravels	36M 0283638 UTM 9434251	NYAGABO	NGURUKA	UVINZA	KIGOMA
2	1-gravel	36M 0283522 UTM 9434273	NYAGABO	NGURUKA	UVINZA	KIGOMA
3	4 Potsherds	35M 0798672 UTM 9461200	KASAKA B (Kitongoji)	MUGONYA	KIGOMA RURAL	KIGOMA
4	Lines of mangoes indicating slave route	36M 0475012 UTM 9447139	USULE	MBUGANI	TABORA URBAN	TABORA
5	Gravel Yard for Muslim and Christians	36M 0480885, UTM 9444484	MALABI	MPELA	TABORA URBAN	TABORA
6	Gravel Yard	36M 0427924 UTM 9438164	USONGELANI	USSOKE	URAMBO	TABORA
7	6- gravels	36M 0407393 UTM 9440226	ITUNDU	ITUNDU	URAMBO	TABORA
8	3-gravels	36M 0407247 UTM 9440249	ITUNDU	ITUNDU	URAMBO	TABORA
9	6-gravels	36M 0407091 UTM 9440248	ITUNDU	ITUNDU	URAMBO	TABORA
10	1-gravel	36M 0407028 UTM 9440294	ITUNDU	ITUNDU	URAMBO	TABORA
11	1-gravel	36M 0405405 UTM 9440500	ITUNDU	ITUNDU	URAMBO	TABORA
12	3-gravels	36M 0405365 UTM 9440560	ITUNDU	ITUNDU	URAMBO	TABORA
13	1-gravel	36m 0405475 UTM 9440479	ITUNDU	ITUNDU	URAMBO	TABORA
14	1-gravel	36M 0405300 UTM 9440562	ITUNDU	ITUNDU	URAMBO	TABORA
15	1-gravel	36M 0405293 UTM 9440524	ITUNDU	ITUNDU	URAMBO	TABORA
16	1-gravel	36M 0405280 UTM 9440542	ITUNDU	ITUNDU	URAMBO	TABORA
17	1-gravel	36M 0390085 UTM 9441740	CHEKELENI	VUMILIA	URAMBO	TABORA
18	1-gravel	36M 0390040 UTM9441662	CHEKELENI	VUMILIA	URAMBO	TABORA

## 4.9 THE AQUATIC BIODIVERSITY

### 4.9.1 Aquatic characteristics

Aquatic ecosystems located within the electrified SGR line from Tabora to Kigoma (411 km Main Line and 95 km Siding/passing loops) on an alignment parallel to the existing Meter Gauge Railway line (MGR) include the Malagarasi Swamp Ramsar site, Luiche River and its flood plain wetland, other wetlands located within the SGR corridor. Suleke and Ruchugi Rivers which are tributaries of the Malagarasi River.

The study was done by sampling site of aquatic organisms as shown in the Figure 4-16



**Figure 4-15: Showing sampling sites of aquatic organisms along the Standard Gauge Railway line Lot-6, between Tabora and Kigoma in July 2023.(Source:**

The Malagarasi swamp and other wetland areas within the SGR corridor provide habitats for aquatic life including fishes, monitor lizards, crocodiles and hippos. Habitat connectivity is important for conserving biodiversity in these ecosystems. The Usinge swamp is connected to Lake Sagara and Malagarasi River during wet season. However, remains disconnected when it dries up during the dry season.

Among the wetland near the railway is Kibirizi Wetland. This is a freshwater marsh near Kigoma Railway Station. The area is an important spawning nursery, refuge and feeding habitat. This is an important wetland habitat which has a direct connection to Lake Tanganyika. The other essential habitats for aquatic life are Malagarasi – Muyowosi Ramsar site and the Usinge swamp; Luiche River, Ruchugi and Suleke Rivers, wetlands connected to Luiche in the Simbo area, and Katosho and Kibirizi Wetland which is connected to Lake Tanganyika



**Plate 4-18: Kibirizi Wetland located adjacent to Lake Tanganyika near Kigoma Railway station.**



**Plate 4-19: Katosho wetland located near the proposed Kigoma dry port area.**

Fish diversity in the rivers and wetlands was relatively high, with the highest diversity of fish species found in the Malagarasi-Muyowosi swamps and Ruchugi followed by Luiche River (Table 2) and plate 3. In total there were about 50 species identified. The dominant species being the Nile tilapia (*Oreochromis niloticus*) followed by *Tilapia rendalli* and *Oreochromis tanganycae*. The size of the collected fish ranged from juveniles 3.7 cm to 14 cm (for Tilapia), to 49.3 cm. Most fish species in the rivers and wetlands are assessed under the IUCN Red List Categories as Least Concern (LC). However, there were many species which have been assessed as Critically Endangered. The Malagarasi River has the most of the endemic species.



**Plate 4-20: The ecosystem services**

**Table 4-15: A list of fish species collected from the rivers and wetland sites between Tabora and Kigoma showing the sampling sites, and their conservation status.**

SITE	Species	Conservation Status
Katosho Pond	<i>Clarias gariepinus</i>	Least Concern
	<i>Oreochromis niloticus</i>	Least Concern
	<i>Protopterus aethiopicus</i>	Least Concern
	<i>Tilapia rendalli</i>	Least Concern
Kibirizi Wetland	<i>Ctenochromis horii</i>	Least Concern
	<i>Lethrinops macracanthus</i>	Data Deficient
	<i>Oreochromis leucostictus</i>	Least Concern
	<i>Oreochromis niloticus</i>	Least Concern
	<i>Oreochromis shiranus</i>	Least Concern
	<i>Oreochromis tanganyicae</i>	Least Concern
	<i>Protopterus aethiopicus</i>	Least Concern
	<i>Serranochromis robustus</i>	Critically Endangered
Luiche River (SGR Crossing)	<i>Bagrus docmak</i>	Least Concern
	<i>Barbus paludinosus</i>	Least Concern
	<i>Clarias gariepinus</i>	Least Concern
	<i>Gnathonemus longibarbis</i>	Least Concern
	<i>Hippopotamyrus discorhynchus</i>	Least Concern
	<i>Labeo worthingtoni</i>	Extinct
	<i>Raiamas moorei</i>	Least Concern
Luiche River (Upstream)	<i>Anguilla mossambica</i>	Near Threatened
	<i>Auchenoglanis occidentalis</i>	Least Concern
	<i>Brycinus imberi</i>	Least Concern
	<i>Chrysichthys platycephalus</i>	Least Concern
	<i>Hydrocynus vittatus</i>	Least Concern
	<i>Malapterurus electricus</i>	Least Concern
	<i>Mormyrops deliciosus</i>	Least Concern
	<i>Plectorhynchus playfairi</i>	Least Concern
	<i>Schilbe moebiusii</i>	Least Concern
Malagarasi-Muyowosi Swamp	<i>Bagrus docmak</i>	Least Concern
	<i>Barbus jacksonii</i>	Least Concern
	<i>Barbus paludinosus</i>	Least Concern
	<i>Brycinus imberi</i>	Least Concern
	<i>Clariallabes petricola</i>	Data Deficient
	<i>Clarias gariepinus</i>	Least Concern
	<i>Elops machnata</i>	Least Concern
	<i>Labeo mesops</i>	Critically Endangered
	<i>Megalops cyprinoides</i>	Data Deficient
	<i>Mormyrus kannume</i>	Least Concern
	<i>Oreochromis niloticus</i>	Least Concern
	<i>Oreochromis tanganyicae</i>	Least Concern
	<i>Orthochromis malagaraziensis</i>	Vulnerable
	<i>Orthochromis spp.</i>	-
	<i>Parakneria spekii</i>	Least Concern

SITE	Species	Conservation Status
	<i>Polypterus ornatipinnis</i>	Least Concern
	<i>Schilbe moebiusii</i>	Least Concern
	<i>Varicorhinus leleupanus</i>	Vulnerable D2
Ruchugi River	<i>Acapoeta tanganyicae</i>	Least Concern
	<i>Anguilla mossambica</i>	Near Threatened
	<i>Chiloglanis somereni</i>	Least Concern
	<i>Clarias gariepinus</i>	Least Concern
	<i>Garra dembeensis</i>	Least Concern
	<i>Hydrocynus goliath</i>	Least Concern
	<i>Hydrocynus vittatus</i>	Least Concern
	<i>Malapterurus electricus</i>	Least Concern
	<i>Mormyrus kannume</i>	Least Concern
	<i>Oreochromis jipe</i>	Critically Endangered
	<i>Oreochromis karomo</i>	Critically Endangered
	<i>Orthochromis uvinzae</i>	Critically Endangered
	<i>Petrocephalus catostoma</i>	Least Concern
	<i>Plectorhynchus playfairi</i>	Least Concern
	<i>Protopterus aethiopicus</i>	Least Concern
	<i>Synodontis afrofisheri</i>	Least Concern
	<i>Synodontis granulatus</i>	Least Concern
	<i>Synodontis nigromaculatus</i>	Least Concern
	<i>Varicorhinus leleupanus</i>	Vulnerable D2
	<i>Varicorhinus platystoma</i>	Critically Endangered
	<i>Yongeichthys nebulosus</i>	Least Concern
Suleke River	<i>Barbus amphigramma</i>	Least Concern
	<i>Barbus paludinosus</i>	Least Concern
	<i>Oreochromis niloticus</i>	Least Concern

Luiche River: This site is characterized by relatively large and deep water, runs, soft steep banks dominated by phragmites, young and mature palm trees. It is a location where the SGR crosses the Luiche River (Plate 4-21.21).



**Plate 4-21: Luiche River where the SGR crosses the river.**

#### 4.9.2 Existing water quality conditions

Alteration of water quality variables; hydrological, hydraulic, sedimentation (turbidity or Total Suspended Solids), temperature, pH, conductivity, dissolved oxygen, salinity and nutrient concentration may impact the ecosystem characteristics and hence aquatic biodiversity. The impact is assessed by the extent of the change and the sensitivity of the respondent organism. Five environmental variables (pH, temperature, turbidity, EC, Turbidity, Total Nitrate and Total Phosphate) as a measure of water quality were recorded were used to characterize potential trophic conditions influencing aquatic biodiversity and fish distribution at each site. To understand and elaborate these environmental parameters, environmental standard values are important, these standards and have been retrieved from various sources. A summary of some environmental variables' standards considered in this study is shown in Table 4-15.

**Table 4-16: Environmental standards for freshwater aquatic ecosystems**

Variable	Standard	Description	Source
Temperature	< 28°C	Must not exceed the modelled temperature	Srebotnjak et al . (2012)
Dissolved Oxygen	6- ≥ 9.5 mg/L	Must not be less than target when the average water temperature is > 20°C	Srebotnjak et al. (2012)
		Must not be less than target when the average water temperature is ≤ 20°C	Carr & Rickwood (2008)



EC	≤ 500 µScm-1	Must not exceed the target	Srebotnjak et al . (2012)
			Carr & Rickwood (2008)
Turbidity	5 NTU	Must not exceed target	Al-Janabi et al . (2012)
Total Nitrogen	2-6 mg/L		EPA 2012
Total Phosphate	0.05- 0.1mg/L		EPA 2012

#### 4.9.3 Biodiversity loss

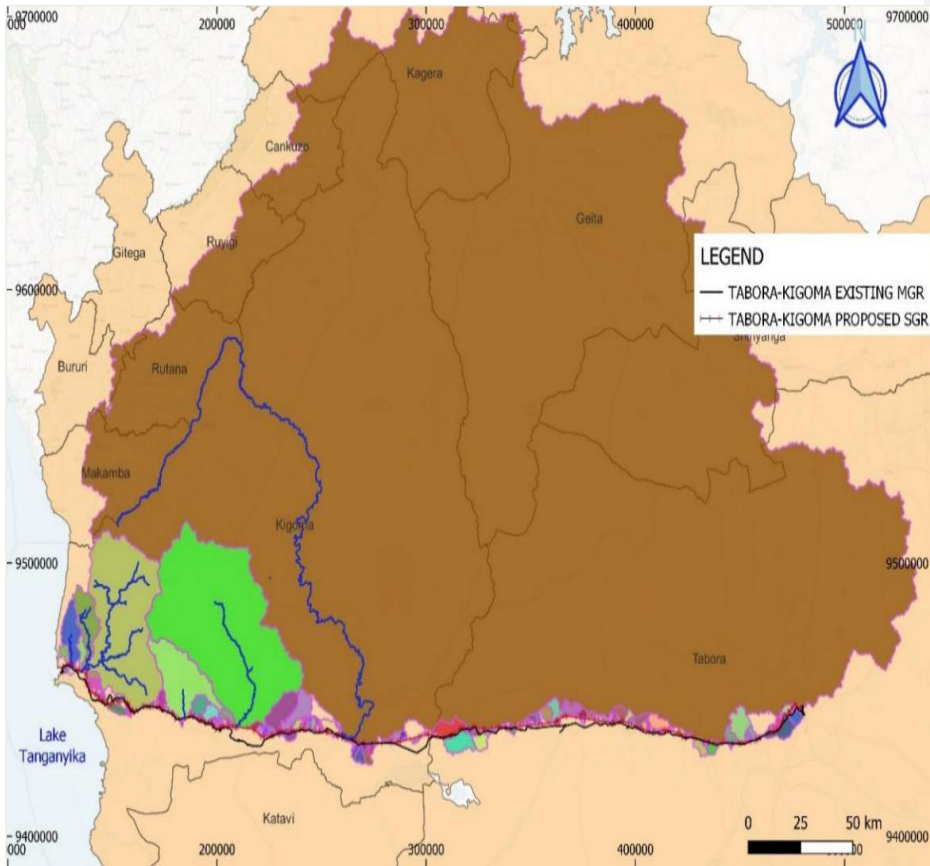
The Malagarasi Swamp is a Ramsar site composed of several endemic species of fish and critically endangered species. Construction that will involve clearing of wetland vegetation, and removal of earth material from river banks and marsh vegetation may result into significant loss of aquatic habitats, important as spawning, nursery, refuge and feeding grounds for fish and other aquatic organisms. Significant loss to biodiversity will also contribute to loss of species recognized by IUCN as critically endangered and vulnerable.

### 4.10 HYDROLOGY AND HYDRAULIC

#### 4.10.1 The Background

The SGR project passes through the Kigoma and Tabora administrative regions. It passes through various topography which are Marshes, River valleys and flat areas. The project is located mainly in Malagarasi River Basin which is located in the Lake Tanganyika Basin. From Tabora to Kaliua the project passes close to the watershed of the upper Malagarasi. The Malagarasi is the second longest river in the country, with a length of 475 kilometers, and with a basin area of 130,000 square kilometers, the Malagarasi has the largest watershed of all of the rivers flowing into Lake Tanganyika. It is one of the lake's primary inflows. Moyowosi River is the principal tributary, along with its affluent the Nikongo River; other tributaries include Ugalla River, Gombe River, Ruchugi River, Lumpungu River, and Nguya River. The flow of the river ranges dramatically between the annual cycle of wet and dry seasons, and at times may be susceptible to flooding or reduced to a small stream; flow is also affected by local agriculture and deforestation which increase the level of sediments within the river.

The detailed map of the major basins was developed in Q-GIS and the results are presented Figure 4-17:



**Figure 4-16: Location of the project showing the major basins and rivers within the administrative regions**

#### 4.10.2 Calculation Methods and Principles of Hydrology

##### 4.10.2.1 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.

#### 4.10.3 Calculation Methods of Hydrology

Detail design procedures and requirements: Hydrological –Hydraulic Report which shall summarize hydrological and hydraulic analysis/calculations together with the assumptions and criteria used for the design of drainage structures, waterway openings, major watercourses, etc.

The drainage patterns investigated are the major and minor rivers that tends to interact with the project. The SRTM DEM data were used to obtain the streams which were compared to the existing streams in OSM Map. The STRM DEM was found to be satisfactory to predict the location of the streams hence it was decided they shall be used for the preliminary catchment study.

The catchment delineation was performed using QGIS. QGIS utilizes the obtained stream intersection with the alignment and search for a nearby point with largest flow accumulation. By varying the search radius this method can be used to delineate many catchments quicker and more accurately.

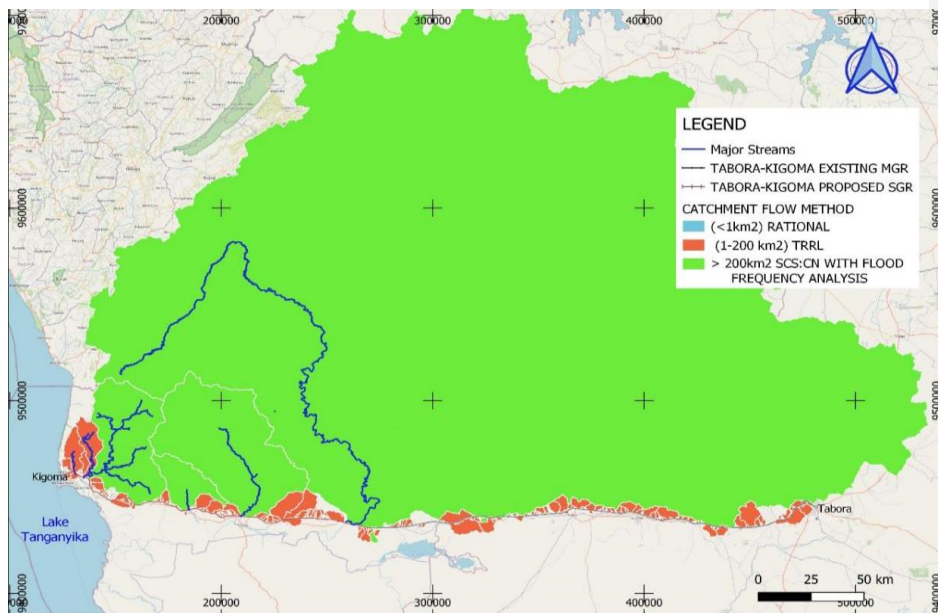
The Catchments obtained were classified into three categories, for each category a suitable method for flow calculation was proposed:

The Rational Method for catchments between 1.0 square km or where drainage flow distance is less than 1 km.

The “Transport Road Research Laboratory (TRRL) East African Flood Model” for catchments larger than 1.0 square km but less than 200 square km.

If catchments larger than 200 square km are encountered, SCS method, developed by U.S Soil Conservation Services will be used according to AREMA manual.

The Figure 4-18 shows the catchments categorized by their respective area and method of flow calculation.



**Figure 4-17: Catchments along the project and the anticipated method of discharge calculation**

## 4.11 SOCIO-ECONOMIC CHARACTERISTICS

### 4.11.1 Methodology

This study applied different participatory methods to involve all the concerned stakeholders. Interviews were held with main stakeholders at Regional, District, Ward and Village levels as well as relevant Institutions, which will be influenced by the construction of Standard Gauge Railway – SGR.

Consultations were conducted with district management team from Tabora and Kigoma municipal councils, Kigoma District council, Uyui District Council, Uvinza District Council, Kaliua District Council, Urambo District Council and Village Development Committees (VDC) with the respective villages that will host the SGR project and where the project activities will be conducted.

In addition, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted with different groups who have different background and knowledge of the area. These included Men, Women, Youths and Vulnerable groups in the community surrounding the project area. Similarly, literature review in terms of reports and documents was also conducted

Among other topics, the interviews covered issues on the socio-economic situation of the areas and general opinion and expectations of the stakeholders on the SGR lot 6 project activities were gathered.



**Plate 4-22: SE meeting at the community level.**

#### 4.11.2 Location and boundary

Tabora Municipal Council is located between 4° 52' and 5° 9' latitude South and 33° 00' East. Most of its part lies between 1000m above sea level. It is surrounded by Uyui district in the Western, Northern and Eastern parties and Sikonge district in the South whereas Uyui district is among the seven districts of Tabora region. Most parts of the district are located at the central part of Tabora region, and surround Tabora Municipal Council. The district, however shares borders with Igunga and Nzega districts in the North, Sikonge district on the South, Urambo and Kaliua on the West, while Singida region lies on the eastern side of the district in terms of international identification. The district lies between 05 045'' and 06 055'' south of the Equator and between 32085'' and 34015'' east of Greenwich and a total surface area of 11,806sq.Km.

Urambo District Council is one of seven districts in Tabora Region, established on 1<sup>st</sup> January 1984. It is located 90 kilometers from Tabora Municipa council. The District is bordered with Kaliua district in the North and West, Uyui district in the East, Sikonge district on the South, Rukwa and Katavi regions in the South-west. In terms of international identification, the district lies between longitudes 31° 450' and 32° 300' East of GMT and between latitudes 4° 420' and 5° 460' south of the equator whereas Kaliua district council is among the seven districts of Tabora region and was established on 2nd march, 2012 and start functioning on 14th August 2013. Before that time, it was part of Urambo district. The area was then found to be too big to remain under the same district (Urambo) as it was hampering the delivery of quality administrative services. The headquarter of Kaliua district is located at Kaliua town, 125 km from Tabora municipal council.

Kigoma municipal council is one of the eight administrative districts of Kigoma region in Tanzania. The district covers an area of 92.7 km<sup>2</sup> (35.8 sq mi). It is bordered to the west by Uvinza district in the south east and to the north by Kigoma district, the western shore of lake Tanganyika surrounds the district on the west. According to the 2012 census, the district has a total population of 215,458 whereas Uvinza district council is among the councils in Kigoma region which has been established under the Local Government Authority Act.7 of 1982. The Council covers an area of 10,178 square km of which 6,425 sq km are covered with water mainly Lake Tanganyika and big swamps at Nguruka. The council borders with Tanganyika District in Katavi region in the southern part, Kaliua district in Tabora region in eastern part and Democratic Republic of Congo (DRC) in the western part, Kigoma and Kasulu district in Northern part. On district basis, (the largest proportion of the area is in Uvinza district council. Uvinza district council covers 26.4 percent of the total regional area and Kigoma Ujiji municipal Council is the smallest with only 0.3 percent of the total regional area.

#### 4.11.3 Climatic Features

Tabora municipal council has a mean temperature which ranges from 22°C to 26°C. Highest temperature occurs in October prior to the start of rainy season and falls gradually in December and remains relatively constant until May. Between May and August temperatures are at the lowest levels whereas Uyui district receives rainfall of between 750mm and 950mm annually falling between the months of October or November to February or March and a second lower

peak occurs in February or March and the rains then tail off in April or sometimes in May. Uyui district forms part of the vast central plateau of Tabora region, an area of flat and gently undulating plains broken in places by prominent hills. Most parts of the district lie between 1,100 meters and 1,200 meters above sea level and form the main water shed separating rivers flowing north eastward into the Manonga River and the Wembere.

Urambo district receives rainfall of between 600mm and 1,000mm annually, falling between the months of October or November and December and a dry season from January to February or March and a second lower peak occurs in February or March and the rains then tail off in April or sometimes May whereas Kaliua district receives rainfall of between 900mm and 1,300mm annually, falling between the months of October or November and December and a dry season from January to February or March and a second lower peak occurs in February or March and the rains then tail off in April or sometimes in May.

In Kigoma municipal council, the average rainfall received ranges from 860 mm to 1200 mm, in Kigoma municipality, 600 mm to 1200 mm in Kigoma district council. The heavy rainfall covers 120 days between March and June every year and spreads throughout the region. The light rainfall has been received for 60 days and common from October to December each year. However, the light rainfall does not cover the whole region and is very unreliable. The heavy rainfalls are used for cultivating crops that require more moisture such as paddy and maize. On the other hand, short rainfalls are used by smallholder-farmers to cultivate crops that require less moisture and they contribute about 15% of the cereal production. Apart from that, the interpretation appeals that smallholder-farmers would be practicing intensive farming in areas with large coverage of rainfall in terms of days.

#### **4.11.4 Administrative units**

Tabora municipal council administratively is divided into 2 divisions, 29 wards, 136 streets, 41 villages and 159 hamlets. Also the Council has one constituency ie. Tabora Urban. There are 36 councilors out of which 29 are elected ones and 10 are appointed as special seat representatives whereas administratively, Uyui District is divided into 3 divisions and 30 wards with a total of 156 villages distributed unevenly. Igalula division covers about 67% of total land area of the district followed by Uyui division accounting for about 18% of total land area. Ilangulu division has the smallest land area in the district constituting only 15% of the total land area. Being one of the 7<sup>th</sup> districts in Tabora region, Urambo District administratively has two divisions namely, Urambo, and Ussoke; 18 Wards, 59 registered villages and 256 hamlets.

Administratively, Kaliua district is divided into 5 divisions and 28 wards (three of these being for refugees) with a total of 99 villages (13 of these being in the refugees wards) and 348 hamlets distributed unevenly whereas administratively, Uvinza district council is divided into three divisions, namely Ilagala, Buhingu and Nguruka, 16 Wards, 61 registered villages and 330 hamlets.

#### 4.11.5 Population Size, Growth, Density and Spatial Distribution

Based on 2022 national population census, Tabora municipal council has a total population of 308,741 whereas Kigoma municipal council has a total population of 232,288.

Unlike other districts in Tabora region, the population of Uyui District has experienced significant growth. According to the 2022 Population and Housing Census, Uyui district had 562,588 people out of which 276,261 were males and 286,327 were females. Compared to the 2012 Population and Housing Census the district had 396,623 people resulting to an increase of 165,965 people during the respective period.

According to the 2022 National Population and Housing Census, Urambo district has a total population of 260,322 (Males 127,424 and Females 132,898) and its density thinly spread at 43 people per Km<sup>2</sup>. The population growth rate is 3.2 percent per annum whereas the population of Kaliua District has experienced significant growth. According to the 2012 Population and Housing Census the district had 393,358 people with an average annual growth rate of 4.8 percent and household size of 6 people during the census period. Out of these, 196,369 are male and 196,989 are female. The estimated population for 2019 put the district population at 546,156 persons out of which, male account for 49.9 percent of the population or 272,532 and female 50.1 percent or 273,624 people.

#### 4.11.6 Ethnic Groups

The ethnic groups in Tabora Municipal are the Africans and in small proportion there are Arabs, Indians, and Europeans. The main tribes found in greater proportion are Nyamwezi, Sukuma, Tutsi and Ha whereas Uyui district council has two main ethnic groups namely: Nyamwezi and Sukuma. The majority of Sukuma occupy the northeastern part of the district which covers Lutende, Loya and Kizengi wards, while the Nyamwezi occupy the rest parts of the district. In addition to that, the district is also occupied by a small group of Bahain Ufuluma ward.

Urambo District Council's main ethnic groups in the District are the Nyamwezi, Ha, Sukuma, Fipa and Nyakyusa.

Kaliua District has five main ethnic groups namely: Nyamwezi, Sukuma, Ha, Fipa and Sumbwa. The Sukuma mainly occupy the north eastern part of the district which covers Uyowa, Kashishi, Kazaroho and Igagala wards, while the Nyamwezi occupy most of the district. In addition, the district is also occupied by a small group of Ha in Usinge and Igalala wards, Fipa in Ukumbisiganga ward. Kanindo, Milambo and Igombenkulu wards are occupied by refugees from mainly Burundi.

#### 4.11.7 Major Economic Activities

Tabora municipal economic base depends mainly on administrative services by both central and Local Government Authority. Since it is a dominating sector, it does not suffice the supply of labour for the production of economic goods and Services, hence this affects the employment rate, income level, Consumption capacity and investments of Tabora Municipality residents whereas in Urambo District Council, Main economic activities in Urambo District include agriculture, livestock and beekeeping and trading activities. These activities contribute to

District's GDP and per capita income to Urambo residents. Agricultural sector employs approximate 78 percent of the adult population.

Most of the people in Uvinza District are farmers (peasant farming) using un-mechanized farming tools, though Agriculture is an important sector in the development of the economy. The area suitable for agriculture and animal husbandry is 698,265 Ha.

#### 4.11.7.1 *Agriculture*

Agriculture is the predominant economic sector in Tabora Municipal council. It is dominated by small holders who use hand and few Use plough and tractors. The bulk of agricultural production comes from small holders who invest in very little capital. The main inputs are labour, land and fertilizers (Chemical fertilizers). Respite the important role agriculture plays in the economy and development there is a great deal of unutilized potentials. The Municipality is estimated to have 81,900 hectors of potentially cultivated land for both food and cash crop farming like cassava, Maize and Tobacco but only 31,973 hectors are under cultivation.

In Urambo district council, Agriculture is the main productive economic sector being practiced in Urambo District. Both Crops cultivation and Livestock keeping are the main income earners for Urambo Community. Major crops cultivated include tobacco, maize, rice, sweet potatoes, cassava, sun flower, beans and variety of vegetables plus tropical fruits such as mangos, oranges, pawpaw, cabbages, onion and tomatoes. Tobacco is the major cash crop which is carried out through contract farming and it attracts many international buyers during agricultural season. The crop contributes much to local economic development and country at large. Urambo district council has also waged out efforts to expand cotton production in all 18 wards of Urambo District Council. The district however is lacking notable industries such as tobacco processing and that of the nature in grain processing.

Agriculture is Kaliua's largest economic sector. It employ about 85 percent of the adult population. Annual crops such as tobacco provide most of the cash income followed by off-farm income, tree/forest resources, livestock keeping, permanent crop farming and remittances. The three main problems affecting the growth of agriculture sector in Kaliua is the use of inferior agricultural implements, high cost of inputs and difficulties in accessing land. Maize and paddy are dominant staple food crops grown through small scale farming. Production of cassava and beans in Kaliua was much higher than other district in Tabora region. Moreover, the district had the second largest area planted with oil seeds especially groundnuts. Vegetable production is not very important and the vegetables produced are tomatoes followed by amaranths and onions. Tobacco is the major cash crop of which among districts in Tabora, Kaliua produced the largest quantity. Cotton is another cash crop though grown in small quantities. Kaliua District has a total area of 19,200ha suitable for irrigation. However, only 1,950ha equal to 10.1% is under traditional irrigation. Irrigation is implemented for horticultural crops especially tomatoes, onions, vegetables as well as cereal crops (maize and paddy). Wards which have area suitable for irrigation include Kazaroho, Igwisi, Ushokola, Uyowa, Sasu, Seleli and Usinge. In Kaliua, the most common source of water for irrigation is wells using hand bucket. Bucket/watering cans was the most common means of irrigation water application and a small amount of flood irrigation was used.



The major farming mechanism in Uvinza District is based on maize-bean system in the highlands, maize - Tobacco in the low lands and cassava – paddy in the Lake shore. Agriculture is the main source of income because it contributes up to 91% of the District income. Cash crops include tobacco and oil palm while maize, cassava, beans, paddy are food crops and sometimes are used as cash crops. Tobacco is the major source of income in the lowlands. On Lake Tanganyika shore, fishing is the major source of income, especially in Buhingu Division, and part of Ilagala, while cassava is a staple food crop in the area. Major cash crops are; Tobacco, Paddy and Oil palms, while major food crops are; Maize, Beans, Cassava and Paddy.



**Plate 4-23: A farm of palm trees in Chakulu village**



**Plate 4-24: Cotton in Kaliua and Urambo District**

#### 4.11.7.2 *Livestock keeping*

Livestock keeping is another economic activity taking place in the Municipal Council. The climate and environmental conditions are favorable for livestock keeping. The most important type of livestock kept are cattle, sheep and goats. The cattle population is comprised of

indigenous breed the majority being Tanzania short horned zebu but there are few animals improved breed. The percentage of people engaged in agriculture activities is 50% of the Municipality residents.

In Urambo district council, Livestock are important for subsistence by providing meat and milk to enrich diet. Livestock keeping is among the two major economic activities in Urambo district. One is crop production the second is livestock keeping. Chicken are the dominant livestock type in the district followed by cattle. Chicken contributed 48.2 percent and cattle 26.2 percent of the districts' total livestock population of 701,715 in the season of 2011/12. Urambo district frequently experiences land use conflicts between pastoralists, crop farmers and also with TANAPA due to desertification of natural forests reserves. Shortage of grazing land is the most pressing issue for pastoralists in the district. In order to rescue their livestock from starving, livestock keepers encroach forests/game reserves and farms to feed them.

In Kaliua district, livestock are important for subsistence by providing meat and milk to enrich diet. Livestock keeping is among the two major economic activities in Kaliua district. One is crop production the second is livestock keeping. Chicken are the dominant livestock type in the district followed by cattle. Chicken contributed 49 percent and cattle 27 percent of the districts' total livestock population of 467,578 in the season of 2013/14. Kaliua district frequently experiences land use conflicts between pastoralists, crop farmers and also with TANAPA due to desertification of natural forests reserves. Shortage of grazing land is the most pressing issue for pastoralists in the district. In order to rescue their livestock from starving, livestock keepers encroach forests/game reserves and farms to feed them. From the total livestock population of 467,584, poultry which accounted for 49 percent of total livestock was the most populous livestock in the district in 2013/14. Cattle population was the second at 27 percent followed by goats at 17 percent. Donkeys are among the livestock of the least economic importance in 2013/14 as accounted for only 0.08 percent of the total livestock. Proportion of livestock by ward reveals that in 2013/14, the best three wards in livestock keeping were Sasu (the leader at 17 percentage share of total livestock in the district) followed by Seleli (14 percent) and Kashishi (11.5 percent).

Most of the farmers in Uvinza District in Kigoma practice both crop production and livestock keeping. The number of livestock in Uvinza District is considered as the lowest in Kigoma Region, and ranks among the lowest when compared to other Regions in the Country. According to 2010 District Data, Livestock kept in Uvinza District are Pigs (3,252), Cattle (30,218), Goats (217,228), Sheep (21,815), Duck (12,597) and Poultry (201,450). However, the number and quality of the livestock kept has remained low compared to the high population growth of the District and the demand by consumers.



**Plate 4-25: Picture of Cattle at Malagarasi village**

#### 4.11.7.3 *Industries*

Currently Tabora Municipality has had little industrial development as compared to other Municipalities, according to the Town and country planning Act. Cap. 378 (use classes) they have three categories of industries;

##### **i. Special Industries**

These are industries including storages which may be offensive by reason of smell, noisy OR fumes or dangerous by reason of the use and storage of dangerous or inflammable materials or inimical to public health by reason of vermin or other courses. For that reason they have only two industries in Tabora Town which are meat plant and petroleum depots.

##### **ii. General Industries**

These are industries which do not fall under special or service industries or do not require segregation from general industries. In Tabora Municipality these includes the Tabora Textile, Tabora Timber supplies, Tabora saw mills, Tabora Builders Saw Mills, Azimio cottage (SIDO), Mpembampazi saw mills, Railway corporation Locomotive Workshop, TMP printers, Tobacco processing factories and Ugala saw mills.

##### **iii. Service Industries**

These are small scale industries serving the day to day need of the Local population. Most of the industries in Tabora Municipality fall under this category. These includes small scale milling of grains, workshop for Radio, mechanics, motor vehicle light repairs and servicing, honey processing, oil seed and tinsmiths.

Urambo district has a total of 309 local processing industries including The manufacturing sector is at its infancy stage with few exploited areas whereby unprocessed agricultural

commodities have dominated major ex-ports. The sector contributes to the Tanzania economy through revenue collection of import and export sales, corporate tax, and income tax, contributing foreign exchange to the government, third after agriculture, and tourism. The activities consist of manufacturing simple consumer goods like food, beverages, textiles, tobacco, wood products, rubber products, iron, steel, and fabricated metal products.

This sector offers a wide range of opportunities to both potential local and foreign investors. Some areas of investments involve:

- i. Fruit/Vegetable Processing: Urambo is richly endowed with a large variety of fruits and vegetables. There is a room for large scale production of a range of tropical as well as temperate fruits and vegetables
- ii. Processing and canning factories in wards with high potential for production of fruits and vegetables
- iii. Open fruit and vegetables plantations for domestic and export markets.

**Leather:** Leather sector offers huge investment opportunities for manufacturing. The region produces raw hides and skins annually. Opportunities in this area include putting up modern tanneries and leather finishing production units.

For Kaliua district; Kaliua like the rest part of the county, informal sector plays a major role in socio-economic development of the district. The small scale industries such as oil processing, carpentry, food processing, welding, garages, manufacturing industries and timber processing contributes to some extent in increasing employment opportunities and reducing income poverty in the district. Unfortunately, unreliable electricity power supply, poor road infrastructure and lack of skills/technology of informal sector operators contribute slow growth of this sector in the district.

#### 4.11.7.4 *Fisheries*

In Tabora Municipality, fishing at Igombe dam and Walla River is practiced at small scale and mainly for Local consumption and informal trade. Small amount of fish is brought to the town market where also fresh fish (unprocessed) sales are done. The dominant type of fish caught at Igombe is Tilapia and slight amount of catfish. Many small scale fishermen make their living from fishing as source of employment and income.

Urambo district council has no lake for fishing it has only two rivers (Walla and Ugalla) which are used for fishing. Also it has large number of man-made fishing dams which are owned communally or individually.

In Kaliua district, Small scale fishing practiced in the district is merely for economic and domestic consumption. Fishing takes place mainly in Ugalla, and Igombe rivers which are permanent rivers. Likewise, fish farming is very common in Lake Sagara. Imported fish from Nguruka in Kigoma region supplements fish shortage in the district. Table 3.25 gives indications of the magnitude of the fishing industry in the district. In 2013/2014, the district had a total of 870 fishermen. Out of them, 869 fishermen (99 percent) had no licenses. In the respective year, fish weighing 793,658 kg valued at Tshs. 992,072,500.00 were harvested. The average price per fish ranges from Tshs 1,000.00 to 1,500.

In Uvinza District Council, Fishing industry plays an important role in the economy of the District. Fishing activities are mainly carried out in Lake Tanganyika which has an area of 6,425 km<sup>2</sup>, Small Water bodies of Lake Sagara and Nyamagoma, Rivers Malagarasi, Ugalla, Luguvu and Kandaga pond. There are about 10,000 full and part-time Artisan fishers using over 2,000 Built canoes according to 2009 Fisheries statistics. Fish catches in 2008 was 50,195 tons, which fetched a total amount of Tshs. 52,722,337,301/=. This is below a maximum catch by 65,000, tons. The species abundantly caught are Sardines (Dagaa) and Lates (Migebuka). The District has 19 fishing villages with 997 operational fishing crafts and 7,801 fishers. Uvinza District is also famous for the production of aquarium fish for export to Europe and elsewhere in the world markets. It produces about 10 tons per annum. There are only 1 Company in the District that practice this type of fishing.

#### 4.11.7.5 *Forestry*

Forestry contributes significantly to the economy of Tabora Municipal council. The coverage of forested areas is about 18,877.2 Ha which is about 17% of the total Municipal area. There are 3 forest product based industries in Tabora Municipality which are in proper working condition. These include Tabora Timber supplies, Tabora Saw Mills and Tabora Builders Saw Mills. In Tabora Municipality forests provide a wide variety of non-wood products such as bee keeping activity, which contributes to the economical trend of the country when it is properly managed. Also honey bees play an important role in pollinating agricultural crops. There are game animals in forest areas such as in forest reserve and public lands where there is no cultivation, settlements, grazing and tree falling.

In Urambo district, the largest part of the district area is covered by forest. Therefore, there is a room to invest in the following: Wood processing industries (furniture, briquettes, ceiling boards and chip-boards), Wild Fruits processing industries. Hand crafts and Timber trade industry.

Kaliua district, Land and forest resources are the main natural endowments of Tanzania. However, it has been noticed that the country's forest area has been declining. Kaliua district being part of Tanzania also experiences the same problem. Causes of this decline in the district are mainly agricultural expansion, fuel wood utilization and tobacco curing in tobacco growing areas, over grazing, wildfire, over exploitation of wood resources for various purposes and other human activities.

Uvinza District Council is endowed with a lot of National Forests such as; Lugufu (5,439 Ha), Ilunde (5,997.50 Ha), Basanza (12,850 Ha), Uvinza (16,835 Ha), Mpanda line (35,612 Ha), and Apart of these there is one forest reserve known as Rukunda – Kachambi (11,991.70 Ha) which is a Forest Reserve under Uvinza District Authority.

#### 4.11.7.6 *Mining Activities*

There are no potential mineral deposits in Tabora Municipality. Mining activities are comprised of building minerals extraction which involves stone quarries for supply of stone

and sand extraction for supply of sand for the building industry. Other activities include extraction of clay soils for production of bricks for construction.

**Table 4. Data on income contribution within the Tabora Municipal Council by %**

Agriculture	Trade and Industry	Livestock	Minerals and energy	TOTAL
49%	13.5%	34%	3.5%	100%

Uvinza District is rich in mineral resources, which some of it are not well exploited. The famous mineral resources found in the District include; Salt, Platinum, Gold, Galen, Copper, Limestone and Nickel. Salt is mined at Uvinza Ward, about 110 Km from Kigoma Town with an average of 50,000 Tons production per Annum. Platinum and Nickel is potentially available at Mgambazi, Galen and Copper obtained in Ilagala Ward, Limestone in Kazuramimba, Simbo and Ilagala wards, and Gold in Kalya and Buhingu Wards. These mines are not optimally explored. For instance some companies are still running explorations such as INCO of Canada, Anglo-America, BHP Mineral exploration, BILGEO of China, Goldstream Mining of Australia and Lonmin of England.

#### 4.11.7.7 *Wildlife*

Urambo district recognizes the important role that tourism and infrastructure can play as impetus for economic growth and development in the district and, has the potential to create employment for the local community as well as to significantly contribute to economic growth, diversification and transformation, social development and uplifting in the region. The district is endowed with plenty of wildlife whereby there are two hunting blocks (UWIMA and North Ugalla). Wildlife provides plenty of investment opportunities in this district. Considering the fact that wildlife conservation areas are remotely located, management and utilization of wildlife requires the following investments:

- i. Transportation (Air charter services, luxury road transport services to all wildlife protected areas).
- ii. Accommodation and Catering (hotels, guesthouses, restaurants, cafes and fast food outlets).
- iii. Visitor use facilities (e.g. tented camps, campsites etc.)
- iv. High profile water sports (diving, scuba diving, water skiing, sport fishing, boating etc.)
- v. Foodstuff production and supply for hotel catering

Uvinza District is one of Mega biodiversity District in Tanzania. It is rich in wild animals especially Elephant, Bushbuck, Crocodile, Sable, Hippo, Lions, Leopards, Monkeys, Buffaloes, Shoe bill and Wattle crane. It is one of the Districts that posse larger numbers of endangered wild animals like Chimpanzee, Shoe bill, and Wattle crane. The District have one National Parks (Mahale), five Forest Reserves (Lugufu, Ilunde, Basanza, Uvinza, and Mpanda line which covers an area of 118,303.50 Ha. One Game Reserve (Moyowosi - Kigosi), two game controlled areas (Mfubasi and Luganzo). The other areas of interest are; the Wetlands

(Malagarasi – Moyoyosi Ramsa site). Overgrazing, Charcoal making, Timber logging, Illegal fishing and Game poaching create major threats to biodiversity sustainable development.

#### 4.11.7.8 *Bee-keeping*

Urambo District council has a large potential for the establishment and management of bee reserves. Beekeeping plays a major role in socio – economic development and environmental conservation. It is a source of food (honey pollen and brood); raw materials for various industries, medicine and income for beekeepers. The sector’s contribution to the GDP is 1%. It is a source of employment, provides income to the people, a source of recreation, ecotourism and foreign exchange earner.

For Kaliua district; Beekeeping is one of the economic activities in Kaliua. It is among the districts in Tanzania that are known for honey and bee-wax production. Natural forests and forests plantations available in most parts of the district have great potential for beekeeping. Besides those endowments, beekeeping sub-sector is still under developed due to lack of know-how and modern technology. In 2014 traditional beehives numbering 75,041 (98.2 percent of total beehives in the district) were very prominent than modern beehives (1,392, 1.8 percent of the total beehives). But this situation led to low production of honey and bee wax within in the district. Tradition beehives are mainly made by carving logs whilst modern beehives are more improved and made by timber. On top of that, if the available beekeeping potential is fully utilized, it would reduce unemployment/underemployment of rural population in the district. In Uvinza District, Bee-keeping is done on a small scale in the villages and it is now gaining momentum due to the training given to villagers and village leaders on the importance of bee-keeping in the economy. Comparatively, honey and bee wax production has increased from 48.9 tons and 3.2 tons to 102.4 tons and 7.2 tons in 2008 and 2012 respectively. Still the production needs to be increased as in and outside demand is higher than the production.



**Plate 4-26: Traditional beehives in Mwamila village**

#### 4.11.7.9 *Tourism*

For Kaliua district; Presence of Ugalla and Kigosi game reserves as well Gombe and Luganjo game controlled areas make the district a potential area for hunting, photographic and viewing

tourism. Lion, buffalo, giraffe and elephants are some of the wild animals that can be seen in the reserves and game controlled areas. Since, tourist potentials available in the district are not well known, publicity initiatives need to be taken to bring the potentials into Tanzania tourist circuits. There historical sites that add potential sites for tourism in Kaliua Grave of the superior chief of Kaliua (Mtemi Mirambo) and also presence of cave which produce honey throughout the year give more opportunities for tourism in the district. Chief Mirambo of Nyamwezi tribe was born in 1820 and died in 1884 and buried in Ikonongo (Ulyankulu). Was the first chief of Kaliua. Ikonongo Ulyankulu was also the base of chief Mirambo. Moreover, the real name of Kaliua was 'Milambo'. Germans who arrived in the area in 1912 during construction of central railway line failed to pronounce the word 'Milambo' and so used to call it 'Kaliua'.

In Uvinza District Council, the tourist industry is least developed in Uvinza District despite the existences of several attractions such as; Chimpanzee and peculiar bird species in Mahale National Park, sandy and open Lakeshores.

#### **4.11.8 Economic Infrastructure**

##### **4.11.8.1 Road Transport**

In Tabora Municipal Council, Road transport is available connecting the town to other parts of Urambo, Nzega, Dar es Salaam and Sikonge. Paved roads are in the central area only and roads to peri-urban areas which need to be rehabilitated and constructed. There is a total of 66.12 kms of paved roads, 139.63 kms. of gravel and 420.15kms of earth roads which require periodic maintenance.

Urambo District has transportation network especially the main one to Kigoma and other town tarmac, gravel and earth roads. At most all parts in the District are reached by these roads especially during dry season and some few places like Makonkwa in Kiloleni Ward and Mlangale and Ukwanga in Songambebe ward are not reachable during rainy season.

For Kaliua district, road transportation is the major type of transportation for people and goods within and outside the district. It is one of the key sub-sectors that are responsible for sustainable development and poverty reduction initiatives in the district. Kaliua district is served by Regional roads, district roads and feeder roads. The length of road network by ward and by type of which there are is a total road network of 843.5kms in 2014. The roads in Kaliua district The roads that are maintained by the central government are classified as trunk or regional roads, while those that are maintained by the district council are called district or feeder roads; the rest of the roads are called peripheral roads and are mostly maintained by Village/Mitaa communities. This shows that about **262.4** km (31.1 percent of total road network) were regional roads, district roads were km **287.3** (34.1 percent) and urban roads were km **11** (1.3 percent). Feeder roads which are the true arteries of the economy constituted **282.8** km or 33.5 percent of cumulative total length of all roads in the district.



Uvinza District has a total of 624 km of road, out of which 233.1 km is trunk roads, 198 km is Regional Roads, and 390.9 km is District Roads. Currently, The Government construct tarmac roads from; Kigoma Town to Tabora via Uvinza and from Uvinza to Mpanda.

#### 4.11.8.2 *Railway Transport*

By location Tabora Municipal council has an advantage of surface transport as it is a junction of central Railway to Dar es salaam, Kigoma and Mwanza. This branch has been fortunate in that each one of Tabora region districts is served by Railway line except Igunga and Sikonge. The Tabora Municipal Council boasts of 38 kms. of Railway line.

Urambo district council has two main railway station found at Ussoke and Urambo other than small halts.

For Kaliua district; Kaliua district is very luck since the central railway line to Kigoma from Dar es Salaam passes through it. As the table below shows, there are 7 railway stations within the district. Initiatives done by the government to improve central railway line services would add value to the economy of the district.

Uvinza District is served with railway from Dar –es- Salaam to Kigoma via Tabora, about 1,500 km. The railway is very old, therefore it cannot render transport and transportation services as required. Much more effort is needed to rehabilitate rails, cabins and locomotives.

#### 4.11.8.3 *Air transport*

There is one airport in Tabora Town supported by 10 air strips i.e Igunga 1, Nzega 4, Urambo 4 and Uyui 1. The Tabora airport can service BOMBARDIER aircraft.

For Urambo district, there is one airstrip found at Urambo Town used by public and chartered planes saving the officials and investors.

For Kaliua district is served by one main air strip. The strip is not in a tarmac form and can accommodate only light aircrafts. However, there are no reliable data or records in terms of services provided and this is attributed to not having scheduled flights since the operation is performed occasionally by individuals.

Uvinza District Council has 3 Airstrips located in Uvinza, Nguruka and Buhingu (Mahale) wards.

#### 4.11.8.4 *Telecommunications*

Tabora Municipal Council has an exposure to cellular phone networks of TTCL, VODACOM, CELTEL, TIGO and HALOTEL. Within the municipal there are four radio stations that is Voice of Tabora (VOT) and CG FM, UHAI FM, UYUI FM. Also there is TV cable services of Tabora TV, Rage TV and California TV. Postal services are also available.

Most of the area in Urambo District is covered by one or more networks such as TTCL, Vodacom, Halotel and Airtel. However there are some parts in the Villages where are not well covered that you find some difficulties in communication, this vary from one village to another. Kaliua district enjoys internet, telephone services (cellular phone services) and postal services (Table 4.6). District headquarter (Kaliua ward) is the privileged area has it is well accessed with all the available services highlighted in Table 4.6. Peripheral areas access only cellular

phone services though with network coverage difficulties. Unfortunately, there are no television and radio stations operating in the district.

In Uvinza District Council, telecommunication services have improved in the last five years, where STD system was installed and to date Telex, Fax, EMS, DHL, Radio Calls and Cellular phones (Airtel, Vodacom, Tigo and Halotel, Zantel) facilities have been put in place. Easy communication is done in and outside the Country.

#### **4.11.9 Energy**

##### **4.11.9.1 Electricity**

In Tabora Municipal Council, there is a regular supply of electricity by TANESCO through the national grid. Investment is needed to make electricity available to peri-urban areas by Solar systems.

In Urambo District, electricity is the power source for domestic/commercial/institutions and industries premises. Urambo district is connected to the National grid where the power supply line connects all Wards.

In Kaliua ward, Electricity as energy is very important and much needed for economic development and where it is lacking; it becomes very difficult to engage in meaningful industrial development. TANESCO has continued to be the sole supplier of electricity in the district.

In Uvinza District Council, Suburbs are not well electrified, so as to enable electric intensive investment. However, efforts are being made to make Uvinza District poses electricity from National Grid (Tabora) and the establishment of Malagarasi electricity project at Igamba waterfalls is in process.

##### **4.11.9.2 Solar energy**

In Urambo district; Solar energy is available to few individuals with the financial ability to install. Some solar panels have been stationed in some of Secondary Schools and dispensaries.

In Kaliua district; there is no usage of biogas in the district, but can be used as an alternative source of energy in order to reduce the excessive use of fuel wood and charcoal for cooking purposes. Likewise, solar energy is now used as alternative source of energy in some parts of Kaliua district. To date there is no accurate data on the number of solar and generator users, however, it is estimated that there was at least a solar panel and privately owned generators in the district in 2013. Nevertheless, the district should continue encouraging people to use these sources of energy as alternatives to fuel wood and charcoal in order to reduce the pressure being exerted on forests by the local people.

##### **4.11.9.3 Fuel wood and charcoal**

Fuel wood and charcoal are the main sources of energy in Tabora Municipality. Fuel and charcoal are sources that account for about 95% of the total energy use. Fuel wood and charcoal are mainly used for domestic purposes and other activities such as brick burning

bakery and local brewing. Fuel wood is also used for tobacco burning in Urban Villages. Over 98% of the total population relies on fuel wood and charcoal as their main sources of domestic energy.

In Kaliua ward; fuel wood is a dominant source of energy for domestic consumption. The main use of fuel wood has been for cooking and lighting and this makes wood consumption very high in the district. This consumption level threatens the existence of forests since it seems to exceed the regenerative capacity of existing forests. Alternatives to fuel wood and charcoal had better be found soon if the district forests are to be saved from depletion on a progressive scale.

#### 4.11.9.4 *Fossil Fuels*

In Tabora Municipal Council, for domestic lightening, every household in the overwhelmingly large majority of cases in Urban and rural areas, depends on fossil kerosene, industry and transport needs for fossil fuels are also huge. The high cost of such fuels is holding back the fight against basic needs poverty.

### 4.11.10 *Social services*

#### 4.11.10.1 *Health services*

Health department has two major sections which are CURATIVE and PREVENTIVE. These are important areas of working within the department. Other areas are child immunization and pregnant mothers, food and drugs control, tuberculosis and leprosy control, HIV/AIDS, STI including voluntary counseling and testing of HIV. School health programme, IMCI, Malaria and lastly community Health fund and National Health Insurance Fund.

The health sector policy targets at:

- i. Rendering active participation and ownership of Health services to the community.
- ii. Achieve decision making, planning and implementation of health services at Municipal Council level.
- iii. Provide quality health services which are cost effective, gender sensitive and equitable distributions.

#### 4.11.10.2 *Health facilities*

Tabora Municipal Council has 43 health facilities including 3 hospitals, 2 private Hospitals, and 1 regional hospital, 3 health centers and 37 dispensaries. Among these facilities government owns 27 health facilities and 4 are owned by voluntary agencies while 20 are private. The population per facility is estimated to be for the hospital 1:207,000 for health centers, 1:207,000 and 1:5223 for dispensaries. There is still a need to have a district Hospital which currently is under construction, so as to reduce work load of the Regional Hospital.

For Urambo district council; there a total of 25 health facilities including 1 District Hospital, 1 Health Centre and 23 dispensaries of which 2 are FBOs. Even though the district has 225,664

inhabitants, the district hospital serves a total population of 586,139 majority of who are from the neighboring district of Kaliua, which do not have a district hospital at all.

Kaliua district Kaliua district is still improving the health sector by constructing new facilities. In 2014 there were 40 health facilities in the District (three health centres and 37 dispensaries. Looking at division level, the facilities are distributed evenly with health centres and dispensaries in Kaliua and Ulyankulu divisions. Looking at ownership, all facilities with exception of one health centre and five dispensaries are publically owned. The private participation in the provision of health facilities as emerged by the health policy is not significant. Looking at ward level, the district is still lagging behind in the implementation of health policy under which each ward has to have a health center and have a dispensary in each village. Table 5.1 shows that among 18 wards given in the table, only one Ward, Kaliua managed to implement the policy of one health centre per ward. Although they are in shortage, dispensaries were allocated in every ward.

#### 4.11.10.3 *Education*

In Tabora municipal Council, the main objective of education policy is to provide formal and informal guideline in primary and vocational schools to strengthen on job training program, to distribute teaching and learning materials. Also education policy aims at involving the community in managing and administering schools.

The department is responsible for:

- i. Monitor and supervise the implementation of policies in school pre-primary, primary school, adult education and post primary technical centers.
- ii. Coordinate and analyses Tabora Municipal Education data for Municipal Education Development.
- iii. Inspection of School Curriculum.
- iv. Coordinate, monitor, Supervise, administer and evaluate National Examinations for standard IV and VII.
- v. Promote, coordinate and supervise all sports and games competition at Tabora Municipal level.
- vi. Effect and coordinate the transfer of pupils within and outside Tabora Municipal.
- vii. Staff performance appraisal.

Tabora Municipal Council has 80 pre-primary schools, 82 Primary schools, 33 Secondary schools, 2 Teachers training College and 2 Vocational Training Centers. In Tabora Municipal, currently the number of pupils in 82 primary school is 61,725 among them 30,621 are boys and 31,107 are girls. Tabora Municipal Council has got a total of 33 Secondary Schools. Out of which 23 are public and 10 private schools. It has 2 Teachers Training College and 2 Vocational centers.

For Urambo district council there 77 Pre- primary schools with 4864 pupils, among these 2381 are boys and 2483 are girls. There 77 primary schools with a total of 52,755 out of these 26,935 are boys and 2582 are girls. The schools have 739 teachers. In general the requirement of

Teachers in the District is 1186 and therefore there is a shortage of 447 teacher's equivalent to 38%. There 20 secondary schools, out of which, 3 are private and 17 public based schools. The total enrollment is 7086 out of which 3544 are male and 3542 Female with 261 total numbers of teachers and therefore making a teacher student ratio of 1:27 Vocational training in the District is offered at the Urambo Folk Development College where there are currently 162 out of which 95 are male and 67 are female students.

#### **4.11.11 Water supply & Sanitation**

In Tabora Municipal, the main sources of water are Igombe and Kazima dams. The demand of water is about 22,500m<sup>3</sup> per day while the production from the two sources is about 17,400m<sup>3</sup> which is sufficient for only 79.6 % of the demand. This trend calls for efficiency in water treatment, storage and distribution so as to meet the demand of the expanding urban population. There is room for investment in this sector and currently the water from Lake Victoria is on the way to Tabora municipality.

Urambo district council District has a big problem of water availability; however the Government has a plan to connect Urambo with huge water projects of Lake Victoria from Tabora. Currently, the people obtain water through drilled boreholes, rain water harvest. There is 211 deep and 51 shallow well which provides water services in the district. There are 5 piped water projects operating in different areas including in Urambo town. The District has also constructed water supply project at Izimbili Village (Uyumbu) which supplies water services to 2 villages and also the water project from Lake Victoria is under the way the way. Water coverage in the District is 34. % capacity supply

Kaliua district has managed to supply water to some of her primary schools through water tanks, water wells and tap water. To reduce water shortage, rain water harvests done through water tanks are very common source water in primary schools. In 2014 rain water harvested through water tanks accounted 1.06 percent of the schools with water followed by water wells 43.6 percent and tap water is the least common source water in primary schools at 0 percent in 2013. However, half of the wards had no water in schools. Hence, only few primary schools have an access of water.

## 5 STAKEHOLDER ENGAGEMENT AND PUBLIC CONSULTATION

### 5.1 INTRODUCTION

This Chapter describes the approach used to identify and engage the identified stakeholders, and presents feedback regarding the potential impacts of the Standard Gauge Railway (SGR) project that were identified by stakeholders. The information presented herein is the result of interviews carried out by PaulSam Geo-Engineering Consulting Company Ltd (PaulSam) team of experts with stakeholders regarding the operation of the project. In response to the need of having stakeholders' responses, this activity was conducted to identify key environmental and social issues and concerns regarding development of the proposed project. Stakeholders were mainly involved in providing key baseline and detailed information which was used to inform the ESIA report. Specifically, the stakeholder's issues, questions and concerns were taken into account during the Environmental and Social Impact Assessment study. The PaulSam team helped to clarify key considerations related to potential social and economic aspects of the proposed project from local up to national level. The feedback and recommendations from stakeholders were obtained through review of documented information and a consultation process with affected stakeholders.

### 5.2 APPROACHES TO STAKEHOLDERS' ENGAGEMENT

The ESIA team made preparations for stakeholders' engagement (SE) prior to the actual site visit. They prepared a stakeholders' engagement plan in which they identified individuals, organization, business, family, governmental institution, indigenous group from various government administrative levels. The team outlined the environmental and social entities that could be impacted by the SGR project to be considered during the SE activities such as land use, vegetation, crops, livestock etc. that will be affected by the scope of the project. It is also sets the strategic communication plan. It is a step-by-step process that was used in outlining the communication mechanism with the stakeholders prior to the ESIA activity to increase the likelihood of positive ESIA outcomes. The plan goes hand in hand with the stakeholder identification and analysis whereby all important stakeholders were identified. Key Department and institutional officials who are direct or indirect beneficiaries of the SGR project were identified. These stakeholders, as outlined in Table 5.1 include among others: The National Environment and Management Council (NEMC), TANROAD, TARURA, OSHA, Fire Brigade, Tanzania Forest Service Agent just to mention a few.

Then the ESIA team determined the methodology and technique that will be used with each stakeholder. Then the principles and ground rules guiding the engagement with local communities and the program for consultation to ensure timely notification of consultation activities were made. Table 5.1 shows a list of identified stakeholders:

**Table 5-1: List of stakeholders identified**

LEVEL	STAKEHOLDERS
Private	Non-governmental organizations (NGOs)
Community members	Included; elderly, the youth, women, public servants, people living with disability and other vulnerable groups
Village and Ward Level	Village Development Councils (VDCs), Village Executive Officers (VEOs), Ward Executive Officers and Ward Committees (WDC)
District Level	District Executive Director (DED)
	District Administrative Secretary (DAS)
	District Council Management Team
	Tanzania Forestry Service Agency (TFS)
	Fire and Rescue force
Regional Level	TASAF
	Regional Administrative Secretary (RAS)
	TARURA
	TANESCO
	TPA
	TAWA
	Tanzania People's Defence Force (JWTZ)
	RUWASA
Zonal Level	TANROAD
	OSHA Zonal Manager
	Lake Tanganyika Water Basin Board
National Level	TANROAD
	Ministry of Mining
	National Environment Management Council (NEMC)

Source: PaulSam Geo-Engineering July, 2023

**Table 5-2: Sample distributions of stakeholders from national level to community level and their involvement**

Level	Stakeholders	Specified areas of interest	Remarks
National Level	NEMC	This is the National watchdog on environmental issues. This institution will be consulted to ensure implementation of the project is conducted according to the EMA, 2004.	Consultations and guidance will continue throughout the process of conducting the EIA and approvals.

Level	Stakeholders	Specified areas of interest	Remarks
Zonal level	OSHA	Responsible for Occupational Health and Safety (OHS) in the work place and the respective surrounding environment. Responsible for enforcing OHS Act No. 4 (2003).	The authority will be consulted to ensure that the developer (i.e. ATL) complies with the relevant legislation and is committed to OHS issues in the work place.
	Lake Tanganyika Water Basin Board	Responsible for protecting water resources assessment and monitoring, water resource allocation and water sources protection and pollution in the lake basin	Lake Tanganyika water basin board will be consulted every step of the project in case the project wants to establish sources of water such as wells, dams or comes across any water reserve
Regional Level	TANROAD	Responsible for the construction, care and maintenance of Regional roads, and the supervision of load carriage on roads.	Will be consulted in regards to road transport of materials and supplies that can be affected by the SGR construction activities
	RUWASA/TUWASA	Responsible for construction, supervising and regulating water supply services across Tanzania mainland.	The project construction activities can intervene with water infrastructure under RUWASA/TUWASA
	TANESCO	Responsible for the generation, transmission, distribution and supply of electricity.	The Project will require power for domestic use at the site area. The construction activities can also affect the infrastructure including the TANESCO lines and grids.
	TPA	Responsible for managing and operating the ocean ports and lake ports of the country of Tanzania.	The project will require consultation from TPA since their infrastructure can be affected with the construction activities
	TARURA	Provide sustainable and cost effective maintenance and development of Rural and Urban Roads Network to support the	The project will require consultation from TARURA on the road capacity and maintenance during construction of SGR



Level	Stakeholders	Specified areas of interest	Remarks
		social economic development of Tanzania.	
	Tanzania Wildlife Management Authority - TAWA	Improve the management and administration of Game Reserves and Game Controlled Areas.	Developer will consult TAWA to understand how their activities can impact TAWA
	Tanzania people's defence force - TPDF	Consulted because SGR will cross into their sites and can affect the safety and security of these areas	Will require to inform TPDF of the project and get their opinions on any infrastructure that can be tempered with such as military equipment and training areas.
	REME	Responsible for overseeing environmental protection in the region	Will require consultation since the activities will affect the environment directly.
	Regional Administrative Secretary, Tabora and Kigoma	In charge of community welfare, investment, community development and security in the whole Region.	The authority will be consulted on all matters pertaining to community development, welfare and Corporate Social Responsibility (CSR) issues.
District Level	DEMO	Responsible for overseeing environmental protection in the district	Will require consultation since the activities will affect the environment directly.
	DAS/DC	Responsible for is to assist the RAS in discharging administrative and human resources functions with the prime responsibility for supporting in all matters pertaining to administration, staffing, training and development, performance monitoring, social and welfare programs	Will be consulted since the construction activities can affect social and welfare of the community
	DED	Advise the Commander/Director in relation to budgetary processes, monitor expenditure and provide Divisional Managers	The developer will require consultation since DED is responsible for directly overseeing and managing the

Level	Stakeholders	Specified areas of interest	Remarks
		with advice and assistance with expenditure reviews	district's day-to-day operations, finances, and human resources.
	DPLO	Work in connection with the preparation, implementation and monitoring of local planning projects, projects within the Local Development Scheme.	The developer will require consultation since The developer will require consultation since
	DCDO	Working with community groups to deliver a range of projects such as housing projects to enhance their way of life	The developer will require consultation since the exploration activities will be conducted within the community
	Fire and Rescue Committee	Provide consultation and guidance on fire and rescue measures at the project site	The project will require consultation on fire-fighting equipment and rescue measures to be taken in case of fire incidents or mining accident
	Tanzania Social Action Fund - TASAF	Provides regular cash payments to participating households on a bimonthly basis	The project will require consultation with TASAF as their project can be impacted by the project activities
Ward Level	Ward Offices for Ward	Government offices responsible for Ward administration, community development and social welfare	The ward offices will be consulted with to gather socio-economic information on the project area.
Village Level	Village offices of:	Government offices and community representation responsible for Ward administration, community development and social welfare	Will be consulted in order to be informed about the project, and so as to seek their input on any concerns regarding socio-economic impacts that the project will have on them.
		Community members located in the foot print of the proposed project or in close proximity to the project area which may be directly or indirectly impacted	Will be consulted throughout the project's life to inform them about the project, identify their concerns and suggestions and to provide

Level	Stakeholders	Specified areas of interest	Remarks
Community Level	Community members from villages	upon by the project in terms of resources (Land/house etc.) health and injury and this could lead to interference with current livelihood activities, pollution etc.	them with all proposed measures aimed at addressing their concerns as the project progresses.

Source: PaulSam Geo-Engineering Co. Ltd Consulting July, 2023

### 5.3 METHODOLOGY

The techniques for identification of key issues included a mixed approach that combined desk review and qualitative data collection methodology in which Observation, Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) with stakeholders were conducted. The activity used purposive sampling approach for selecting KIIs. The KIIs involved a discussion between a team of local experts and professionals who have first-hand knowledge about the community and the consultant expert team. The latter team applied probability sampling techniques for the FGDs because every member of the community had an equal opportunity to be part of the sample in the stakeholder engagement activity. Community level engagements were also made possible through interaction and observations of community settings during the field visits which were conducted in the project villages and the area of influence.

#### 5.3.1 Stakeholder Assessment

**5.3.2 In the Environmental and Social Impact Assessment, stakeholders were categorized in two groups such as Primary and Key stakeholders. Key stakeholders on the other hand are those who have significant power or influence to determine the direction and outcome of the project. Primary stakeholders for example, are those who gain or lose significantly from the project or who make direct contribution of resources or services to the project. This section outlines a range of key and primary stakeholders consulted during the scoping and ESIA process for the proposed development. In the desk review, a detailed review of key documents including but not limited to project documents such as background information, Project design documents and feasibility study reports and literature relevant to Standard Gauge Railway (SGR) operations in Tanzania was undertaken. Source documentation was also obtained from NEMC, Regional, District, Ward and Village authorities. Public meetings and consultations**

Meetings with community members and community groups were conducted through an initial mapping of potential social and environmental issues that may arise as a result of the project, informed by international and national guidelines for conducting ESIA (Plates 5.1 and 5.2). Issues

examined included land tenure, health-impact assessment, women and gender- related impacts, children, education, envisaged benefits as well as project related risks and vulnerabilities.



**Plate 5-1: Photo of Public consultation in Simbo ward and Usinge village**

The key stakeholders were categorized into groups according to their major concerns regarding the project. The stakeholders also involved all individuals and groups that might, in one way or another, positively or negatively become affected by the project. The Stakeholders were consulted through; in-depth Interviews (IDIs), KIIs and FGDs in order to address the various issues at hand. Additional stakeholders will be identified during the remainder of the ESIA process. Identification of potential stakeholders will continue throughout project planning and implementation.

### **5.3.3 Observations**

For the purpose of data collection, the stakeholders' engagement team made visits to the project site, ward and village headquarters, surrounding villages and the District council offices of Tabora and Kigoma municipal councils, Kigoma DC, Kaliua DC, Uyui DC, Urambo DC and Uvinza DC. During these visits, community activities observations and settings vis-à-vis the project area were made to establish the potential social and economic impacts of primary and secondary importance related to the SGR project.

The key identified stakeholders and their specific areas of interests are listed in Table 5.1. This list was updated throughout the SE process to ensure that all key potential stakeholders were meaningfully consulted on a continuous and transparent basis, in order to enhance the implementation of project activities.

### **5.3.4 Interviews**

An interview is a methodology that relies on asking questions in order to collect information. Interviews involve two or more people, one of whom is the interviewer asking the questions. During the SE activity, two kinds of interviews were conducted; one was the KIIs and the other

one was the FDGs (Plate 5.3 and 5.4). These methods and their target groups have been explained in subsequent sub-sections.



Plate 5.3 Interview with TFS.



Plate 5.4 Interview with TANROAD

### 5.3.5 Key Informant interviews

The Key informant interviews are qualitative in-depth interviews with people who know what is going on in the community. The purpose of key informant interviews is to collect information from a wide range of people—including community leaders, professionals, or residents—who have first-hand knowledge about the community. These interviews also added valuable inputs regarding the anticipated project. These were one-on-one interviews and discussions conducted with the stakeholders. However, most times these interviews turned into group discussions by means of the person being interviewed inviting their staff to participate in the discussions. Consultations with key informants were conducted through pre-prepared but not rigidly applied set of open ended interview questions. This involved individuals and stakeholder groups who in one way or another will be impacted by or be involved in the project and its associated activities. The aim was to assess attitude, perceptions and experiences of the social-economic impacts of the SGR. During this activity, KIIs were conducted at the Regional level, District level and Institutional and Regulatory bodies (Plates 5.5 to 5.8). These KIIs provided useful information with their “expert” knowledge of the anticipated positive and negative impacts of the project.



**Plate 5-2: Photo of KII interview with different Stakeholders**

### 5.3.6 Focus Group Discussions (FGDs)

The FGD brings together a group of participants to answer questions on a topic of interest in a moderated setting. The FGDs are qualitative in nature and often study the group’s dynamic and body language in addition to their answers. The FGD is a qualitative research method and data collection technique in which a selected group of people discusses a given topic or issue in-depth, facilitated by a professional and external moderator. The moderator mainly used participatory approach in conducting the discussions.

The FGDs are usually made up of five to eight participants and other times ten people depending on the topic and involvement of the participants. The groups were made of people of the same interests and similar activities (cohort). The FGDs were mostly conducted in the villages (closest to the project) to discuss various issues related to the project and potential positive and negative impacts. The FGDs were conducted separately considering gender, age and activities and interests

to allow free expression since some of the topics targeted a specific group because of socially constructed norms. Each FGD was carried out separately led by a qualified sociology expert and particular questions concerning issues of employment opportunities, health and safety, risks, and advantages of the project were discussed by groups of stakeholders (Plates 5.9. These groups included both male and female adults, elderly, youths, leaders and the vulnerable groups including people living with disability.

The outcomes and records of the discussions from each group were later presented in plenary for community verification. See sample of distributions on Table 5.1.



Plate 5.7 The FGD at Kandaga village, Uvinza DC

### 5.3.7 Village Checklist

The 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, pasture, market place, cemetery area, water supply system and religion or cultural place were assessed

## 5.4 STAKEHOLDERS' VIEWPOINTS AND ISSUES

The key points identified by means of the stakeholders' engagement process during the ESIA study have been categorized and listed as key concerns. A list of all stakeholders consulted is shown in Table 5.3.

### 5.4.1 Summaries of Key Issues

Analysis of the data involved thorough reading by the Assessment Team that helped to churn out patterns aligning to the developed framework. The data was then reduced into codes which

contained relevant information for the different categories. All codes were reviewed to get a sense of most spoken areas/issues, different views based on the questions asked, issues that are of most concern to different stakeholders and similarities between issues raised.

The second step focused on examining the codes for patterns and interconnections and fitting them into a particular issue. This step was followed by the review and clear definition of issues which provided a good foundation and enough insights that enabled writing the ESIA report. Table 5.4 shows the issues that were raised arranged according to frequency of mentions by the different stakeholder groups.

**Table 5-3: Ranking of stakeholders’ issues of concern.**

No.	Summary of Issues	Frequency of mention
1.	Compensation	120
2.	Improved transport services	100
3.	Employment opportunities	80
4.	HIV/AIDS	75
5.	Destruction of forest area	60
6.	Environmental pollution	60
7.	Increase in revenue	60
8.	Growth of business and investment sites	55
9.	Loss of land for farming and pasture	50
10.	Social services	40
11.	Population influx	40
12.	Improved influx	40
13.	Cultural disruption	35
14.	Security and safety measures	30
15.	Increase income and revenue	30
16.	Dust	25
17.	Noise pollution	20
18.	Loss of vegetation	20
19.	Deforestation	



20.	Diseases	15
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Source: PaulSam Geo-Engineering, July, 2023

## 5.5 PRIMARY ISSUES OF CONCERNS

### 5.5.1 Environmental Issues

The following is a short description of environmental issues of concern noted:

- i. Loss of vegetation from the forest reserves and also commercial crops such as Tobacco and Cotton from both regions. Kigoma region is known for palm trees cultivation which is a main source of income from the region. One palm tree can generate up to 140,000/= a year. When the SGR project confiscates their farms, they will get into loss. Some community members expressed that they have secured loans from cooperative unions (AMCOS) and their palm tree farms are their main source of income to return the loans;
- ii. Loss of land that can come as an outcome of leaving behind massive holes after digging soil and sand that will be used in the construction activities. All the villages visited practise agricultural activities on a seasonal basis and some villages such as Kalenge village in Uvinza district insisted that their land is too congested therefore they will lose land which is already limited in space for settlement and farming activities;
- iii. Loss of land for grazing of livestock. The stakeholders mentioned that the exploration activities can cause loss of land which is used largely by the community for grazing livestock. All the agricultural officers mentioned presence of grazing land in the proposed villages that the SGR will cross;
- iv. Rehabilitation plan. The stakeholders also posed a question on the rehabilitation plan after completing the construction activities. They raised concerns of massive holes been left behind after completing the construction activities;
- v. Land pollution was among the issues raised were there would be cases of land degradation as an outcome of the heavy trucks that will be used to carry equipment and soil erosion that can come by cutting down trees;
- vi. Noise pollution was also mentioned whereby the community and the livestock will be affected by noise from the construction activities; and
- vii. Air pollution was reported due to smoke that may arise from the machines that will be used during construction activities that can cause diseases such as coughing and flue. Possible effects of dust that can be generated from construction activities.

### 5.5.2 Economic issues

The economic issues of concern noted include:

- i. Disruption of economic activities. The community members also raised issues concerning the daily economic activities such as selling honey and wax, palm oil and milk;
- ii. Raise the living standard of the people of the villages surrounding the project area by providing some percentage of the profit to the village government that will be used for developmental activities around the villages;
- iii. Foster favourable environment for self-employment and increase opportunities all groups in the community from the skilled labour, unskilled labour, women and people living with disability within the project framework;
- iv. Consider and promote employment opportunities for youths and priority should be given to the natives/local community;
- v. Fully implement sustainable community development initiatives, infrastructure and social services including improved education, improved health services, improved electricity and water supply, improved roads and access to communications; and
- vi. Developing the Infrastructure specifically roads in the villages which are not conducive now and more during rainy season. The proponent is expected to improve the road condition since they will also use the roads for transportation of their goods during construction activities.
- vii. Most of the stakeholders expressed that the SGR project will raise the economy of the two regions because of easy transport services. Visiting cities like Dar es Salaam and Dodoma will be easy to reach and they will use the railway to transport crops.

#### 5.5.2.1 Social issues

The social issues of concern found include:

- i. Improvement of social services in the project area, particularly health facilities, schools, electricity and water supply and opportunities for women/youth economic groups, etc.;
- ii. Influx of population which will create opportunities for income generating activities such as restaurants, lodging and shops to the residents of Tabora and Kigoma. This will also increase tourism in the area since they have tourism spots such as Mahale Mountain, Lake Tanganyika and cultural tourism;
- iii. Population influx increasing rates of contagious diseases such as cholera was voiced as a concern; and

- iv. New people vacating into the area could bring conflicting cultural views to the project site villages causing discomfort to local residents and their cultural traditions.

### **5.5.3 Key Issues to be addressed in the ESIA**

Key issues, concerns and recommendations communicated by stakeholders regarding potential impacts associated with the proposed Project have been organized into the categories as listed in subsequent sub-sections.

#### **5.5.3.1 *Concerns about PAPs compensation process***

The key concerns raised by most of consulted stakeholders at the regional, district, village and community levels were on compensation related issues. The questions were mainly around, who will be compensated, who will pay them, how much will they be paid and the type of compensation whether it is in form of monetary or the asset that is being confiscated. Most of the stakeholders engaged at the village level insisted on the compensation to be equal to the value of the asset that is being compensated and that it should be done swiftly and timely. Some insisted that the proponent should compensate the trees, soil/sand in case they will need to confiscate a farm.

Other questions included: who will determine the rates as well as time frame for vacating their premises to give way to project implementation and some insisted that the compensation should be done before the construction activities commence since most projects have a tendency of taking a long time to pay the compensation. It is apparent that the low level of awareness on compensation process in all the villages that we visited might be a major source of conflicts during initial stages of project implementation. It was reported that recently from the ongoing road construction activities of the main road from Nguruka to Uvinza, the compensation was not done according to their expectations and they still feel that the process caused more harm to them. They were asking the same thing not to repeat in the SGR construction activities.

#### **5.5.3.2 *To build flyovers for animal and people crossing***

All the villages visited expressed the need of having flyovers that will simplify the passage of people and livestock to cross to the other side while looking for pasture and some have settlements in either sides of the right-of-way of the SGR line.

#### **5.5.3.3 *Rehabilitation plan***

The proponent should set a rehabilitation plan after the partial decommission phase where most of the stakeholders mentioned that the proponent should cover the massive holes that they will leave behind after construction activities and also to practise afforestation measures.

#### **5.5.3.4 *Employment opportunities***

All the stakeholders engaged were happy with the project because it will create job opportunities to the community members both youth, women and the elderly. In some of the villages insisted

that the employment process should be transparent and everyone should have an equal chance of been selected.

#### 5.5.3.5 *Cooperate Social Responsibility*

Most of the engaged stakeholders mentioned corporate social responsibility (CSR) as one of the requirement that the proponent needs to abide on.

#### 5.5.3.6 *Number of Railway stations*

Most of the engaged stakeholders expressed that the proponent should consider increasing the number of railway stations. They expressed that these stations will increase business opportunities were the community members would sell various products such as food, fruits, honey and oil. This will also increase the government's revenue since investors will be more attracted to invest in these areas in lodging, housing and factories.

#### 5.5.3.7 *Cultural disruption*

Most of the stakeholders from the District, organizations and villages expressed that, the project will cause integration of various people from different cultural backgrounds. These people will come with modern ways which will change the local behaviour in these communities. Also this cultural integration can cause intermarriages and can also lead to the increase in the number of street children when the project phases out. Also, cultural disruption can bring about hooliganism and theft of people's assets reducing the security.

#### 5.5.3.8 *Disruption of economic activities*

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.

## 5.6 ISSUES ANALYSIS AND PRELIMINARY RECOMMENDATIONS

Most of the village residents consulted were aware of the project concerning the construction of the SGR operations from Tabora to Kigoma. Most of the key informants that were involved were feeling proud of having the project activities in their area in terms of boosting the national and local economy, community support, and improving local services and infrastructure.

### 5.6.1 *Waste Management and Pollution Control*

Domestic and process waste streams should be identified, separated, quantified and appropriately managed, including reduction and reuse/recycling of waste streams where possible or practicable. Waste disposal should be done efficiently and in an environmentally and socially friendly manner.

### **5.6.2 Corporate Communication and Assurance of Impacts Mitigation and Management**

In meetings held at District and Village levels, local residents expressed fear of some foreign and unknown investors becoming unreliable or unfaithful to keep commitments made during project planning with regard to environmental protection, management and rehabilitation of the project site and surrounding area. Robust and on-going communication of commitments to impact management and mitigation measures as well as the mechanisms for quality assurance and monitoring, will be needed to address stakeholder concerns.

### **5.6.3 Construction of Project-associated Infrastructure**

During the construction phase, there will be an increase in vehicular traffic, including heavy trucks and construction equipment. Associated impacts include dust, noise, vibration, heavy road traffic and associated health and safety impacts, waste generation, fugitive emissions from vehicles, high number of temporary and long terms employees and their associated accommodation and sanitation facilities.

### **5.6.4 Contagious diseases and General Health Issues**

A significant concern of stakeholders is the increase of diseases to the residents at the project sites. This is associated with population influx in response to increased project activities and employment opportunities. Residents are concerned about increased rates and risks of diseases such as HIV/AIDS from increased interaction with non-local residents, particularly temporary workers. Numerous government and NGO-sponsored community programs exist in Tanzania for disease awareness and education, including providing information and encouraging Voluntary Testing and Counselling (VTC). These should be promoted and facilitated in the project villages.

### **5.6.5 Employment opportunities**

The creation of employment opportunities may attract a large number of job seekers to the villages. Typically, the numbers of such job seekers are higher than what the Developer can employ and as a result, local rates of unemployment spike, which in turn increases pressure on weak existing social services, infrastructure and resources, for example, health, education, water, power, etc. Rapid population influx, particularly coupled with higher rates of unemployment, may result in increased socio-cultural conflict, natural resource conflict, and increased crime rates.

The Village Security Committee will be established to manage incidences of crime, and crimes are handled effectively in accordance with the ward security plan. The Developer will work hand in hand with the village government to enable security groups (specifically the *Sungusungu* and *mgambo* traditional volunteer associations) to cooperate with police to maintain peace and harmony in the community. The community expects that the project will build and improve the existing security endeavours.

### **5.6.6 General Community Well-being**

The proposed Project is anticipated by stakeholders to generate several positive impacts:

- i. Improved income-generating opportunities;
- ii. Both direct and indirect employment opportunities for local people;
- iii. Boost in the local economy due to increased income that will be contributed by the proponent which will allow access to goods, infrastructure, and services; and
- iv. Some continued support from the proponent for improvement of community social services in the area, particularly with respect to education, health care, transport, and economic opportunities, etc.

### **5.6.7 Infrastructure**

Stakeholders anticipate improvements in their access to transportation and markets associated with better road and communication infrastructure once the project activities are in place.

### **5.6.8 Employment**

Almost all of the stakeholders interviewed at National, Regional, District and village levels saw the SGR project as being positive in terms of providing employment opportunities, capacity building and skills transfer to the local population, specifically, and to the nation of Tanzania. Women and people with disabilities saw the project as an opportunity for them to engage into self and project employments.

Stakeholders also noted that an improved economic climate in the project villages may improve living standards and conditions, which may by extension, attract skilled professionals and desirable business, drawing more people in search of better living conditions.

However, some local residents expressed fear of the proponent providing employment to non-locals over the local workforce, particularly unskilled youth who may leave the project area in searching of alternative employment or engage in unproductive activities due to low levels of employment opportunities. Local residents requested preferential consideration for employment, especially for unskilled positions and professional training for better skills that will eventually enable them to compete for more skilled and better paying jobs.

### **5.6.9 Other Stakeholder Expectations**

It is the expectation of the local population that the Developer will comply with the investment policy that requires investors to contribute towards community development in sectors such as education, health and infrastructure. Specifically:

- i. Residents hope for support towards the process of improving their schools in terms of building or renovating classrooms and housing for the teachers;
- ii. Vulnerable groups expect to be provided with support such as training and study material assistance in schools;
- iii. The local community expects to get education on the prevention mechanisms of diseases such as HIV/AIDS; and
- iv. It is anticipated that the company will have a Department that will deal with the community issues when the local community members come to ask for support for their families or for any grievances.

### **5.7 MATRIX WITH ISSUES OF CONCERN**

During the stakeholders' engagement activity, the team wrote a summary of all the issues that have been raised by the stakeholders from the Regional to the community level. This matrix gives a clear picture of issues raised by every stakeholder consulted and it also includes responses that were presented by the developer at every level during the stakeholder engagement activity.

**Table 5-4: Issues and concerns raised by stakeholders from Tabora Municipal, Uyui DC, Urambo DC, Kaliua DC, Uvinza DC, Kigoma Municipal and Kigoma DC**

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
<b>KIGOMA MUNICIPAL COUNCIL</b>				
Titus James	Kigoma Regional Office	Regional Land and Planning officer RTPO	<ul style="list-style-type: none"> <li>i. The proposed project is positively accepted and the office has engaged in project campsites construction;</li> <li>ii. They are requesting the project plans;</li> <li>iii. The proponent should ensure proper land compensation to the affected parties; and</li> <li>iv. Adhere to all relevant laws, rules and Regulations during project construction.</li> </ul>	The proponent will comply with the issues raised
Swantum Mgonja	Kigoma Urban (Municipal) Level	Municipal Director	<ul style="list-style-type: none"> <li>i. Provide Employment priority to the natives of the project site;</li> <li>ii. The project will simplify the transportation for example goods and local people; and</li> <li>iii. Ensure no delay of compensation to affected parties.</li> </ul>	The proponent will comply with the raised issues
Shery Petro	Tanzania Forest Services Agency	Regional Manager	<ul style="list-style-type: none"> <li>i. The office oversees the Kasuku Forest Reserves located in Uvinza District;</li> <li>ii. Proponent should follow the rules and regulations when implementing her project;</li> <li>iii. All wastes generated at the site should not disposed into reserved forests;</li> <li>iv. The proponent should ensure no degradation of reserved forests located in Msimba, Nyamoli and Kasuku Village; and</li> <li>v. All invasive plant species should be removed at the end of project construction phase.</li> </ul>	The proponent will comply with the issues raised
Imanne Mbuguda Maphael	Tanzania Social Action Fund – TASAF District Office	TASAF Executive Regional/District Director	<ul style="list-style-type: none"> <li>i. Proponent should have good relationship with local Authority and communities; and</li> <li>ii. Involve local communities in light tasks by paying them low wages.</li> </ul>	The proponent will comply with the issues raised
Eng. Mwitwa Mramu	Tanzania National Roads Agency - TANROAD	Regional/District Manager	<ul style="list-style-type: none"> <li>i. Ensure road safety to pedestrians in all roads that will cross the railway;</li> <li>ii. Use automatic gate control in all road cross;</li> <li>iii. Other environmental impacts should be put into consideration during project construction; and</li> <li>iv. Proponent must notify the TANROAD during project implementation</li> </ul>	The proponent will comply with the issues raised
			<ul style="list-style-type: none"> <li>i. The office has already notified TRC about two</li> </ul>	



Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
Eng. Jumanne Kamungile	Tanzania Rural and Urban Roads agency – TARURA Regional/District Office	Kigoma Regional/District Manager	<ul style="list-style-type: none"> <li>ii. Proponent must notify TARURA office before implementation of her project.</li> </ul>	The proponent will comply with the issues raised
Eng. Hamid Kionywaki	Tanzania Electric Supply Company-TANESCO Regional/District Office	Ag. Regional/District Manager	<ul style="list-style-type: none"> <li>i. Proponent must put into consideration the minor lines must that intervene the proposed project;</li> <li>ii. Notify the Authority before shifting the poles;</li> <li>iii. Ensure the use of electricity instead of utilizing the fire woods, so as to reduce the burden on the environment degradation;</li> <li>iv. The project will increase revenue collection to TANESCO;</li> <li>v. Workers must wear the protective gears during project construction;</li> <li>vi. The proponent should provide appropriate gears at right time project construction; and</li> <li>vii. The proponent should provide appropriate gears at right time.</li> </ul>	The proponent will comply with the issues raised
Jacob Chacha	Fire and Rescue Force Regional/District Office	Regional/District Fire Officers	<ul style="list-style-type: none"> <li>i. Ensure installation of fire supreme equipment to strategic places;</li> <li>ii. Labeling the signs and placing alarms in the strategic site;</li> <li>iii. Ensuring the Proponent managing and maintaining fire safety and rescue facilities;</li> <li>iv. Acquire Fire Certificate</li> <li>v. Fire alarm must be installed in case of emergence and firefighting equipment must be placed in a wall and other areas during operation;</li> <li>vi. Training of firefighting for workers must be provided; and</li> <li>vii. Firefighting equipment should be serviced accordingly.</li> </ul>	The proponent will comply with the issues raised
Kulwa James	Lake Tanganyika Water Basin Board Office	Ag. Regional/District Manager	<ul style="list-style-type: none"> <li>i. They oversee the Ruiche, Malagarasi and Katosho water basins;</li> <li>ii. Avoid blockage of water flow in all water basins;</li> <li>iii. Avoid improper management of waste water to be generated during project implementation;</li> <li>iv. Waste water should not be directed into the rivers or streams;</li> <li>v. The proponent should notify the Board in case need to use water from the basins;</li> <li>vi. Proponent must form survey team that involve personnel from the Lake. Tanganyika Water Basin</li> </ul>	The proponent will comply with the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			Board; and vii. The commencement of plant should be 60 meters apart from the rivers.	
Edward Labula	Tanzania Port Authority (TPA)	Kigoma Port Manager	i. The office oversees the Katosho dry port and other projects which are implemented along Malagarasi River; and ii. The proposed project is expecting to open the new economic opportunities.	The proponent will comply with the issues raised
Abra Barushi	Rural Water Supply and Sanitation Agency- RUWASA	Regional Manager	i. Ensure proper protection of water bodies around the proposed facility; ii. Notify the RUWASA in case she wants to source water from the rivers; iii. Proponent should ensure proper waste management; and iv. Adhere to all relevant laws, rules and Regulations during project construction.	The proponent will comply with the issues raised
MDC	Mtaa office	Bushabani Mtaa Chairperson	i. The vibrations from the train can cause cracks in the houses around the area; ii. The proponent should be aware of the water sources such Nyakageni and Msulula sources. The water from these sources is very rare. The proponent should not destroy or cause pollution in the water sources; iii. There trees that are along the water sources so the proponent should not cut them because they are important in preserving water from these sources; iv. There palm trees that the proponent has to know and these trees help in educating the children; v. The proponent should prioritize the natives when it comes to employment opportunities. They have Youths who have studied up to university level and many youth who can do casual labour; vi. They should increase the distance of the railway from people's settlement. It should be more that 60km; vii. The proponent should have education seminars for their staffs not to impregnate our girls; viii. The proponent should pay everything that is in the area if it is a plant, soil or trees and not just generalizing all the items;	The proponent will comply with the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>ix. The compensation should be the same to the value of the house or farm;</li> <li>x. They should not play favoritism or discrimination in any form when people come to ask for job opportunities. The proponent should form committees that will be used to look for the natives when there are job opportunities;</li> <li>xi. They would like to have a train station in Bushabani street;</li> <li>xii. The proponent should put bridges in Kibirizi to allow crossing of livestock, children and adults;</li> <li>xiii. It will be easy transport from one place to the next; and</li> <li>xiv. When the train starts to operate then it will be easy to transport goods.</li> </ul>	
Kibirizi ward (PROVIDE A NAME)	Kibirizi Mtaa  Butunga Mtaa	Kibirizi Mtaa Chairperson  Mtaa Chairperson	<ul style="list-style-type: none"> <li>. The project will be required to take into account environmental protection, including covering the holes resulting from the construction activities;</li> <li>i. The project should focus on not damaging various water sources such as valleys and lake streams. Some of the natural water sources are used by residents in their livelihood activities;</li> <li>ii. Some of the areas where the SGR project will pass have a large brick-making project where different young men and women are employed. The bricks are sold in various areas of Kigoma region. Therefore, leaders have suggested the need to think of a way to help these young people to find alternative sources of livelihood;</li> <li>v. During valuation procedures the project will have to take into consideration the Assessment standards that when the project starts should take into account the state of modernity and urban growth currently existing in the areas affected by the project;</li> <li>v. Urban development including the construction of modern houses for residents whose homes will be affected by the project;</li> <li>vi. The project will stimulate and speed up the social and economic development within the neighborhood, the district, and the nation as a whole;</li> <li>vii. The project is going to address the transport and transportation challenges in terms of passengers and</li> </ul>	The proponent will comply with the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<p>cargo. Will connect easily Kigoma region with other business cities like Dar es Salaam;</p> <p>viii. The project will be required to place crossings in dangerous areas for pedestrians and normal car roads to prevent accidents;</p> <p>x. The process of valuation to compensation payment should not take long. When take more time than that required by the law impoverished people instead of maintaining their lives;</p> <p>xi. Openness and transparency in all stages of the project implementation including in the amount of compensation may improve the relationships between the project proponents, the PAP, and Mtaa leaders;</p> <p>xii. The process of land acquisition and valuation if it takes a long time may lead people to dislike the project. The leaders explained that the residents of Butunga Street have the scars of the dry port project implemented by TPA in Butunga the case is still in the country's high court;</p> <p>xiii. They are worried that the project will stimulate the erosion of morals including the increased number of commercial sex workers. There is a need for health programs to make health follow-ups to control sexually transmitted diseases such as HIV; and</p> <p>xiv. They have recommended that the provision of employment to various groups of people is better if will consider the development of the residents of the villages and streets that are directly affected by the project.</p>	
Kigoma Mjini (Name of the Officer)	Lumumba Mtaa office	Mtaa Chairperson	<p>Initial stages of project implementation especially the construction phases are more likely to impact the change in land use and stimulate the urbanization processes. There will be a need for a strategy to manage such a process to minimize the increase of squatters in urban settings;</p> <p>During the construction activities there will be an increase in population seeking opportunities. There is a need to know the strategy that will be used to manage people's and project staff interactions to avoid and minimize health impacts including the sexually transmitted diseases;</p>	<p>i. Valuation exercise and payment rates for things that should be paid is a legal process through the government's chief appraiser. Therefore, compensation levels are not given based on the wishes of the project-affected persons</p>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>i. Compensation should be fair and reasonable, the fact that it is a developmental project but it should not impoverish the project-affected persons;</li> <li>ii. Employment opportunities especially unskilled labor should go to youth living in the project areas;</li> <li>iii. During the construction phase women living within the project area should be given the opportunity to self-employment through food vendor activities instead of bringing large companies to provide such services;</li> <li>iv. The implementation of this project is believed to help reduce transport and transportation challenges and increase social and economic interaction between Kigoma and other regions within the country;</li> <li>v. Growth of towns and change in the outlook and appearance of the streets and Kigoma district in the city in general;</li> <li>vi. Reach markets outside the region, especially transporting fresh fish to the distant market easily such as Dar es Salaam;</li> <li>vii. It is going to open opportunities for distant markets, especially to be able to transport fresh fish from Kigoma to the markets found at Dar es Salaam; and</li> </ul>	<ul style="list-style-type: none"> <li>ii. The provision of employment will also focus on the villages and streets affected by the proposed project</li> </ul>
<b>KIGOMA DISTRICT COUNCIL</b>				
Ms Dorath Muzila	Kigoma Municipal and Rural Council Office	District Commissioner	<ul style="list-style-type: none"> <li>i. The project has good impact to the community and the country at large;</li> <li>ii. Ensure proper compensation of affected land and other properties; and</li> <li>iii. Proponent should restore all established borrow pits after the construction of the project.</li> </ul>	The proponent will comply with the issues raised
Mrs Manumba	Kigoma Rural Council Office	District Executive Director (DED)	<ul style="list-style-type: none"> <li>i. The office Ensure corporate social responsibility;</li> <li>ii. Ensure proper and early compensation to the affected parties; and</li> <li>iii. The local communities are expecting job opportunities from the project.</li> </ul>	The proponent will comply with the issues raised
			<ul style="list-style-type: none"> <li>i. The Proponent should protect the environment during the implementation of her project;</li> <li>ii. All water bodies should be protected during all phases of project; and</li> </ul>	

<b>Name</b>	<b>Institution</b>	<b>Designation</b>	<b>Comments/Issues</b>	<b>Response For Raised Issues/Concern</b>
etronia wakik	Municipal/ Rural Council Management Departments	DEMO	iii. The Council is planning to establish the industry that will recycle all waste materials into manure.	The proponent will comply with the issues raised
ulokozi aimukirwa	Municipal Natural Resources Office	District Natural Resources Officer	i. The proponent should put attention in reserved forest located in Msimba, Nyamoli and Kasuku Village; ii. Dust must be well managed to avoid air pollution especially nearby bee keeping schemes; iii. Establish the nursery trees that will be used to restore area where has extremely affected with the project; iv. Proponent should leave or put attention to all endemic, famous or traditional trees; and v. All invasive plant species should be removed	The proponent will comply with issues raised
ame	Municipal Forestry Department	Municipal Forestry Officer		
atma James	Municipal Fisheries Office	Municipal Fisheries and Livestock Officer	i. The endemic plant species should be notifying to the authorities for further consideration; and ii. Workers should put consideration the special habitats.	The proponent will comply with the raised issues
Alfred Msangi	Municipal Wildlife Office	District Wildlife Officer	i. The proponent may use Msimbo area for burrow pits purposes so as to avoid invasion of species; ii. Proponent should try to her level best to avoid habitat degradation; iii. The endemic or endangered animal species should be relocated into the protected areas; iv. All intrude species and invasive species should be removed at the end of the project construction; and v. Proponent should provide and enforce the use of personal protective gears during the construction phase.	The proponent will comply with the raised issues
atma James	Municipal Livestock Office	Municipal Livestock Officer	i. The endemic plant species should be notifying to the authorities for further consideration; and ii. Workers should put consideration the special habitats.	The proponent will comply with the raised issues
			The proponent should put consideration in the existing scheme of palm trees in Simbo, Kasuku and Machazo Villages;	

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
Jackson Mahabi	Municipal Agricultural Office	Municipal Agricultural Officer	<ul style="list-style-type: none"> <li>i. All intrude species and invasive species should be removed at the end of the project construction; and</li> <li>ii. Adhere to all relevant Laws, Regulations related to the proposed project.</li> </ul>	The proponent will comply with the raised issues
VDC (Name of the Chair or Secretary/Mtendaji)	Msimba Village Office	Msimba village Chair/Mtendaji	<ul style="list-style-type: none"> <li>i. The project has significant to our country as it promotes the economy because it accelerates the spur business and employment opportunities to youths;</li> <li>ii. The proponent should put special consideration of Land and other properties Compensation issue and its payment time frame before project commencement;</li> <li>iii. Proponent should give priority the nearby communities more job opportunity;</li> <li>iv. The proponent should ensure Social Corporate responsibility; and</li> <li>v. Unplanned pregnancies and marriage dissolution from the immigration of people.</li> </ul>	The proponent will comply with the raised issues
VDC (Name of the Officer)	Kikungu Village office	Kikungu village Chair	<ul style="list-style-type: none"> <li>i. The project has significant to the Village as they promote the economy;</li> <li>ii. Benefits to communities resulting from great employment opportunities;</li> <li>iii. Increase revenue collection due to spur business;</li> <li>iv. Consider reduction of dust emission; and</li> <li>v. The local people are expecting to improve their living standard from the opportunities that will be associated with the project.</li> </ul>	The proponent will comply with the raised issues
VDC (Name of responsible officer)	Simbo Village office	Simbo village chairperson	<ul style="list-style-type: none"> <li>i. We want the project people not to touch the graves but if they have to then they should make sure they do not scatter the human remains because they will be cursed;</li> <li>ii. The railway has crossed in a valley that has Palm trees therefore if the proponent wants to use that area, they should get into partnership with the farmers and pay on monthly basis;</li> <li>iii. The main focus should be paying compensation for the Palm tree rather than the graves;</li> <li>iv. We like the project but the compensation for the farms that will be acquired by the project should be in terms</li> </ul>	The proponent will comply with the raised issues

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<p>of cash and should be paid annually;</p> <p>v. The people who come from different places should respect the culture of the respective village in terms of clothes, language and behavior;</p> <p>vi. The proponent should make sure they conduct a rehabilitation plan after decommission which will include soil erosion measures and capping;</p> <p>vii. The railway will be of an advantage to them because the market value of our products will rise; and</p> <p>viii. The Youth will get employment opportunities in both technical expertise and casual labourers. They have youths who completed standard 7, Form 4 and a few who completed university.</p>	
Name of VDC Chair	Machazo Village Office	Machazo village Chairperson	<p>i. The farmers in these areas have acquired loans from their AMCOS so when the project starts and their land is acquired, they will have a problem with the lenders because their land will be reduced or acquired;</p> <p>ii. Through SGR project, they will be able to get transport for our goods and for ourselves;</p> <p>iii. The Youth will also get employment;</p> <p>iv. Growth of business due to integration of various people;</p> <p>v. They villages will have opportunities to bring in machines for crushing pebbles and get profit;</p> <p>vi. The compensation should be in form of providing land instead of money;</p> <p>vii. When the project has to acquire land then the compensation should be more or less the same with the land value;</p> <p>viii. The project should make sure they do not destroy the graves and grave yard;</p> <p>ix. The proponent should construct a bridge that will be used by livestock and people to cross from Machazo to Luiche; and</p> <p>x. We agree for the proponent to move the grave and the human remains but it should be done carefully not to scatter the remains and also the people should be paid</p>	The proponent will comply with the raised issues



Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			compensation.	
NAME of the Village Chairperson	Nyamoli VDC Office	Nyamoli VDC Chairperson	<ul style="list-style-type: none"> <li>i. If the project will involve people’s displacements it is better that people will need to know how and in what ways they will have to leave their property;</li> <li>ii. Since the implementation of the project might involve the demolition of structures along the railway corridor it is better that there is a need to know how they will be compensated;</li> <li>iii. There is a probability the implementation of the SGR project will relocate some of the livelihood activities of the people such as their farms to pave the way for project implementation. We need to understand how such people will be supported in terms of replacement farms and food security for their households;</li> <li>iv. Our village and district in general have some unique plants such as palm trees that in other regions are not found that much and it is one of the major sources of income. We want to understand if there would be an alternative plan if one lost the land with palm trees;</li> <li>v. They do not have paved or gravel roads in their village, so, they want to understand if there will be dust control mechanisms during construction activities should be put in place as more project vehicles and tracks will use the same road infrastructure used by residents to transport various equipment in the project sites. Development of towns and cities;</li> <li>vi. Due to this project, there is a possibility of population increases in our village seeking opportunities for unskilled labor. We need to know how people’s health is going to be managed in order to control the sexually transmitted diseases;</li> <li>vii. Our main livelihood activity is agriculture and the implementation of this project expects to acquire land that is used for agriculture. There is a need to put forward an alternative for agricultural land to avoid food insecurity in the future;</li> <li>viii. Compensation laws and procedures must be open to people and all who will be affected by the project will have to be compensated;</li> <li>ix. Employment Opportunities to none skilled labor should first go to youth living in the project villages;</li> </ul>	<ul style="list-style-type: none"> <li>i. The implementation of projects of this kind is governed by a legal process. So those who will be found to be affected by the project will be given all the procedures in other steps of project implementation that will follow;</li> <li>ii. The purpose of the project to conduct an ESIA assessment is to find information that will help reduce and eliminate negative impacts on people's livelihoods including that of your concern;</li> <li>iii. There will be a valuation exercise that will involve all the things that are legally recognized by the government's chief valuer that deserve to be paid. So the payment for those things, including palm trees, will be included in the compensation package;</li> <li>iv. The information on each step will be provided to the respective village leaders. All hazards will be considered; and</li> <li>v. The provision of employment will also focus on the villages and streets affected by the proposed project.</li> </ul>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<p>x. Consultant staff and engineers will need to adhere to ethics e.g. avoid impregnating girls around the site especially the Chinese tend to impregnate girls around project areas and abandon them without help; and</p> <p>xi. Their village is facing challenges in some of the social services, they need support in the electricity service and a secondary school.</p>	
NAME of Kasuku Village Officer	Kasuku village Office	Kasuku VDC Officer	<p>Strategies to control dust during construction activities are needed as large vehicles and tracks will be passing through residential areas to the sites;</p> <p>Since the construction of the project will also involve the cutting of trees in the railway corridor, it is good if the project will consider having a tree planting program to continue fighting climate change;</p> <p>i. The project will need to consider the protection of natural vegetation and the ecosystem;</p> <p>ii. They expect that the project will bring about employment opportunities to the local's communities;</p> <p>iii. Guaranteed transport and transportation for passengers and cargo as they assumed that with fast trains Kigoma to Dar es Salaam will take about 12 to 13 hours only in a day;</p> <p>iv. They believe that people who will be displaced by the project will be paid fair and reasonable compensation;</p> <p>v. ii. They wanted to know if there is a procedure that will be used for the graves that will be found within the project corridor;</p> <p>vi. iii. Will stimulate social and economic development, business, and income growth starting from individuals to the regional level;</p> <p>vii. c. The system that will be used to pay compensation to the project-affected people should be known earlier. They have also suggested that project-affected people should know how they are going to handle their concern;</p> <p>viii. The government through contractors should find a way that will help minimize accidents for people being hit</p>	<p>i. The information on each step will be provided to the respective village leaders. All hazards will be considered.</p> <p>ii. The team that conducts the ESIA exercise has experts who specialize in the area. So they are monitoring all those things in different project areas to ensure the protection of nature and natural resources are maintained</p> <p>iii. If there are graves in the SGR corridor, they will be recognized and the family will get paid compensation for such graves. Transfer procedures will be given to the families of those graves when that stage is reached</p>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<p>by the high-speed train in the villages it will pass through;</p> <ul style="list-style-type: none"> <li>i. The implementation of the valuation exercise should avoid fraud to prevent conflicts. They expressed concern that they have seen other places where a resident who owns a normal house is given a lot of money;</li> <li>ii. Support the improvement in social services such as schools, dispensary, and market infrastructure; and</li> <li>iii. Adequate education should be provided to villagers about how the project will acquire land for the implementation of the SGR project. If citizens understand it, it will help to reduce or eliminate unnecessary conflicts.</li> </ul>	
NAME of Kamara Village Officer	Kamara village Office	Kamara VDC Chairperson	<ul style="list-style-type: none"> <li>i. There are plants and natural resources that are more likely to be affected by the project and there is a need for an alternative strategy to preserve. They have highlighted as follows: <ul style="list-style-type: none"> <li>a. Palm trees;</li> <li>b. Coconut trees; and</li> <li>c. Natural springs available in the village including that of Kivuluga, Bonde la Maganga as well as Katali, and Nyamunu which located along the project corridor</li> </ul> </li> <li>ii. Protecting the biodiversity along the SGR corridor in all stages of project implementation is required;</li> <li>iii. Dust control mechanisms during construction activities should be put in place as more project vehicles and tracks will use the same road infrastructure used by residents to transport various equipment in the project sites;</li> <li>iv. There is a need to ensure there will be minimal destruction in the ecosystem;</li> <li>v. All the sand pits (holes) that will be dug during the construction should be covered by the engineers after completing their construction. They see that if left alone, it will cause the problem of land degradation and flooding in their village;</li> <li>vi. Will stimulate the development of towns and small cities along the project villages;</li> </ul>	<ul style="list-style-type: none"> <li>i. The team that conducts the ESIA exercise has experts who specialize in the area. So they are monitoring all those things in different project areas to ensure the protection of nature and natural resources are maintained;</li> <li>ii. The information on each step will be provided to the respective village leaders. All hazards will be considered; and</li> <li>iii. The provision of employment will also focus on the villages and streets affected by the proposed project.</li> </ul>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>vii. Will stimulate the population influx within the village as more people will come for employment opportunities brought by the projects;</li> <li>viii. There is a need to ensure that all jobs that are none professionals should go first to the youth and other groups living in the project village;</li> <li>ix. There will be a loss in agricultural land. Therefore, people should be ensured how they will be replaced their farms;</li> <li>x. The rates of transport and transportation costs for passengers and cargo should be friendly. Many low-income earners people are using very high fares to reach some regions such as Dar es Salaam by using the current means of transport;</li> <li>xi. The present healthcare system and facility are not capable of managing large populations. Our suggestion is the project should ensure OSHA services are available near project villages throughout the construction activities;</li> <li>xii. Awareness and a good flow of information are required, especially village leaders who need to understand the project requirements. We are the ones going to face many questions from people. Most experts will be coming periodically;</li> <li>xiii. People's participation in all stages and processes of the project implementation is required to avoid misunderstanding and misinformation about the project; and</li> <li>xiv. Information flow should be tall with the geographical location of project-affected villages. When you need to talk to the village government people give us reasonable time to make preparations.</li> </ul>	
<b>UYUI DISTRICT</b>				
NAME of RC	Regional Environmental office	REME	<ul style="list-style-type: none"> <li>i. The Regional Environmental management officer on behalf of the regional commissioner outlined a number of socio-economic and environmental issues to be of concerned as far as SGR project is concerned;</li> <li>ii. There are places of conservation within the project site that have to be considered so as to preserve them on various villages on the railway line;</li> <li>iii. Several water sources are also allocated along the line thus the responsible authorities have to be consulted on how to manage them and not letting the project activities destroy them;</li> </ul>	The proponent will comply with the raised issues

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>iv. The project might also disturb the animal corridor thus alternative ways should be advised so as to prohibit the destruction of the ecosystem;</li> <li>v. The various ridges built to support the railway line might cause floods in the long run thus precautions measures should be taken into account;</li> <li>vi. There will also be a loss of vegetation on the area hence a number of rehabilitation measure should be programed to ensure the any form of environmental degradation;</li> <li>vii. Presence of various socio-economic advantages will be spelled out to benefit the surrounding communities that the project will be constructed nearby;</li> <li>viii. Employment opportunities will be available for different working groups in the community and the local content should be ensured;</li> <li>ix. Availability of business and entrepreneurship opportunities will be available to boost people's income and economic growth;</li> <li>x. Other social interaction outcome like spread of diseases will be present in the project areas due to the population increase;</li> <li>xi. Family breakages and street children might increase within the communities; and</li> <li>xii. Increase in accidents due to availability of construction vehicles like trucks and other movable machinery.</li> </ul>	
Habani R. Madi	District Commissioner's office	Ag. District Commissioner	<p>The District Commissioner insisted on TRC to have clear review of all the streets and villages the project is passing so as to ensure all the places are consulted and hence preventing the occurrence of conflicts between TRC and the villagers;</p> <p>All the environmental mitigating measures should be well addressed and monitored so as to preserve the environment of the communities that the project will have an effect on the environment;</p> <p>Other socio-economic opportunities like employment, business and entrepreneurship should be well utilized by the citizens that will be available on the edge of the rail line; and</p> <p>All sorts of pollution from the project sites should be well managed especially dust</p>	The proponent will comply with the raised issues
		District Council Management Team: DED and	<ul style="list-style-type: none"> <li>i. DED was pleased with the preliminary stages of the SGR project due to the fact that it will connect many of the Tanzanians and facilitate them to do business from one place to the other and connecting them with neighboring countries;</li> <li>ii. The DCDO advised on the need to involve all the stakeholders of the project for further review in terms</li> </ul>	

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Ms. Leekadia humesa-	Distric Council	Representatives of the Office Departments of Lands, Environment, Planning, Agriculture and Livestock and Community Development and Social Welfare Officers	<p>of changes and inputs so as to ensure the project serves and protects people's environment regardless of the advantages it comes with;</p> <p>iii. The project should ensure it recognizes all the potential economic activities that it will disturb and pose technical mitigating measures;</p> <p>iv. Other mitigation measures like education and awareness programs should be out into effect. Such impacts include family breakages and presence of street children;</p> <p>v. The local government leaders should ensure they provide a lot awareness programs to citizens on utilizing all possible economic opportunities and benefit from the project;</p> <p>vi. Fairness in assessing of properties especially to the project affected persons and a timely compensation so as to provide them with an ample time to look for other places to resume their lives in relation to the economic activities they are engaged in;</p> <p>vii. 90% of the people around the Uyui area are mostly engaged in cultivation of various crops like maize, paddy and tobacco thus the TRC should ensure the areas still have the fertility for production purposes especially the areas that the project will be passing;</p> <p>viii. The environmental officer insisted on installation of proper solid and water wastes in project sites so as to preserve the environment;</p> <p>ix. The district council collects revenue from the sale of different building materials like stones and pebbles thus the government will collect more revenue since the project area might need the available materials for the construction of the SGR;</p> <p>x. The district has no dumping site so the presence of the project might pose a great need of the dumping in terms of looking for funds to facilitate its construction and serving not only people for the SGR project but rather be used after post construction era;</p> <p>xi. The SGR project has to have a proper management of the hazardous waste like chemicals that might be used during the construction phase and thus not improperly handling them hence environment destruction. TRC should get into contact with a registered hazardous waste collector for proper handling of the waste;</p> <p>xii. Land clearance during mobilization should be well placed with tree planting programs so as to preserve the loss of vegetation and conserve the environment;</p>	All matters of concern from the DED office and accompanied Departments will be adhered to

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			xiii. Dust control mechanism like watering of roads during the construction of the railway activities might ensure a minimal dust spread; xiv. There should also be plan for provision of awareness on spread of diseases like HIV/AIDS due to population increase and high social interaction; xv. The planning officer emphasized on the Community Social Responsibility (CSR) plans should be shared with the DED and her team to ensure are well incorporated in their plans; and xvi. Assessment of grave removal areas should be done under the country laws and regulation in relation with people's customs and traditions.	
Mr. Grace N. Mwenyali	TANESCO Uyui District	District Manager	TANESCO office in Uyui district as one of the stakeholders of the SGR project should be involved on especially if reallocation of TANESCO's infrastructures is needed The institution will benefit from the presence of the project because it will acquire another potential customer due to the project needing electricity energy for its operation TRC as a client who owns the SGR project will be responsible for the reallocation of TANESCO infrastructures if a need arises At the same time, TANESCO might lose other customers due to the disturbance of electricity line reallocation Business that rely on the power energy might be also affected due to the change	The proponent will comply with the raised issues
Ms. Catherine Mushi	RUWASA- District Office	Ag District Manager	All communities and institutions involved including RUWASA must be consulted especially on areas where water infrastructures are found; TRC has to present all designs of the project to RUWASA for review of areas that contain water infrastructures for assessment; Cases of water infrastructures destruction in the rural areas are mostly due to invasion of livestock keepers; Early assessment will assist on a technical reallocation of water sources infrastructures without affecting the supply of water users; and RUWASA will also benefit from the project by adding more water users from all phases of the project including mobilization to operations stage especially on areas that will need water like railway stations.	All RUWASA matters of concern will be considered
			i. TRC has already presented its designs for review and TARURA has already reviewed for change in order to meet demands on the project sites for possible change of routes;	

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ng. Rahabu L. Thomas	TARURA District Office, Uyui DC	Ag District Manager	<ul style="list-style-type: none"> <li>ii. All open pits during construction have to be managed in order to prevent over flow of water which might lead to floods and destroying roads; and</li> <li>iii. If a need for construction of new roads to facilitate the project especially during construction phase, TRC has to consulted for technical guidelines and after use, the roads will be under TARURA for maintenance as per Road Act of 2007.</li> </ul>	The proponent will comply with the raised issues
enis wasema	Tanzania Forest Services	District Forest Officer	<p>Currently, the SGR project doesn't pass o Uyui District forests;</p> <p>If on the later the projects design will change, then TFS Uyui districts urges to be involved as to preserve the ecosystem and the environment of the whole area surrounding the project site; and</p> <p>All special areas of animal corridors are to be preserved and if necessary, as per conservation rules guide, bridges are to be constructed to preserve and protect the whole ecosystem of the project site.</p>	The proponent will comply with the raised issues
Ulimakafu VDC Members	Ulimakafu Village Usila Ward	VDC	<ul style="list-style-type: none"> <li>i. The presence of the SGR project will increase a number of entrepreneurship in communities around the project area;</li> <li>ii. Availability of employment opportunities for the working group especially the youth hence reducing social problems like theft due to unemployment;</li> <li>iii. A fair assessment and compensation to the project affected persons should be considered in order to prevent conflicts between the government and its people;</li> <li>iv. The SGR project will ease the transportation sector by providing a fast transport means of people and goods in a huge number thus boosting economy from an individual level to the counties' GDP;</li> <li>v. On the other hand, the SGR project will pose a number of challenges including people's properties especially lands will be taken for construction of the railway regardless compensation which might not be enough to buy land and build residence with the current high living standards;</li> <li>vi. Open pit areas from the construction activities may lead to environmental problems like soil degradation around the project site;</li> <li>vii. Presence of dust during construction phase might cause some health problems to the communities living by the project site;</li> <li>viii. Loss of vegetation after land clearance;</li> </ul>	Ulimakafu VDC issues raised will be adhered to



Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>ix. Family breakages and presence of street children due to high rate of interaction with other people from other places of the project site; and</li> <li>x. There might also be an increase of accidents around the communities surrounding the project site if there will be no enough precaution taken.</li> </ul>	
Mpenge VDC members	Mpenge Village Office	VDC	<ul style="list-style-type: none"> <li>i. There will be an increase of employment opportunities in the area of the project for youth working group;</li> <li>ii. Easy transport means of goods and people to different areas of the country to boost economy;</li> <li>iii. Improvement of other social serves and infrastructures due to increase of population;</li> <li>iv. Improvement of transport infrastructures like roads to facilitate easy path for construction phase;</li> <li>v. Economy of the communities surrounding the project area will increase;</li> <li>vi. Beautification of area that the railway line will pass;</li> <li>vii. Decrease of crimes due to availability of employment and business opportunities;</li> <li>viii. Unfriendly environment conservation practices will decrease like deforestation;</li> <li>ix. SGR project will also increase spread of disease due to increase in population</li> <li>x. Moral erosion among youth;</li> <li>xi. Indigenous traditions and customs will be interfered from a mass influx around the project areas;</li> <li>xii. Increase of child labor and abuse in search of economic opportunities;</li> <li>xiii. Family breakages and street children increase in number due to high interaction of people; and Resettlement of the projected affected persons that might disturbed their daily economic activities like business and agriculture</li> </ul>	Mpenge VDC members' views and concerns will be adhered to
Ndono VDC members	Ndono village	VDC	<ul style="list-style-type: none"> <li>i. There will be an increase of employment opportunities; More business and entrepreneurship opportunities will increase in number thus boosting the native areas economy;</li> <li>ii. The communities surrounding the project site will do more business due to availability of markets from population increase;</li> <li>v. Other projects will eventually start during the start of the SGR project of which after the project will be accomplished, such businesses will benefit the communities;</li> </ul>	The proponent will comply with the raised issues

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>. Increase of population might cause demand for land for different economic activities like agriculture especially after the SGR projects comes to an end;</li> <li>i. Environmental disturbance due to presence of dust, air and noise pollution especially during the construction phase;</li> <li>ii. Disturbances from a tradition and customs aspect by removal of graves and other cultural sites around the project site;</li> <li>iii. Increase of spread of diseases of both communicable and non-communicable like HIV/AIDS;</li> <li>x. Increase of family breakages and street children among communities surrounding the project site;</li> <li>. More accidents cases will rise due to increase of construction vehicles like trucks; and</li> <li>i. From past projects of roads, there might be unfair assessment of properties and compensation especially to project affected persons.</li> </ul>	
Utemini VDC members	Utemini Village	VDC	<p>Assessment of like houses and agriculture farms and other properties of the affected person of the project should be fairly assessed and a timely compensation for the affected persons to resettle in other places before takeoff of the project;</p> <ul style="list-style-type: none"> <li>i. Increase in population might lead to availability of various economic activities like employment, business and entrepreneurship;</li> <li>ii. Employment opportunities should be benefiting mostly the indigenous working group in Utemini village rather than people from other places;</li> <li>v. Business and entrepreneurship opportunities especially to women can be well utilized;</li> <li>. The communities surrounding the SGR project including Utemini village should also be assisted by the government via Corporate social responsibility projects that may benefit all groups in the village especially the vulnerable ones who may not enjoy the strait benefit of the GR project;</li> <li>i. Youth group will have to be creative in creating other small business projects and not merely depending on the employment opportunities of which a number of times they come in few;</li> <li>ii. Presence of dust and other pollution like air and noise might lead to diseases hence precautions measures are to be taken;</li> <li>iii. Afforestation programs should be out into effect after land clearance that will lead to loss of vegetation thus conserving the environment; and</li> <li>x. Diversion of roads that are used by the Utemini village might cause disturbance hence alternative roads should</li> </ul>	The TRC will comply with the raised concerns

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			be constructed to ease people's movement to one place to the other .	
Mabama VDC members	Mabama Village	VDC	<p>Increase in business and entrepreneurship opportunities;</p> <p>i. Economic growth of Mabama village will raise and the village government will collect more revenue;</p> <p>ii. Increase of employment opportunities especially to the indigenous youth group in Mabama village;</p> <p>v. Improvement of other social services and infrastructures like schools and health facilities to serve the increased population;</p> <p>. Various building materials like stones and pebbles will gain market and increase profit to the businessmen and women;</p> <p>i. Environment degradation due to land clearance and loss vegetation might pose challenges to the environment by the SGR project activities;</p> <p>ii. Increase of early pregnancies especially to children and youth and affecting their lives due to increase of moral erosion;</p> <p>iii. Increase of cases of family breakages and street children due to past projects experience;</p> <p>x. Cultural interference on traditions and customs of the indigenous people;</p> <p>. Availability of employment opportunities to the working group and mostly they benefit the indigenous youth;</p> <p>i. Unfair assessment of the properties of the projects affected people which might lead to psychological problems hence a fair compensation should be adhere to;</p> <p>ii. Enough SGR project awareness and education should be enhanced before the start of the project especially on benefits and challenges the project might bring to the communities surround the project site; and</p> <p>iii. Increase of accidents due to increase of construction vehicles hence enough safety measures are to be fully considered.</p>	All matters of concerns of Mabama VDC members will be considered by the Project Proponent
<b>TABORA MUNICIPAL</b>				
Abraham H. Indeme	Regional Commissioner Tabora	REME	<p>The Regional Environmental management officer on behalf of the regional commissioner outlined a number of socio-economic and environmental issues to be of concerned as far as SGR project is concerned;</p> <p>i. There are places of conservation within the project site that have to be considered so as to preserve them on various villages on the railway line;</p> <p>ii. Several water sources are also allocated along the line thus the responsible authorities have to be consulted on</p>	All environmental and socioeconomic matters of concern will be adhered to by the TRC

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			<p>how to manage them and not letting the project activities destroy them;</p> <p>v. The project might also disturb the animal corridor thus alternative ways should be advised so as to prohibit the destruction of the ecosystem;</p> <p>. The various ridges built to support the railway line might cause floods in the long run thus precautionary measures should be taken into account;</p> <p>i. There will also be a loss of vegetation on the area hence a number of rehabilitation measure should be programed to ensure the any form of environmental degradation;</p> <p>ii. Presence of various socio-economic advantages will be spelled out to benefit the surrounding communities that the project will be constructed nearby;</p> <p>iii. Employment opportunities will be available for different working groups in the community and the local content should be ensured;</p> <p>x. Availability of business and entrepreneurship opportunities will be available to boost people's income and economic growth;</p> <p>. Other social interaction outcome like spread of diseases will be present in the project areas due to the population increase;</p> <p>i. Family breakages and street children might increase within the communities; and</p> <p>ii. Increase in accidents due to availability of construction vehicles like trucks and other movable machinery.</p>	
Ms Asha Churu	District Commissioner Office	District Administrative Secretary	<p>TRC should ensure they adhere to the EIA report on various environmental and socio-economic impact of the project and their mitigation measures so as to ensure the project poses a lot of advantages.</p> <p>i. The client should ensure all stakeholders are involved so as to reduce the negative impacts of the project</p> <p>ii. Various gases and emissions are expected to be found on the project site due to presence of a lot of dust and pollutions of air and noise thus prevention mechanisms are advised to be followed adequately;</p> <p>v. All sorts of waste including water solid and hazardous waste should be well constructed to ensure ease management so as to preserve the environment;</p> <p>. Awareness should be prior given to communities on presence of various communicable and non-communicable disease due to the increase in population;</p> <p>i. All precaution signs for road users should be well installed on all places of the project site so as to prevent occurrence of accidents; and</p>	All DC's directives and suggestions will be put into effect.

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			<ul style="list-style-type: none"> <li>ii. All employment opportunities should well benefit the indigenous and other working groups in the communities especially the youth.</li> </ul>	
<p>lias M. ayandamla</p>	<p>Tabora Municipal</p>	<p>Municipal Director and Departments of Planning, Lands, Community Development, Environment and Agriculture and Livestock Officers</p>	<p>The DED emphasized on the importance of the SGR project because it is a strategic project that has a purpose to boost economy of the while country by having an easy move of people and goods within the country and the neighboring countries;</p> <ul style="list-style-type: none"> <li>i. The district planner pointed on the essence of having a clear resettlement plan for the project affected persons and a fair assessment of their properties and a timely compensation so as to facilitate the affected people to have enough time to resettle;</li> <li>ii. Availability of proper dumping site for the derived wastes around the project sites;</li> <li>v. The environmental officer insisted on the SGR project to have implementable deforestation programs for the areas that will experience land clearance and loss of vegetation;</li> <li>. Enough latrines should be constructed to in all places of the project site socially for hygienical and health of the workers during the construction phase;</li> <li>i. The Community development officer cautioned the TRC on high spread of various diseases both of communicable and non-communicable thus enough awareness is needed in collaboration with the local government leaders;</li> <li>ii. High rates of women and children abuse especially in search of employment, business and entrepreneurs opportunities;</li> <li>iii. The presence of the SGR project might affect the economic activities such as agricultural and livestock keeping to be fully affected thus alternative means should be made aware so as to reduce lots of confusion and disturbances in the communities;</li> <li>x. Pollution to the environment due to the presence of dust hence air and noise pollution too;</li> <li>. Increase rates in child abuse and child labor in search of employment opportunities;</li> <li>i. There will also be a destruction of water sources thus the authorities overseeing the sources should be made aware of the SGR project so as to advise the handling of the sources to ensure they are not destructed;</li> <li>ii. There should be a clear explanation from the TRC on if the project will have to impact buildings and the way forward in terms of the assessment and compensation matters;</li> <li>iii. The project should also state the most manageable ways to handle hydrocarbon spills since they have a</li> </ul>	<p>All issues raised by this office will be complied by the TRC</p>

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			<p>huge impact to the environment as they destroy the living organisms in the soil and thus affecting the areas fertility;</p> <p>iv. Breakages of rock walls that will cause a lot of dust and affecting the people's health should be taken into an account;</p> <p>v. The district agricultural officer emphasized on the reallocation of farmers and livestock keepers in terms of providing them with alternative farms so as to ensure their income and economic statuses are not disturbed;</p> <p>vi. Reallocation of places to feed cows and other livestock animals should be encountered for during the construction phase</p> <p>vii. The dip owners should be well consulted on the friendly reallocation of the available dips;</p> <p>viii. Vulnerable groups like elderly and people with different disabilities should also enjoy the available opportunities by being fully considered and being enacted clear road signs so as they can also be safe regardless of the construction activities;</p> <p>ix. Fair assessment of the properties and timely compensation should be put into consideration;</p> <p>x. A clear mechanism of dust control should be made awarefor all communities surrounding the project site and prevention of spread of diseases like chest pains and the related diseases; and</p> <p>xiii. Waste water treatment facilities should be available on the SGR project site.</p>	
ng. ayungaKashi mu-	TUWASA	Managing Director	<p>i. There are various water sources around Tabora municipality that need to be conserved for water supply purposes;</p> <p>ii. Waste water generation is of high quantity;</p> <p>iii. There is currently no solid waste management for the Tabora municipality. 92% of water users are not connected to the waste management system;</p> <p>iv. At the moment, waste water is collected by special boozers and taken to waste water collection areas;</p> <p>v. The projected SGR project is expected to have slag points and currently the Tanzanian central government has provided funds amounting to 1.26 billion to construct other slap points within the Tabora municipality so as to meet the current and expected demands;</p> <p>vi. On the other hand, TUWASA has no obstacle to the SGR project because they will add more customers of water users living alone the advantages it will have to the communities and the country at large; and</p> <p>vii. TUWASA is to be fully engaged as part of the stakeholders especially on places that TUWASA infrastructures will need to be reallocated to pave way</p>	The Proponent will be advised accordingly

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			for the SGR project or rather rerouting the SGR project on areas that the TUWASA infrastructures cannot be reallocated.	
Mr. SF Omari Mba	Fire and Rescue Force	Staff Officer	<ul style="list-style-type: none"> <li>i. Fire and Rescue team has a mandate to protect all people and their properties;</li> <li>ii. All the architectural drawings of the SGR project have to be presented to the Fire rescue team for review and advising accordingly on fire prevention area of concentration within the whole area of the project site;</li> <li>iii. There should be a periodic monitoring of the SGR project on Fire prevention matters in all stages of the project from mobilization, construction and operations phases;</li> <li>iv. Fire team will provide all technical support need to the project for its effectiveness and prevention of Fire issues that will destroy the project infrastructures;</li> <li>v. Furthermore, the bridges that will be constructed should be allocated far from people's residence;</li> <li>vi. In all SGR stations, there should be an installation of fire equipment that also have to be timely serviced to ensure fire control during fire outbreak;</li> <li>vii. The drawing designs for the station should also be presented for review and approval; and</li> <li>viii. TRC should ensure all fire prevention services are paid that include fire services during pre and post construction era with all trainings involved and annual fee payment.</li> </ul>	All fire and rescue matters raised will be considered and adhered to
Mr. Felix Mwinuka	TANESCO	Ag. Zonal Manager	<ul style="list-style-type: none"> <li>i. TANESCO is well pleased of the SGR project because it will benefit the institution by selling of power for its operation confirmation of all TANESCO infrastructures that the SGR line;</li> <li>ii. There should be a passes through for their reallocation and solving matters that will involve interacting with other transmission line the lines serving REA projects;</li> <li>iii. The SGR project may trigger TANESCO to have more electricity supply sources to ensure its maximum supply to all users from household, institutions and industrial levels; and</li> <li>iv. By the agreement between TANESCO nad TRC, there will be a special supply of electricity for the SGR project so as to ensure constant supply of the energy source for its operation due to the fact that electricity will be the main source for the project.</li> </ul>	TANESCO issues will be adhered to.
			<ul style="list-style-type: none"> <li>i. TANROADS as other stakeholders of the project should be well involved in all stages of the project especially places that roads will interact with the railway project;</li> </ul>	All TANROADS concerns and advices will be considered

ame	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
ng. Joram lex	TANROADS	Ag IMU	<ul style="list-style-type: none"> <li>ii. In all types of roads including regional and district roads, maintenance of such roads should be well monitored;</li> <li>iii. SGR should ensure that they observe all procedures to have a permit to construct service roads that will be used during all phases of the project from all road's authority agencies like TANROADS and TARURA. This will assist the current roads are well preserved for other users;</li> <li>iv. On special occasions, TANROADS can provide a pass by permit for construction vehicles that carry building materials to pass on TANRODS roads if necessity will be observed;</li> <li>v. There should be enough signs along the project site to ensure safety;</li> <li>vi. Other impacts of the SGR project should be made well aware to the communities surrounding the project site like diseases and pollution. Such impacts need awareness programs so to ensure its prevention; and</li> <li>vii. There should also be a well pollution control impacts like dust especially from roads that will be used by the projects to prevent eruption of diseases.</li> </ul>	
ACC brantino lyiye	Tanzania Forest Services (TFS)	Zonal Manager, Western Zone	<ul style="list-style-type: none"> <li>i. The TFS institutions is one of the main stakeholders of the SGR project because there are places the project will pass like forests and thus TFS guidelines will be needed;</li> <li>ii. The SGR railway line is expected to pass through various forests like Mpanda line, Migifu forest, Lunde and Mkuti and other forests found in Uvinza as far as the Tabora to Kigoma SGR line is concerned;</li> <li>iii. Land clearance is expected to take place in paving way of the SGR line thus loss of vegetation might be an outcome hence rehabilitation measures are to be taken;</li> <li>iv. There are animal corridors along the forests area that should be considered and preserved by rerouting the railway line;</li> <li>v. Proper control of the environment around the project area should be effective to prohibit possible environmental impacts of the project like air and noise pollution and dust; and</li> <li>vi. Presence of the SGR project will ease transportation of forests products like timber to be easily transported from forests areas to market places around the country via the railway transportation means.</li> </ul>	TFS issues will be fully addressed
			<ul style="list-style-type: none"> <li>i. There are several animals that are found around along the project site like lions, elephants, leopard and wild dogs that need to be recognized for safety purposes;</li> </ul>	All TAWA concerns will be adhered to



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Mwinyi Machihangu	Tanzania Wildlife Management Authority (TAWA)	Wildlife Officer	<ul style="list-style-type: none"> <li>ii. SGR should ensure all animal corridors are preserved so to preserve the ecosystem around the area. If the railway line passes through the animal corridor, underpass routes of the railway are advised so as to the preserve the corridors;</li> <li>iii. Contrary to other stakeholders, TAWA has been lowly involved especially on area that TAWA are overseeing like forests and other preserved areas thus TAWA needs to be engaged in order to necessary inputs especially on areas of their concern;</li> <li>iv. Poaching activities might increase due to the easy transportation of wildlife animals' meat thus TAWA looks forward on strengthening their check points especially on station areas; and</li> <li>v. Construction on underpass routes around animal corridors so as to protect and preserve the ecosystem surrounding the area.</li> </ul>	
Mthumani Mhona	Lake Tanganyika Basin Water Board	Assistant Director	<ul style="list-style-type: none"> <li>i. The L. Tanganyika Basin oversees all water sources in regions of Tabora, Katavi, Geita, Kagera, Shinyanga and parts of Singida regions of which all these regions have various water sources of rivers and streams that flow their water into L. Tanganyika;</li> <li>ii. The L. Tanganyika urges to be involved by TRC as the SGR project is concerned so as to make TRC aware of all water sources that are found on railway lot 6 line in order to protect and preserve all the sources from all the phases of the project from mobilization to operations level;</li> <li>iii. The communication between TRC and L. Tanganyika will assist on water sources pollution and at times if necessary, special permits will be granted by Tanganyika basin to diverge water sources;</li> <li>iv. The LTBWB poses a possible challenge on blocking water sources during construction phase that will have an effect on easy flow water and affect water supply to areas that depend on the sources; and</li> <li>v. Other issues like harvesting water around project sites for construction usage should have permission from the LTBWB.</li> </ul>	All LTBW matters will considered
Mwinyi Mwamsema	CODEWA	Executive Secretary	<ul style="list-style-type: none"> <li>i. Community Development Watch is a non-organization that deals with programs of health and education to youths found in Tabora;</li> <li>ii. CODEWA states on creation of more opportunities from an environmental and socio-economic aspects that will come in place after the project takes off and not merely depending on employment opportunities that comes with limited number,</li> <li>iii. With the presence of the SGR project in Tabora region, CODEWA will have more effect on conducting education and awareness programs to all the working group especially the youth and women on how to</li> </ul>	TRC will cooperate with CODEWA in areas that need education and awareness as SGR project is concerned

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			<p>exploit a number of opportunities thus enjoying the benefits of the SGR project;</p> <p>iv. The challenges facing Tabora youth is more on low self-esteem thus youth as a groups that the communities depend on need to change the mindset and investing on education to reduce poverty because at times they live such big projects to be benefitted with other people outside Tabora region;</p> <p>v. The NGO partners with different donors around the world like France, UK, Turkey and Venezuela amongst others in donating funds for children and youth groups in need in various communities;</p> <p>vi. CODEWA currently operates in Tabora but expects to stretch in other places in Tanzania so as to and health; and</p> <p>vii. CODEWA will cooperate with all the stakeholders of the SGR project on assuring all the working group around Tabora benefits from the project with all the benefits it will come with.</p>	
ng. Timothy umbi	TARURA	Ag District Manager	<p>i. The Project will stimulate economic growth;</p> <p>ii. Farmers may stumble economically from being shifted from their lands and losing their crops, trees and homes, they will have to start all over;</p> <p>iii. Project should be responsible to repair infrastructure which they may destroy;</p> <p>iv. Noise disturbance/ Noise pollution to the community;</p> <p>v. Air pollution through dust produced during heavy vehicles transporting materials;</p> <p>vi. Destruction of natural resources;</p> <p>vii. Road maintenance during the construction;</p> <p>viii. Vehicles should be covered when transporting construction materials to prevent environmental pollution;</p> <p>ix. Deforestation;</p> <p>x. All boreholes produced by the project during construction should be refilled; and</p> <p>xi. Afforestation should be conducted to the affected areas.</p>	All TARURA concerns will be considered
<b>URAMBO</b>				
enani L ihongosi	District Commissioner's office	District Commissioner	<p>i. They welcomed the project and the office is ready to provide any support they might need.</p> <p>ii. Ambitious to see the project continue;</p> <p>iii. Employment opportunities should be widely spread to the locals of Urambo district</p> <p>iv. They are optimistic that the project will bring economic growth to the community</p>	<p>i. The proponent will bring economic growth to the community</p> <p>ii. The proponent will ensure that whenever there are employment opportunities, they will be announced to</p>

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				the locals so that they can get a chance to apply
Grace S Quintine	Urambo District Council office	District Executive Director (DED)	<ul style="list-style-type: none"> <li>i. Welcomed the project and the office is ready to provide any support;</li> <li>ii. The project should liaise with rules, guidelines and regulations of the local government, including environmental laws; and</li> <li>iii. Project should be responsible to repair infrastructure which they may destroy the laws regarding mining of minerals should be complied.</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will liaise with all rules, guidelines, and regulations of the local government;</li> <li>ii. The proponent will comply to all mining laws; and</li> <li>iii. The proponent will be responsible to repair infrastructure which they may destroy.</li> </ul>
Stanford Jacob	District Council Management Team	Ag TFO	<ul style="list-style-type: none"> <li>i. There is no forest reserve in the district;</li> <li>ii. There is a garden owned by the district council which might be within the railway's reserve, issue of compensation to the district council should be addressed; and</li> <li>iii. All boreholes produced by the project during construction should be refilled.</li> </ul>	The proponent will ensure all boreholes from the project construction are refilled
Joseph Mihogora	District Council Management Team	Ag DNRECO	<ul style="list-style-type: none"> <li>i. There is a garden owned by the district council which might be within the railway's reserve, issue of compensation to the district council should be addressed</li> <li>ii. The project should ensure proper sorting of wastes</li> </ul>	The proponent will ensure all affected infrastructure will be compensated
Madrack W Momba	District Council Management Team	DEMO	<ul style="list-style-type: none"> <li>i. The project should ensure proper sorting of wastes of all types (Solid, liquid);</li> <li>ii. Project should ensure to promote habit of watering the site to reduce amount of dusts;</li> <li>iii. Noise pollution should be controlled by the project during construction activities; and</li> <li>iv. The ESIA report of the project should also be submitted to the DC's office.</li> </ul>	<p>The proponent will ensure all wastes types are collected and sorted accordingly:</p> <ul style="list-style-type: none"> <li>i. The proponent will ensure their site is regularly watered to reduce amounts of dust emission</li> <li>ii. The proponent will ensure noise pollution is controlled during construction phase</li> </ul>
pendo E		Ag CO	<ul style="list-style-type: none"> <li>i. The project should ensure proper sorting of wastes of all types (Solid, liquid)</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will ensure all wastes types are collected and sorted accordingly</li> </ul>

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makpinti	District Council Management Team		<ul style="list-style-type: none"> <li>ii. Project should ensure to promote habit of watering the site to reduce amount of dusts</li> <li>iii. Noise pollution should be controlled by the project during construction activities</li> <li>iv. The ESIA report of the project should also be submitted to the DC's office</li> </ul>	<ul style="list-style-type: none"> <li>ii. The proponent will ensure their site is regularly watered to reduce amounts of dust emission</li> <li>iii. The proponent will ensure noise pollution is controlled during the construction phase.</li> </ul>
r. David M yambaya	District Council Management Team	DMO	<ul style="list-style-type: none"> <li>i. Complimented that the project will simplify transportation of medicine from one place to another;</li> <li>ii. The project will help in donating to the community, which will promote economic growth;</li> <li>iii. There may be a risk of outbreak of disease due to population increase such as airborne diseases, Sexual transmitted diseases, epidemic and pandemic diseases;</li> <li>iv. Unplanned/ early pregnancies may increase; and</li> <li>v. Project should ensure there are Banners with message of combating diseases, especially HIV/AIDS.</li> </ul>	The project will ensure to initiate campaigns against HIV/AIDS
sha Abdul	District Council Management Team	Ag DE	<ul style="list-style-type: none"> <li>i. There should be early identification of infrastructures within the railway's reserve</li> <li>ii. There should be early identification of project stations for land planning</li> </ul>	The proponent shall identify all infrastructure within the railway's reserve
dward C umanyika	District Council Management Team	DICTO	<ul style="list-style-type: none"> <li>i. The project may lead to breakup of marriages and increase of single parenting</li> <li>ii. What procedures will the project take during grave removal since the activity will require second funeral</li> </ul>	The proponent shall identify all infrastructure within the railway's reserve
adick lagesa	District Council Management Team	EO	<ul style="list-style-type: none"> <li>i. Complimented that the project will ensure quick and efficient transportation of perishable goods/ crops;</li> <li>ii. There will be decrease of available land size for farming which will reduce agricultural productivity;</li> <li>iii. Needs to know If the railway will have a fly over;</li> <li>iv. The project may result to conflicts for water between farmers and pastoralists; and</li> <li>v. There may be a possibility of rise of prices due to increase of population with high purchasing power</li> </ul>	The proponent will ensure not to create any kind of conflicts and address all crucial matters
indu ubuma	District Council Management Team	DT	Project should comply with all taxes imposed without complaint	The proponent will comply with all imposed taxes
harles S andrew	TFS		<ul style="list-style-type: none"> <li>i. The project has not affected Ugala reserve;</li> <li>ii. The project will bring massive development to the district;</li> <li>iii. The project will increase employment opportunities;</li> </ul>	The proponent will comply with all imposed

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Sebastian Shio		District Manager	and iv. The project should refill any pits and plant trees	taxes
Araka M. Munga	TAWA	District Manager	i. The project has not affected the entire 90% of RAMSA reserve, only villagers' land has been affected; ii. The project will increase tourism in the Ramsa reserve; iii. Ecologically, the project will not harm wetlands nor its organisms; iv. Employment opportunities will increase; v. The project will lead to noise pollution which will disturb land animals; and vi. There may be risks of animals getting hit by the train, which the project needs to mitigate.	
Justin Sebastian Mlisieus Mgoza	TASAF	District Manager	i. The project will create improved transportation of both people and goods; ii. Costs of transport will decrease; iii. People will employ themselves and business will bloom; iv. There should be checkpoints; v. Farmers might stumble economically, so the project should ensure farmers are provided with adequate livelihood restoration; vi. Behavior change due to intermingling of people and such behaviors are like homosexuality; vii. Natural sources will be lost; viii. Wildlife may be lost; and ix. Project should also return to the community such as giving donations from time to time to building wells and schools.	The proponent will find any way to return to the community
Immanuale Mlay	Inland Development Tanzania	District Manager	i. The Project will stimulate economic growth; ii. The Project will bring risks of outbreak of STI's, especially HIV/AIDS; iii. The project will rise risk of deforestation, so it should consider to replant trees after cutting them down; iv. The project should encourage campaigns educating communities on HIV/AIDS; and v. The project should collaborate with Inland development in campaigns to promote afforestation after cutting down trees and HIV/AIDS campaigns.	The proponent will consider collaborating with Inland development Tanzania to initiate HIV/AIDS and afforestation campaigns for the welfare of the community
Timothy Jambidi	TARURA	District Manager	i. The Project will stimulate economic growth; ii. Production will be increased due to improved transport; iii. Farmers may stumble economically from being shifted from their lands and losing their crops, trees and homes, they will have to start all over; iv. Project should be responsible to repair infrastructure which they may destroy; v. Noise disturbance/ Noise pollution to the community;	i. The proponent will make sure management, maintenance, axle load control, environmental and road reserve managing.

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			<ul style="list-style-type: none"> <li>vi. Air pollution through dust produced during heavy vehicles transporting materials;</li> <li>vii. Destruction of natural resources;</li> <li>viii. Road maintenance during the construction;</li> <li>ix. Vehicles should be covered when transporting construction materials to prevent environmental pollution;</li> <li>x. Deforestation;</li> <li>xi. All boreholes produced by the project during construction should be refilled;</li> <li>xii. Afforestation should be conducted to the affected areas;</li> <li>xiii. Job creation for both temporary and permanent;</li> <li>xiv. Increased population along project area that will open up business opportunities;</li> <li>xv. Improves transport services by reducing travel time and increasing comfortability;</li> <li>xvi. Noise and vibration pollution from equipment, machines, Trucks and vehicles;</li> <li>xvii. Dust emission from trucks, vehicles movement and excavation activities</li> <li>xviii. Interference with service Utilities;</li> <li>xix. Clearing of plants species;</li> <li>xx. Transmission of social diseases (HIV and STDs);</li> <li>xxi. Traffic accidents;</li> <li>xxii. Work related incidences such as falling of objects; and</li> <li>xxiii. The identified negative outcomes should be managed through the proposed mitigation measures and implementation regime that will be laid down.</li> </ul>	<ul style="list-style-type: none"> <li>ii. The proponent shall identify all infrastructure within the railway's reserve</li> <li>iii. The proponent will consider initiating HIV/AIDS and afforestation campaigns for the welfare of the community</li> </ul>
Elias Erasto Makai	Fire and Rescue Force	District Commander	<ul style="list-style-type: none"> <li>i. Fire and Rescue Force should be involved during operation of the project, to provide safety awareness and cautions to deal with fire accidents when they occur;</li> <li>ii. There may be a possibility of rise of prices due to increase of population;</li> <li>iii. Revenues will increase as a result of the project, through trainings and registration fees of new premises; and</li> <li>iv. In every camp established by the project, the proponent should ensure that the fire marshal is there and fire protection equipment are installed and serviced on time</li> </ul>	<p>The proponent will ensure that there are fire marshals and fire protection equipment installed at campsites and serviced on time</p>
			<ul style="list-style-type: none"> <li>i. Employment will increase due to the project;</li> <li>ii. The project will make the district grow economically;</li> <li>iii. There will be development in business and general lifestyle;</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will make sure to compensate project affected persons on time</li> </ul>

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yamagwila laagi	TANESCO	District Manager	<ul style="list-style-type: none"> <li>iv. Farmers may stumble economically from being shifted from their lands and losing their crops, trees and homes, they will have to start all over;</li> <li>v. Education on proper use of compensation should be provided to project affected persons;</li> <li>vi. Compensation money should be provided on time to the project affected persons; and</li> <li>vii. The project has not affected any electrical infrastructure from TANESCO</li> </ul> <p>The project should be complete in the time frame it has set.</p>	
ussein lachoka	RUWASA		<ul style="list-style-type: none"> <li>i. There will be economic prosperity as a result of the project;</li> <li>ii. The project will bloom economic opportunities throughout the district;</li> <li>iii. The project should make sure to take all environmental conservation measures and most especially prevent pollution of water sources; and</li> <li>iv. The wells that project may drill during construction phase should be left for the community once construction is complete.</li> </ul>	The proponent will ensure to follow all environmental conservation guidelines
ame	WDC	Urambo	<ul style="list-style-type: none"> <li>i. Claims the locals were given tests for three to six days without pay and employment, and so they feel exploited from this</li> <li>ii. The locals wrote letters for employment application but they have not been given any response. Most locals fail to even travel to other regions, because they are waiting on their pending applications to be answered.</li> <li>iii. The project should prioritize employment opportunities to locals rather than outsiders</li> <li>iv. The project should prioritize on hiring employees based on practical skill rather than certification so as to give chance to employment for locals who haven't gone to school but are naturally skilled and talented</li> <li>v. Claims that foreman of the project hire employees based on connections and bribes, therefore they request for this favoritism to be stopped</li> <li>vi. The project should hire employees of all ages, there are complaints that some locals with over thirty (35) years of age were rejected from applying to the project</li> <li>vii. Optimistic for the growth of business that</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will make sure to combat all forms of corruption, especially in employment</li> <li>ii. The proponent will make sure to prioritize locals for employment opportunities</li> <li>iii. The proponent will ensure fair selection of employees</li> <li>iv. The proponent will ensure to give feedback to job applicants on time</li> </ul>

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			<p>will be brought by the project</p> <p>viii. Optimistic for the improved efficiency of transportation services in the ward</p> <p>ix. The project has enabled several locals to employ themselves such as in food catering</p> <p>x. The project will increase the population of the community, which may be both good and risky, but hopeful that the good of the project will outweigh the bad</p>	
	WDC	Mchikichini	<p>i. The project should prioritize on hiring employees based on practical skill rather than certification so as to give chance to employment for locals who haven't gone to school but are naturally skilled and talented</p> <p>ii. Optimistic for the growth of business that will be brought by the project</p> <p>iii. Optimistic for the improved efficiency of transportation services in the ward</p> <p>iv. The project should provide employment opportunities to women of the community, such as in cooking, driving, machine working and so on.</p> <p>v. The project should provide employment opportunities to locals of all ages, including the elderly</p> <p>vi. Optimistic for the future of the ward</p>	
	WDC	Kiyungi	<p>i. Optimistic for the growth of business and increase of money circulation that will be brought by the project</p> <p>ii. Optimistic for the future of the youth</p> <p>iii. The project should provide employment opportunities to youths and lower the criteria of experience so that recent graduates can get the chance of employment</p> <p>iv. The project should initiate campaigns to spread more information on the project and prevent any future tragedies such as accidents, spread of HIV/AIDS, sexual harassments etc.</p>	<p>i. The proponent will initiate different campaigns to educate the community</p> <p>ii. The proponent will ensure to provide employment opportunities to youths</p>
	VDC	Kariakoo Village Council	<p>i. Claims Compensation rates are low</p> <p>ii. There is lack of employment opportunities to the local people</p> <p>iii. Application letters from locals applying to work for the project are ignored</p> <p>iv. Women are in need of employment opportunities in the project</p> <p>v. Claims construction activities have started in some areas before compensating locals</p> <p>vi. Project is bringing employees from other regions instead of hiring locals</p>	<p>i. The proponent will make sure to combat all forms of corruption, especially in employment</p> <p>ii. The proponent will make sure to prioritize locals for</p>



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			<ul style="list-style-type: none"> <li>vii. Valuation of affected property is following which laws?</li> <li>viii. Project should prohibit their employees from sexually harassing young girls from the local communities</li> <li>ix. Projects is requested to develop affected local communities by improving social services through donations (CSR) such as donating in building new health centers, schools, water sources (wells)</li> </ul>	<ul style="list-style-type: none"> <li>employment opportunities</li> <li>iii. The proponent will ensure fair selection of employees</li> <li>iv. The proponent will ensure to give feedback to job applicants on time</li> </ul>
	VDC	Usongleni Village Council	<ul style="list-style-type: none"> <li>i. Compensation to project affected persons should be on time</li> <li>ii. Risks of outbreak of diseases due to population influx</li> <li>iii. Boreholes that will be dug open should be refilled and planted with trees</li> <li>iv. Risks of loss of indigenous trees, project needs to find a way to replant more trees to mitigate loss</li> <li>v. There should be avoidance of corruption in hiring workers for the project</li> <li>vi. Women need employment opportunities from the project</li> <li>vii. There should be further clarification to help PAPS understand the size of their land which is affected</li> <li>Elderly need employment opportunities from the project</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will make sure is preventing risks of outbreak of diseases both pandemic and epidemic.</li> <li>ii. The proponent will make sure Boreholes are refilled.</li> <li>iii. The proponent will make sure corruption in hiring workers for the project is strictly prohibited.</li> </ul>
	VDC	Usoke Village	<ul style="list-style-type: none"> <li>i. Compliments there will be improved transportation as a result of the project</li> <li>ii. There will be improved economic growth</li> <li>iii. There will be employment opportunities to local residents</li> <li>iv. There will be growth of the district</li> <li>v. Recommends that the railway station points should also be constructed at Usoke Ward to increase accessibility for the locals</li> <li>vi. Will help locals to gain more knowledge from the project</li> <li>vii. Village council should be involved in the project development</li> <li>viii. Compensation to project affected persons should be on time</li> <li>ix. Risks of outbreak of diseases due to population influx</li> <li>x. Boreholes that will be dug open should be refilled and planted with trees</li> <li>xi. Loss of indigenous trees will increase</li> <li>xii. There should be avoidance of snatching land of PAPS before compensation</li> <li>xiii. Risks of increase of accidents due to the project (crashing of train)</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will make sure following laws and rules of Tanzania on snatching land of PAPS before compensations.</li> </ul>

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			<ul style="list-style-type: none"> <li>xiv. Improved transportation which considers time and price</li> <li>xv. Project should prioritize employment opportunities to the local people instead of foreigners</li> <li>xvi. Payment of compensation to project affected persons should be on time</li> <li>xvii. Compensation should be provided to the PAPS fairly</li> <li>xviii. Income will likely decrease due to disruption of farming activities by the project, so the project should ensure livelihood restoration</li> <li>xix. There should be avoidance of corruption in hiring workers for the project</li> <li>xx. Women need employment opportunities from the project</li> <li>xxi. There should be further education to help PAPS understand the size of their lands which is affected by the project</li> <li>xxii. Elderly need employment opportunities from the project</li> </ul>	
	VDC	Sipungu village	<ul style="list-style-type: none"> <li>i. Project is welcomed and accepted by the community</li> <li>ii. Project is expected to provide employment opportunities to the locals</li> <li>iii. Project is expected to support the economic growth of the community especially through donations (CSR)</li> <li>iv. Elderly need employment opportunities from the project</li> <li>v. Women need employment opportunities from the project</li> <li>vi. There will be growth of the district</li> </ul> <p>Recommends that the railway station points should also be constructed at Usoke Ward to increase accessibility for the locals</p>	<ul style="list-style-type: none"> <li>i. The proponent will make sure employment opportunities to the local community.</li> </ul>
	VDC	Usisya Village	<ul style="list-style-type: none"> <li>i. Project should prioritize employment opportunities to the local people instead of foreigners</li> <li>ii. Understanding about the project is still small, so more education to the locals is needed</li> <li>iii. Project is requested to economically develop the affected local communities (CSR)</li> <li>iv. Optimistic about future employment opportunities to the locals</li> <li>v. Optimistic towards the project in growing business opportunities</li> <li>vi. Optimistic towards the project in beautifying the region and bringing more guests and potential investors</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will make sure is activating enough campaigns to the community in order to create awareness of the project.</li> <li>ii. The proponent will make sure to prioritize locals for employment opportunities</li> </ul>
	VDC	Itundu Village	<ul style="list-style-type: none"> <li>i. Criteria for applying for work at the project should be lowered, meaning that there should be less reliance on certifications but more prioritization on practical skill to give more chance to the locals to get employment</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will ensure to provide employment opportunities to youths</li> </ul>

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			<ul style="list-style-type: none"> <li>ii. The community well has been affected by the project, which is the community's biggest water source</li> <li>iii. The project should provide employment opportunities to youth and lower the criteria of experience so that recent graduates can get the chance of employment</li> <li>iv. There is a request to drill more wells for the community or dam as part of CSR</li> <li>v. Locals need to know the wideness of the project railway, to understand how much land size it will take from them</li> <li>vi. Women are requesting employment opportunities, such as cooking and driving</li> </ul>	<ul style="list-style-type: none"> <li>ii. The proponent will ensure rehabilitation of all infrastructures.</li> <li>iii. The proponent will ensure gender equality is considered in employment.</li> </ul>
	VDC	Mpigwa Village	<ul style="list-style-type: none"> <li>i. There is a request to help rebuild a kindergarten school in Jerad hamlet which has collapsed from natural forces. Donations are requested from the locals</li> <li>ii. Criteria for applying for work at the project should be lowered, meaning that there should be less reliance on certifications but more prioritization on practical skill to give more chance to the locals to get employment</li> <li>iii. Compliments will help improve transportation service in the community</li> <li>iv. Local businessmen will grow economically</li> <li>v. Risks of introduction of new diseases due to population influx. Project is requested to make sure project employees are vaccinated and tested before migrating into the local community</li> <li>vi. Women are requesting employment opportunities from the project</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will ensure avoidance of Risks of introducing new diseases due to population influx. Project is requested to make sure project employees are vaccinated and tested before migrating into the local community</li> </ul>
	VDC	Ulasa B Village	<ul style="list-style-type: none"> <li>i. Project will simplify transportation in the communities</li> <li>ii. Project is accepted by the locals, but they ask for employment to be prioritized to them</li> <li>iii. Project should prohibit its employees from snatching married women and breaking families</li> <li>iv. Project affected persons should be well informed, clarified and compensated</li> <li>v. The project should initiate campaigns to spread more information on the project and prevent any future tragedies such as accidents, spread of HIV/AIDS, sexual harassments and so on</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will initiate different campaigns to educate the community</li> </ul>
	VDC	Chekeleni Village	<ul style="list-style-type: none"> <li>i. Project is well accepted by the locals</li> <li>ii. Project will help in saving time in far travels</li> <li>iii. Project should encourage maximum safety protocols to avoid accidents</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will ensure is encouraging maximum safety protocols to avoid accidents</li> <li>ii. The proponent will ensure</li> </ul>

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			<ul style="list-style-type: none"> <li>iv. Employment opportunities should be prioritized to locals</li> <li>v. The project should leave something behind to the affected community as remembrance, such as wells and dams</li> <li>vi. The project should ensure to work with anti-corruption institutions at maximum capacity so as to avoid issues of corruption, especially in employment</li> <li>vii. The project should strictly prohibit its employees from sexually advancing young local girls and abandoning them with pregnancies and STD's</li> <li>viii. The project should ensure to give contracts to all of their employees, especially employees from the local communities</li> </ul>	<p>anti-corruption at maximum capacity so as to avoid issues of corruption, especially in employment</p>
	VDC	Motomoto village	<ul style="list-style-type: none"> <li>i. The project is a milestone for the community</li> <li>ii. The project should make sure to conserve the environment, especially in camp sites</li> <li>iii. Employment opportunities should be prioritized to the locals</li> <li>iv. There is a request to drill more wells for the community or dam as part of CSR</li> </ul> <p>The project should donate to community projects such as donations in building more health centers, quarters for health experts, and classrooms</p>	<ul style="list-style-type: none"> <li>i. The proponent will ensure conservation of the environment, especially in camp sites</li> </ul>
	VDC	Vumilia village	<ul style="list-style-type: none"> <li>i. The project will increase business opportunities within the community</li> <li>ii. Employment should be offered by the project to the youth</li> <li>iii. The project should ensure to address all risks that may lead to accidents</li> <li>iv. Check lines should be present in most or every village</li> <li>v. The project may bring risks of STD's and unplanned pregnancies</li> <li>vi. The project should prohibit its employees from sexually harassing both young girls and boys</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will ensure laws and regulations will be strictly observed in sexually harassment activities.</li> </ul>
	VDC	Uhuru village	<ul style="list-style-type: none"> <li>i. The project is accepted and locals are optimistic about it</li> <li>ii. There is a request to drill more wells for the community or dam as part of CSR</li> <li>iii. The project should leave something behind to the affected community as remembrance, such as wells, dams and so on</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will make sure to prioritize locals for employment opportunities</li> </ul>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>iv. The project should offer employment opportunities to locals, including women and youth</li> <li>v. The project should provide compensations to project affected persons so that they can search for new areas early on and continue with their agricultural activities</li> <li>vi. Contracts should be provided to all project employees</li> <li>vii. The project should ensure employees are not hired through favoritism and corruption but through fairness, and locals should be prioritized</li> </ul>	
	VDC	Kalemela village	<ul style="list-style-type: none"> <li>i. The project should leave something as a remembrance to the community, like a well for the community to get water</li> <li>ii. The project should consider putting moderate ticket rates during operation, so that transportation can be affordable to the majority</li> <li>iii. The project should consider skill more than certification when hiring employees</li> <li>iv. The project should provide employment opportunities to locals</li> <li>v. Locals need to know how long the project will take to be complete</li> <li>vi. Camp sites should adhere to health regulations to prevent spread of diseases</li> <li>vii. Locals are requesting project to develop their primary schools Ugwigwa and maendeleo</li> <li>viii. The project should improve their payment system, especially in payment of allowances whenever they have meetings with village/ward leaders</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will ensure health regulations to prevent spread of disease.</li> <li>ii. The proponent will ensure to provide employment opportunities to local's community.</li> </ul>
A				
James Mkumbo	District Commissioner's office	District Administrative Secretary - DAS	<ul style="list-style-type: none"> <li>i. The SGR will bring about development to Kigoma region because the biggest challenge is transportation</li> <li>ii. Cultural integration will help reduce cases of child labour, early marriage and patriotism because people will learn civilization from the cultural intergarion.</li> <li>iii. To earmark all the areas with grave yards</li> <li>iv. Cultural integration can cause intermarriage</li> <li>v. Possible job opportunities such as casual labourers</li> <li>vi. Increase in business opportunities such as food vendors</li> </ul>	The proponent will work on the issues raised
ainab Mbunda	Uvinza District Council	District Executive	<ul style="list-style-type: none"> <li>i. There will be economic growth among the community members. They will be able to interact with the border in Congo, Burundi and grow the business.</li> </ul>	The proponent will work on the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
		Officer – DED	<ul style="list-style-type: none"> <li>ii. The community members will also have opportunities to build go downs so as to store their goods.</li> <li>iii. There will be growth in population</li> <li>iv. Cultural disruption which will lead to babies with mixed race and also people will get more exposure and change their past old fashioned believes</li> <li>v. Likely to cause environmental pollution therefore the proponent should make sure they plant trees that will sustain the conditions.</li> <li>vi. Dust that can bring about diseases</li> <li>vii. Destruction of the natural layout such as rivers</li> </ul>	
Mussein Matelanyo	Uvinza District Council	District Environmental management officer - DEMO	<ul style="list-style-type: none"> <li>i. Destruction of housing and settlements. The proponent should look into compensating the people</li> <li>ii. Loss of bio diversity</li> <li>iii. Attract more job opportunities in the project area</li> <li>iv. Easy transport of people and crops</li> <li>v. The project should consider the issues of water and sanitation since there will be population influx</li> <li>vi. They should create more boreholes that will also be beneficial to the proponent activities</li> <li>vii. Water supply is still a problem in Uvinza district and only 35% of the health facilities have water supply.</li> <li>viii. The government system should look for ways to make the proponent adhere to the advice given.</li> <li>ix. The integration of people can increase prostitution activities</li> <li>x. Possible increase in HIV and Hepatitis B cases</li> <li>xi. To practice aforestation in the areas where they will cut off trees.</li> <li>xii. The construction activities will disturb the natural soil and cause erosion.</li> <li>xiii. Pollution of Malagarasi and Lugufu Rivers</li> <li>xiv. There is a wetland in Malagarasi ward, Mlia Bibi village therefore the infrastructure must adhere to that.</li> <li>xv. Waste production such as liquid wastes, chemicals and solid wastes. The proponent should build a stabilization pond for solid wastes.</li> <li>xvi.</li> </ul>	The proponent will work on the issues raised
Muniphace Matete	Uvinza District Council	Ag. District Community Development Officer - DCDO	<ul style="list-style-type: none"> <li>i. There will be an increase in employment opportunities</li> <li>ii. The transport will be made easy</li> <li>iii. Growth of various tourism spots. They have Mahale Mountains, Malagarasi River and forests</li> <li>iv. Possible cases for gender based violence because a lot of men do not like women to participate in employment opportunities</li> <li>v. There is a possibility of discrimination in the employment opportunities were most of these opportunities are provided to men rather than women.</li> </ul>	The proponent will work on the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>vi. There might be an increase in diseases because the proponent has set their camp at Ruchugi village. There is a possibility of increase in HIV/AIDS and sexually transmitted diseases.</li> <li>vii. Increase in theft because there will be limited opportunities caused by population influx</li> <li>viii. Destruction of culture and norms</li> <li>ix. Possible increase in street children that will be left behind when the project activities phases out.</li> <li>x. Possible increase in child labour cases</li> <li>xi. The proponent should invest in providing frequent education in the community.</li> <li>xii. The proponent should prioritize the natives to increase sense of ownership</li> </ul>	
orian Cheusi	Uvinza District Council	District Agricultural Officer - DACCa	<ul style="list-style-type: none"> <li>i. Reduction of the farming land therefore the proponent should pay compensation to the farmers after they confiscate their land</li> <li>ii. To have market area as a stop center since we practice tobacco, cotton and palm tree farming activities</li> <li>iii. The wetland area is supposed to be reserved. They should welcome a project that will not affect the environment.</li> <li>iv. They cannot prohibit such a project but the proponent should look from ways to compensate the affected parties.</li> </ul>	The proponent will work on the issues raised
elix yaulingo	Uvinza District Council	District Planning Officer - DPLO	<ul style="list-style-type: none"> <li>v. The project will attract job opportunities of the skilled and unskilled labour</li> <li>vi. The proponent should adhere to the social responsibility</li> </ul>	The proponent will work on the issues raised
eland ambili	Uvinza District Council	District Human Resource Management Officer - DAHRMO	<ul style="list-style-type: none"> <li>i. The project is good because people will stop depending in farming activities as a single source of income.</li> <li>ii. There will be an increase in food security because people will get into business and stop farming activities therefore I advice to have education programs</li> <li>iii. Uvinza district has lot of grazing areas that the livestock keepers use.</li> <li>iv. All the villages have land use plan but it is not updated.</li> <li>v. They ask for a copy of the report in their office after finishing the ESIA activity</li> <li>vi. The municipal has enough experts to be involved in the project such as community development officer and environmental officer.</li> </ul>	The proponent will work on the issues raised
aniel alabam	Uvinza District Council	District Forestry and Tourism Officer	<ul style="list-style-type: none"> <li>i. There some forest reserves in the proposed route such as; <ul style="list-style-type: none"> <li>➤ Ilunde forest reserve</li> <li>➤ Masanza forest</li> <li>➤ Kandaga forest</li> </ul> </li> </ul>	The proponent will work on the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>➤ Malagarasi wetlands were one side of it is the village area and the other side is the village ranch area. The railway passes an area that is proposed for livestock crossing.</li> <li>ii. There is also a forest reserve area from Masanza to Kazulamimba</li> <li>iii. The railway will affect the animal passage</li> <li>iv. There people practicing bee keeping in the forest areas therefore having the SGR will increase the market for products such as honey</li> </ul>	
Amwel Yagala	Uvinza District Council	District Livestock officer	<ul style="list-style-type: none"> <li>i. The community in Uvinza practices free range grazing of livestock. The SGR can reduce the livestock keeping activities (cattle, goats, and sheep)</li> <li>ii. There will be an increase in the demand of protein foods due to population influx that will come about due to the construction activities.</li> <li>iii. They have a land use plan that will be affected by SGR.</li> <li>iv. They have not started carbon projects but SGR will reduce the possible sites for carbon investment. Therefore the proponent should have a rehabilitation plan.</li> <li>v. For the case of compensation, they would advice to compensate the community in form of palm trees or trees that can be used for wood and not fruit trees.</li> </ul>	The proponent will work on the issues raised
Justin Kapama	Uvinza District Council	District Bee keeping officer	<ul style="list-style-type: none"> <li>i. The SGR crosses in the forest area which will affect the natural vegetation and bee keeping activities</li> <li>ii. Chemical spills can take place on the railway sides and affect the food for the bees and later own affect the honey.</li> <li>iii. The chemical spillage can be a source of pests which cause diseases to the bees.</li> <li>iv. There is a possibility of getting invasive species during the construction activities</li> <li>v. The community will sell honey if there will be stations.</li> </ul>	The proponent will work on the issues raised
Angu M. Sanford	Uvinza District Council	District TASAF officer	<ul style="list-style-type: none"> <li>i. The elderly, youth, women are more likely to experience Gender Based Violence</li> <li>ii. Possible risk of HIV because of integration of people from different backgrounds and culture</li> <li>iii. There primary schools in these sites so the students are more likely to get into bad behavior and hooliganism.</li> <li>iv. Abrupt cultural change and bad behavior such as clothing, intermarriage and theft.</li> </ul>	The proponent will work on the issues raised
Ang. Shilungu Mijja	Tanzania Rural and Urban Roads agency - TARURA	Uvinza District Manager	<ul style="list-style-type: none"> <li>i. The proponent should continue with the construction activities but adhere to the roads that are under TARURA. They should put a bridge crocking over or under the roads</li> </ul>	The proponent will work on the issues raised



Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>ii. They have seen the proposed map for the SGR and think that the railway is crossing far from the roads that are under TARURA but they can destroy the bridges.</li> <li>iii. We advice the proponent to set a plan for building bridges in any road crossing.</li> <li>iv. Positive impact includes improvement in transportation of human beings and livestock</li> <li>v. They will be able to link the roads</li> <li>vi. There is a permit in that the proponent has to acquire when damages are made to the roads.</li> </ul>	
Leusdedith Makaga	Tanzania Electric Supply Company-TANESCO	Uvinza District Manager	<ul style="list-style-type: none"> <li>i. TANESCO will be involved in moving the electric lines and grids.</li> <li>ii. TRC should consult TANESCO and show them the grid points for them to conduct a survey and approximated cost for the moving exercise. They will send the cost to TRC for them to facilitate TANESCO in the activity</li> <li>iii. TANESCO has lines across many villages that mean the proponent will have to move the line during AGR construction activities. That means the people will not get electricity for some time until the lines are moved and situated somewhere else.</li> <li>iv. During the moving exercise, TANESCO will not get income due to power cut.</li> <li>v. When the TANESCO lines are tempered then the proponent will have to pay the fines or TRC</li> <li>vi. TANESCO insisted that they should know the points earlier because when delayed then the proponents work will also delay.</li> <li>vii. In case of Grid, the proponent is allowed to start construction from a distance of 30 meters and 5 meters from the line.</li> </ul>	The proponent will comply with the issues raised
Amilia S. Mulinsiye	Rural Water Supply and Sanitation Agency - RUWASA	Uvinza District Manager	<ul style="list-style-type: none"> <li>i. There is a water project from Nguruka to Kalenge, Kazulamimba therefore the construction activities can cause destruction in these infrastructure</li> <li>ii. The proponent should have a rehabilitation plan after damaging the water sources.</li> <li>iii. When the water infrastructure is destroyed then they should involve RUWASA and the community around the area.</li> <li>iv. The proponent should consult RUWASA when they come across their infrastructure for possible shifting earlier before the community faces challenges of lacking water.</li> </ul>	The proponent will comply with the raised concerns
Joseph Magiki	Fire And Rescue Force	Uvinza District Manager	<ul style="list-style-type: none"> <li>v. The project will bring about resettlement of people's residence</li> <li>vi. Occurrence of diseases</li> </ul>	The proponent will comply with the raised concerns

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>vii. Destruction of forests by deforestation or with lighting fire</li> <li>viii. The proponent should plant trees by involving the community members</li> <li>ix. The community members of Kigoma like to light fire in the forests there it is advisable that the proponent should have a fire brake</li> <li>x. The project will destroy the animal passage which will pose a challenge to the livestock keepers</li> <li>xi. The proponent should have a fence to limit the movement of the animals</li> <li>xii. The project should involve OSHA when constructing roads and buildings so as to take safety measures.</li> </ul>	
William S. koi	Tanzania Forestry Agency - TFS	Uvinza District Manager	<ul style="list-style-type: none"> <li>i. The proposed area has a seasonal river called Masanza and also river Ruchugi</li> <li>ii. Destruction of the ecology</li> <li>iii. The railway will divide the forest area which will attract people who will trespass into the forest area.</li> <li>iv. When the railway crosses the forest area, it will attract poachers and encroachment activities</li> <li>v. Most of the forests do not have animals because there trespassers who have invaded the forest area.</li> <li>vi. The proponent should give the youths employment opportunities so they can The proponent should comply with the laws and regulations of the forest reserves and they should work together stop cutting down trees for charcoal</li> <li>vii. with staffs at TFS.</li> <li>viii. When doing the SGR construction, the proponent should consider the water sources</li> <li>ix. To have a ranger post in Lugufu village due to illegal migrants who have invaded the village and might pose a challenge in the project proceedings</li> <li>x. Possible invasive species</li> </ul>	The proponent will comply with the raised concerns
DC	Nguruka ward	Nyangabo-Buli la Ngombe hamlet	<ul style="list-style-type: none"> <li>i. They are very happy to receive the railway because they will reach Dar es Salaam quickly using a short time.</li> <li>ii. The proponent should take note of the farms that can be destroyed due to the construction activities</li> <li>iii. The massive holes that will be left behind should be filled and not left open to avoid accidents and breeding sites for mosquitoes when filled with water</li> <li>iv. To be compensated when the proponent confiscate their land and farms were they practice tobacco farming</li> <li>v. The biggest issue is building flyovers to allow people to cross easily to the other side.</li> <li>vi. To have a training station in the village area</li> <li>vii. To have safety signs during and after the construction of the SGR</li> </ul>	The proponent will comply with all the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			viii. To help them with bore hole construction that will benefit the whole village.	
DC	Mganza ward	Malagarasi (Mlia Bibi)	<ul style="list-style-type: none"> <li>i. The project cross cuts in the farms that belong to the community members so the proponent should prepare compensation means</li> <li>ii. They should build small stations in the village area</li> <li>iii. To build flyovers since the railway will divide their lands</li> <li>iv. The compensation process should not be delayed</li> <li>v. They Youth should get job opportunities</li> <li>vi. When the proponent reaches a grave yard area, they should consult the village leaders before proceeding</li> <li>vii. It will simply transport services because from Kigoma to Dar es salaam will only take a day</li> <li>viii. They should build camps with sustainable buildings which can be used as classrooms in the future</li> <li>ix. The cultural integration will cause intermarriage</li> <li>x. To improve security in the village area and if possible to get a police station due to integration of people.</li> <li>xi. Avoid corruption when the community members go to ask for employment opportunities</li> </ul>	The proponent will comply with the issues raised
DC	Mganza ward	Mpeta	<ul style="list-style-type: none"> <li>i. Improvement of the transport services in the Village and the transport cost will be affordable</li> <li>ii. Employment opportunities will be available and they know the youth will be prioritized</li> <li>iii. To have a rehabilitation plan of filling the holes that are left behind after decommission</li> <li>iv. Population influx but it is a good thing to them because they are already used to the integration of various people from other projects.</li> <li>v. Construction of the pass ways across the railway</li> <li>vi. Reforestation in the areas where trees will be chopped down</li> <li>vii. Employment Opportunities should be Prioritized to the local residents</li> <li>viii. Corruption should not be allowed in the employment opportunities</li> <li>ix. Air pollution caused by dust which will cause a lot of people to suffer from Tuberculosis</li> <li>x. After the partial demobilization, the proponent should hand over the buildings that they used as camps and other facilities that they have constructed such as bore holes, health facilities and other social services.</li> <li>xi. The proponent should avoid discrimination when offering job opportunities.</li> <li>xii. Compensation to the PAPs should be done before the project Commences</li> </ul>	The proponent will comply with the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>xiii. Economic growth because people will do business such as selling tea and food vending</li> <li>xiv. The PAPs should be compensated by considering the actual value of the lost property</li> <li>xv. Awareness program on prevention of spread of HIV/AIDS should be launched.</li> <li>xvi. The proponents should construct gravel roads so as to use them when transporting equipments and these roads should have road bumps to avoid accidents.</li> <li>xvii. Hamlets resident should be given education on safety adherence when using the SGR</li> <li>xviii. Prioritize social capital</li> <li>xix. The proponent should build a camp in Mpetu village so as to create opportunities for food vendors and attract more investment in lodging and housing.</li> <li>xx. The proponent should consider building a health facility because they only have a dispensary which is insufficient.</li> <li>xxi. There might be presence of Gender violence cases to the women and children due to cultural integration. They should use experts from social welfare office to report such cases.</li> <li>xxii. The project can destroy the village forest reserve area.</li> </ul>	
DC	Uvinza	Ilunde	<ul style="list-style-type: none"> <li>i. The proponent should pay compensation when they confiscate the farms and land.</li> <li>ii. A lot of people in this area are livestock keepers therefore they ask to have a flyover to be able to cross from one side to another when looking for pasture.</li> <li>iii. The project will bring employment opportunities to the people in this area especially the youth who can become drivers</li> <li>iv. The proponent should improve the roads because they will also be using them</li> <li>v. The proponent should adhere to CSR regulations</li> <li>vi. To avoid discrimination during the recruitment process</li> <li>vii. The women should be prioritized in the employment opportunities and the working criteria should be open without any kind of biasness or discrimination</li> <li>viii. Dust that can be mitigated by pouring water on the roads frequently</li> <li>ix. Possible vibrations caused by bursting of the rocks for construction activities. The stones can also travel very far and cause harm to the community members</li> <li>x. Growth of business such as food vendors</li> <li>xi. The integration of people can lead to HIV infection therefore the proponent should initiate education programs</li> <li>xii. To get railway stations</li> </ul>	The proponent will comply with all the issues raised

Stakeholder Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			xiii. The Cooperate Social Responsibility should include building of teachers houses and secondary schools	
DC	Uvinza	Tandala	<ul style="list-style-type: none"> <li>i. The project is good because it will simplify transportation services whereas the travel time from Kigoma to Dar it will only be 9 hours.</li> <li>ii. The project will affect farming activities were the people in this area practice Rice, Sunflower, Trees and Maize farming.</li> <li>iii. The report after land validation should reflect the current market price</li> <li>iv. Such projects leave behind dust which cause diseases such as difficulty in breathing and cough</li> <li>v. The Cooperate Social Responsibility should be inclusive of the vulnerable groups such as people living with disability</li> <li>vi. Growth in economy whereas the women will sell milk,</li> <li>vii. The proponent should put safety signs in the construction site and also permanent signs when the SGR starts to operate</li> <li>viii. Moral decay due to integration of people from different cultural backgrounds such as thieves and robbers and prostitutes. Therefore the visitors should respect the cultural believes that they find in the community.</li> <li>ix. Family separation due to integration of people from different backgrounds.</li> <li>x. The proponent should construct a flyover and underpass in the village area.</li> <li>xi. Increase in market value to the goods and commodities</li> <li>xii. The children will be more at risk if the proponent doesn't build a fence.</li> <li>xiii. Noise pollution that will be caused by the construction activities</li> <li>xiv. Air pollution that can be caused by smoke from the machines that will be using in construction that can lead to diseases such as difficulty in breathing.</li> <li>xv. Environmental pollution that can be caused by destruction of land by leaving behind massive holes</li> <li>xvi. The fuel from the cars can pollute the water sources and the natural outlook.</li> <li>xvii. Cultural change especially in clothing</li> <li>xviii. Attract business and investors who can invest in crops and livestock</li> <li>xix. They are requesting to have a station in the village area</li> </ul>	The proponent will comply with the issues raised
DC	Uvinza	Chakulu	<ul style="list-style-type: none"> <li>i. Destruction of many plants including Mango trees</li> <li>ii. They suggested that the railway should have a fence during operation to avoid accidents</li> </ul>	The proponent will comply with all the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>iii. Compensation should be done according to the value of the land or farm that will be confiscated</li> <li>iv. The project has crossed in cotton farms and other forests that are used for firewood and honey. The project will reduce some individual's income</li> <li>v. The project will help to transport animals and crops</li> <li>vi. Possible employment opportunities for youth such as casual labourers and they should not be in form of discrimination</li> <li>vii. They have looked after the forest reserve and they get rain and firewood. The proponent should compensate the village government in case of any damage to the forest.</li> <li>viii. There is an area in the village forest reserve that they use for rituals. The proponent should compensate the village and consult the village government in case they want to use that area.</li> <li>ix. Easy transport from Dar es Salaam to Kigoma</li> <li>x. It will help to grow business in the area and they ask the proponent to support them in building a market area.</li> <li>xi. There will be an increase in population</li> <li>xii. They will get water due to construction of bore holes</li> <li>xiii. Dust</li> <li>xiv. Possible cases of HIV/ AIDS</li> <li>xv. Abruption of diseases such as Hepatitis B so the proponent should support us will medical supplies in our health facilities</li> <li>xvi. Increase in money services such as banks due to integration of people</li> <li>xvii. The proponent should support us in building a police station to increase security due to population influx.</li> <li>xviii. There will be an increase in land value</li> <li>xix. The change in culture due to integration of people</li> </ul>	
DC	Uvinza	Ruchugi village	<ul style="list-style-type: none"> <li>i. Improvement of the transport services in the Village</li> <li>ii. Construction of flyovers when they reach the village</li> <li>iii. Reforestation in the areas that will undergo deforestation</li> <li>iv. Employment opportunities should be prioritized to the local residents</li> <li>v. Corruption should not be allowed in employment opportunities</li> <li>vi. Compensation to the PAPs should be done before the project Commences</li> <li>vii. The PAPs should be compensated by considering the actual value of the lost property</li> <li>viii. Awareness Program on Prevention of spread of HIV/AIDS should be launched.</li> <li>ix. Hamlets resident should be given education on how to behave when using the SGR</li> <li>x. Development of water facilities</li> <li>xi. Improvement of Health Facilities</li> </ul>	The proponent will comply with the raised issues

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>xii. Destruction of the main source of water at the village called Ruchugi water source used by many of the residents. They also have Boreholes such as; Kazaroho and springs like Masanza, also the area gets water from RUWASA 4hrs twice per week.</li> <li>xiii. Employment opportunities</li> <li>xiv. Improvement of Social Services</li> <li>xv. Construction of housing areas for the teachers</li> <li>xvi. Improvement of transport facilities</li> <li>xvii. Improvement of Social Economic Conditions of the Village</li> <li>xviii. Fairly Compensation of the lost property according to the Market price</li> <li>xix. Increase of street Children due to intermarriage</li> <li>xx. Relocation of the people's residence</li> <li>xxi. Employment opportunities will be created by the project</li> <li>xxii. Moral deterioration and cultural instability</li> <li>xxiii. Spread of Diseases</li> <li>xxiv. Family separation</li> <li>xxv. Accidents</li> <li>xxvi. Air pollution caused by Dust</li> <li>xxvii. Destruction of historical site at Boma la Mjerumani</li> <li>xxviii. Loss of Biodiversity</li> <li>xxix. Disappearance of sources of water</li> <li>xxx. Soil erosion</li> </ul>	
DC	Uvinza	Lugufu	<ul style="list-style-type: none"> <li>i. This area is under Tanzania Investment Chamber – TIC there is no village government and the people who reside there are illegal migrants.</li> </ul>	This stakeholder
DC	Kandaga	Kalenge	<ul style="list-style-type: none"> <li>i. They ask to be compensated in terms of money for everyone whose land will be confiscated.</li> <li>ii. The youth to get employment opportunities</li> <li>iii. They should build flyovers for the people to manage to go to the farms on the other side and also for the people and animals to cross to the other side.</li> <li>iv. The compensation should equal to the value of the property</li> <li>v. The proponent should be aware of the water sources such as River Kalenge, River Nyamponda, River Ngudwe, River Mkangule, River Nyamasato, river Burangamila where the community uses these sources for domestic use and feeding the livestock.</li> <li>vi. When the proponent confiscates a farm, then they should compensate for everything in the farm from the trees with fruits and palm trees,</li> <li>vii. They ask the proponent to provide a station to help the students who are studying in Kalenge Secondary school but they leave outside Kigoma region</li> </ul>	The proponent will comply with the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>viii. They are very grateful for involving the community from the early stage</li> <li>ix. Kalenge has two major roads that link all the villages therefore the proponent should find a way of not destroying them.</li> <li>x. When the proponent starts the construction activities, they ask to get the mobile toilets or build toilets due to population influx.</li> <li>xi. The women asked for job opportunities also because they believe they are capable to work as casual labourers in uprooting trees, slashing, weeding and move trees.</li> <li>xii. Employment opportunities for the youth and to not set high qualifications such as having an identification card from NIDA.</li> <li>xiii. The proponent should help the widows and people leaving with disability by providing iron sheets</li> <li>xiv. To initiate groups that will be used to provide education in the community.</li> <li>xv. During operation, the train should reduce speed when passing at a village area or have traffic police in these areas.</li> <li>xvi. Easy means of transport</li> <li>xvii. The proponent should be aware of the grave yards when doing the construction activities.</li> <li>xviii. There also forests for individuals that the proponent should be aware of.</li> </ul>	
DC	Kandaga	Kandaga	<ul style="list-style-type: none"> <li>i. They have received the project well and they are asking to get a railway station at their village.</li> <li>ii. Noise pollution caused by vibration of the train when it starts operating</li> <li>iii. To ensure that the compensation is the same as the value of the property that is been damaged.</li> <li>iv. Loss agricultural land</li> <li>v. Employment opportunities to the youth and even the elderly such as casual labourers and security. These positions should be advertised through the village government</li> <li>vi. The women were asking for opportunities to become food vendors</li> <li>vii. Increase of income and standard of living</li> <li>viii. Compensation should reflect the current market value</li> <li>ix. To have a bridge that will be used by humans and livestock to the other side.</li> <li>x. Possible noise pollution caused by the use of heavy machinery</li> <li>xi. Vibration cause harm to different people in the community so the proponent should take measures of providing health services.</li> </ul>	The proponent will comply will all the issues raised



Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>xii. The forests are important to them because they hope to harvest carbon credit and also they generate income from the forests. Therefore they should ensure provision of replaced forest land so as they can perform carbon credit.</li> <li>xiii. The proponent should let people know if they can continue with farming activities in the areas that have been marked as possible sited for railway construction.</li> <li>xiv. There should be a procedure of paying compensation in form of pension and compensation.</li> <li>xv. Improvement of transportation of crops and people from Kigoma to Dar es salaam</li> <li>xvi. Provision of education on how to prevent accidents, spread of HIV/AIDS, and sexual harassments.</li> </ul>	
DC	Kazulamimba	Kazulamimba	<ul style="list-style-type: none"> <li>i. To prioritize employment opportunities to locals</li> <li>ii. To leave something behind to the community as remembrance, such as wells, dams and hospital</li> <li>iii. Provision of education on how to prevent accidents, spread of HIV/AIDS, and sexual harassments.</li> <li>iv. Conduction of reforestation program.</li> <li>v. Corruption in employment opportunity should be avoided.</li> <li>vi. Ensure all water sources such as rivers are not contaminated or blocked</li> <li>vii. Ensure to adhere to cultural and norms during relocation of graves</li> <li>viii. Employment opportunities.</li> <li>ix. Improved transportation facilities.</li> <li>x. Improved health services.</li> <li>xi. Being compensated on time and fairly according to the current market price.</li> <li>xii. Establishment of train station</li> <li>xiii. Construction of bridge for livestock and people to cross through</li> </ul>	The proponent will comply with all the issues raised
DC	Kazulamimba	Mwamila	<ul style="list-style-type: none"> <li>i. To get job opportunities</li> <li>ii. Possible increase in sexually transmitted diseases and HIV/AIDS</li> <li>iii. Destruction of houses therefore the people should be compensated so they can move and build someplace else.</li> <li>iv. The graves should be compensated when they want to confiscate that land.</li> <li>v. Practice reforestation after decommission phase</li> <li>vi. There water projects in the community so when the project destroys the water sources then they should do restoration</li> </ul>	The proponent will comply with all the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>vii. There is a village forest reserve in Tobila. If the proponent tempers with the forest then the compensation should be paid to the village government.</li> <li>viii. They should have one bridge</li> <li>ix. They should fill all the holes they leave behind after taking sand or soil they should also have a rehabilitation plan which will include afforestation</li> <li>x. They advice that SGR project should move to Mguti forest because their village is small.</li> <li>xi. Growth of the economy where the food vendors will sell food, salt, sugarcane and other businesses.</li> <li>xii. There will be an increase in crime because of integration of people from different areas.</li> <li>xiii. There will be demoralization and family separation</li> <li>xiv. Increase in investment spots such as hotels and lodging</li> <li>xv. The farmers will use SGR to transport crops and livestock</li> <li>xvi. To have bridges so as to avoid accidents especially to children</li> <li>xvii. To have education programs on HIV/AIDS and also get condoms and HIV test kits as means of protection</li> <li>xviii. After the project phases out, the proponent should hand over the buildings of their camp sites to be used as classrooms</li> <li>xix. Possible accidents at the project site therefore they should increase medical equipment at the dispensary</li> </ul>	
DC	Nguruka	Bweru	<ul style="list-style-type: none"> <li>i. Relocation of settlements</li> <li>ii. Loss agricultural land</li> <li>iii. Employment opportunities</li> <li>iv. Increase of income and standard of living</li> <li>v. Growth of business</li> <li>vi. Loss of biodiversity.</li> <li>vii. Deforestation.</li> <li>viii. Employment opportunities</li> <li>ix. Improved transportation facilities</li> <li>x. Improved health services</li> <li>xi. Being compensated on time and fairly according to the current market price.</li> <li>xii. To prioritize employment opportunities to locals</li> <li>xiii. To leave something behind to the community as remembrance, such as wells, dams and hospital</li> <li>xiv. Provision of education on how to prevent accidents, spread of HIV/AIDS, and sexual harassments.</li> <li>xv. Conduction of reforestation program.</li> <li>xvi. Corruption in employment opportunity should be avoided.</li> <li>xvii. Ensure land is restored where there will be sand mining (sand pits).</li> </ul>	The proponent will comply with all the issues raised

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
DC	Nguruka	Reli mpya	<ul style="list-style-type: none"> <li>i. Increase of employment opportunities</li> <li>ii. Improvement of Social Services</li> <li>iii. Improvement of transport facilities</li> <li>iv. Donation from the project (CSR)</li> <li>v. Improvement of Social Economic Conditions of the Hamlet</li> <li>vi. Employment Opportunities should be Prioritized to the local residents</li> <li>vii. Corruption should not be allowed in employment opportunities</li> <li>viii. The project should leave something in the Community like dams, wells, Health facilities, or any other social service facilities as the remembrance after the completion of the project.</li> <li>ix. Compensation to the PAPs should be done before the project Commences</li> <li>x. The PAPs should be compensated by considering the actual value of the lost property</li> <li>xi. Awareness Program on Prevention of spread of HIV/AIDS should be launched.</li> <li>xii. Hamlets resident should be given education on how to behave when using the SGR</li> </ul>	The proponent will comply with all the issues raised
A				
r.RashidChua ua	District Commissioner (DC)		<ul style="list-style-type: none"> <li>i. The project is accepted positively.</li> <li>ii. Private companies should be allowed to use Rail way infrastructures so as they have the opportunity to operate private trains under TRC guidance.</li> <li>iii. Awareness should be provided to the community based on sexual harassment and sexual diseases.</li> <li>iv. Increase of Economic growth and reduce the cost of living.</li> </ul>	The proponent will take into consideration on the all issues raised by the stakeholders.
amisi S. atabanya	ISAWIMA		<ul style="list-style-type: none"> <li>i. A proponent should cut trees as per required space for the implementation of the project.</li> <li>ii. There should no throwing of poisonous materials in the protected areas (national parks, game reserves) during project operation.</li> <li>iii. During construction, they are not allowed to hunt and kill the animals in protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>i. A proponent will ensure only trees in the covered area are cut for the implementation.</li> <li>ii. The Proponent will insure proper management of waste.</li> <li>iii. Animals in protected areas will neither be hunted nor killed.</li> </ul>
lphonece ohnson	TFS		<ul style="list-style-type: none"> <li>i. Cutting trees will affect bees keeping and affect rainfall trends which will lead to climate change; therefore, there should be planting of the new trees to compensate the lost ones.</li> <li>ii. Trees should be cut according to the need of the area to be covered by the project.</li> <li>iii. For the trees that will be cut will be sold and used for</li> </ul>	<ul style="list-style-type: none"> <li>i. A proponent will ensure only trees in the covered area are cut for the implementation.</li> <li>ii. A proponent will take into consideration on the all issues raised by the</li> </ul>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			other different purposes such as making charcoal, used as firewood, timber processing etc.; hence it will increase the District's revenue.	stakeholders.
PCI SE. dyanabi CII DJ. araka	TAWA		<ul style="list-style-type: none"> <li>i. Foreign contractors will increase interaction and will help to promote our country to increase tourists henceforth will increase the national revenue.</li> <li>ii. A proponent should avoid water, air and soil pollution to prevent the negative impacts to biodiversity which might lead to their loss.</li> <li>iii. Habituation will lead into eruption of zoonotic diseases.</li> <li>iv. The project's construction should be in consultation with the respective personnel in the protected areas to be provided with cautions and awareness related to those areas. They must construct under their supervision.</li> <li>v. A proponent should consider pathways for the animals to pass either one or two points.</li> <li>vi. The guidance should be provided to contractors and community surrounding the protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will take into consideration on the all issues raised by the stakeholders.</li> </ul>
ng. Jalia risa	TARURA		<ul style="list-style-type: none"> <li>i. There should be safety signs in special areas such as schools, hospitals, colleges, protected areas, pathways etc.</li> <li>ii. Awareness should be provided to the community on management of railway infrastructures to prevent damage.</li> </ul>	<ul style="list-style-type: none"> <li>i. Safety signs will be placed in all strategic areas</li> <li>ii. Awareness will be provided to community on proper management of railway infrastructures</li> </ul>
odfrey Ivester laganga	Fire And Rescue Force		<ul style="list-style-type: none"> <li>i. The implementation of the project will increase revenue through trainings and fees for registration of new premises.</li> <li>ii. During operation, Fire and Rescue Force should be involved to provide safety awareness and cautions to deal with fire disasters when they arise.</li> <li>iii. For the sites that will be covered by the project and camps should be identified, measured and established then a proponent should ensure that the fire marshal are there and fire protection equipment are installed and serviced on time.</li> </ul>	<ul style="list-style-type: none"> <li>i. The proponent will be registered by Fire and all the issues raised by stakeholders will be taken into consideration</li> </ul>
efonce Arthur	TANESCO		<ul style="list-style-type: none"> <li>i. As the suppliers, TANESCO is ready to serve the project since they are planning to have a special line for Standard Gauge Railway (SGR) to ensure the availability of electricity. Also for the existing infrastructures which have to be removed for the project implementation should be identified for the reallocation to prevent lack of services in the relevant areas.</li> <li>ii. Consultation on new connections at any component of the project should be done earlier so as to be served on time.</li> <li>iii. The implementation of the project will increase the large customers to their organization as the project will involve the high consumption of electricity in its operation. Henceforth increase in revenue.</li> </ul>	The proponent will take into consideration on the all issues raised by the stakeholders.

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
Emmanuel R. Mshambo	DEPARTMENT OF PLANNING		<ul style="list-style-type: none"> <li>i. They have received and accepted the project with a positive attitude since will beautify the District and will act as a catalyst to employment and other opportunities hence will lead to economic growth.</li> <li>ii. The proponent should ensure that for the displaced houses, land, farms etc., should be compensated as per their value and on time.</li> <li>iii. The project coverage should consider the rituals and cemeteries areas.</li> </ul>	
Abala Lukonda	COMMUNITY DEVELOPMENT DEPARTMENT		<ul style="list-style-type: none"> <li>i. Displacement of land, houses and farms that will lead to disturbances in the community.</li> <li>ii. Compensation should be relevant to what will be lost.</li> <li>iii. The proponent should construct the permanent camps so that to be used by the community for other social activities after completion of the project.</li> <li>iv. Moral degradation due to increase of social interactions within the community.</li> <li>v. Local materials should be purchased in the same community depending on its availability.</li> <li>vi. Employment opportunities should be prioritized to the local community.</li> </ul>	<ul style="list-style-type: none"> <li>vii. The client will ensure compensation is done fairly.</li> <li>viii. The proponent will take action of all concerns that has been raised by the stakeholders.</li> </ul>
Ericson A. Mbatwa	ENVIRONMENTAL DEPARTMENT		<ul style="list-style-type: none"> <li>i. Bore pits should be covered after construction activities.</li> <li>ii. The Proponent should ensure proper management of solid and liquid wastes during construction and operation phases.</li> <li>iii. The Proponent should consider safety issues during construction and operation phases.</li> <li>iv. There should be proper management of hazardous waste such as scrap metals that should be collected by authorized collectors or contractors registered by NEMC.</li> <li>v. There should be reforestation for the areas where there was displacement of trees.</li> <li>vi. Construction activities should be conducted during the day and not night hours to avoid disturbances to the surrounding communities.</li> <li>vii. There should be proper management of dust, noise to avoid pollution.</li> </ul>	<ul style="list-style-type: none"> <li>viii. A proponent will ensure that, the solid wastes and onsite waste water treatment facilities are in good condition and water right is obtained.</li> <li>ix. Bore pits will be covered after construction is done.</li> <li>x. The proponent will adhere to all safety and occupational health issues during construction and operation phase.</li> </ul>
Eng. Mwapambano M.	RUWASA		<ul style="list-style-type: none"> <li>i. There should consultation during construction between clients and RUWASA to avoid destruction of existing water infrastructures.</li> <li>ii. The implementation of the project will increase number of customers to their organization due to an increase of interaction in the community. Henceforth increase in revenue.</li> <li>iii. The project is accepted.</li> </ul>	<ul style="list-style-type: none"> <li>iv. The client is committed to consult RUWASA as one of its stakeholders during construction</li> </ul>

Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
Ennet B. amara	Natural Resources and Environmental Management Department		<ul style="list-style-type: none"> <li>i. During construction, they are not allowed to hunt and kill the animals in protected areas.</li> <li>ii. There should be no random disposal of waste to avoid animal exposure.</li> <li>iii. Trees should be cut according to the need of the area to be covered by the project.</li> </ul>	<ul style="list-style-type: none"> <li>iv. Animals in protected areas will neither be hunted nor killed</li> <li>v. The proponent will ensure proper management of solid waste in all project phases.</li> <li>vi. The proponent will ensure only trees in the covered area are cut for the implementation</li> </ul>
ovitus C. amugisha	Land Planning Department		<ul style="list-style-type: none"> <li>i. Increase in land value.</li> <li>ii. The project will lead to increase in number of surveyed and planned plots.</li> <li>iii. The proponent should ensure that for the displaced houses, land, farms etc., should be compensated as per their value and on time.</li> <li>iv. The project will lead to an increase in number of land use planning villages and people with title deed.</li> <li>v. The city will grow especially in stations areas.</li> </ul>	The proponent will take action of all concerns that has been raised by the stakeholders.
Dr. Mirambo Gibson	Agricultural Department		<ul style="list-style-type: none"> <li>i. The proponent should consider pathways for the livestock and people to pass either one or two points.</li> <li>ii. The proponent should ensure that for the displaced houses, land, farms etc., should be compensated as per their value and on time.</li> <li>iii. The project is accepted because it will facilitate transportation of goods, crops and livestock which will lead to increase in revenue.</li> </ul>	The proponent will take into consideration on the all issues raised by the stakeholders.
meon S. wiyogohe	Livestock and Fisheries Department		<ul style="list-style-type: none"> <li>i. The project will lead to decrease in grazing areas, hence there should be special areas for grazing livestock.</li> <li>ii. Increase in business opportunities as it will simplify the transportation of livestock products and fishery products without been deteriorated.</li> <li>iii. The proponent should consider pathways for the livestock and people to pass either one or two points.</li> </ul>	The proponent will take action of all concerns that has been raised by the stakeholders.
eeema T. Juma	Department of Tradition and Sports		<ul style="list-style-type: none"> <li>i. Awareness should be provided to the community regarding gender education as there will be increase in interaction and new cultural from the foreigners which will lead to moral erosion and outbreak of diseases.</li> <li>ii. The project coverage should consider the cemeteries areas and if there will be necessity to displace graves, consultation should be done to the concerned community.</li> </ul>	<ul style="list-style-type: none"> <li>i. Sexual education and awareness will be provided to community.</li> <li>ii. The proponent will take into consideration on the all issues raised by the stakeholders.</li> </ul>
DC	Kombe		<ul style="list-style-type: none"> <li>i. Employment opportunities should be given priority to local community in vicinity area Employment are being given to external people while the local community in</li> </ul>	<ul style="list-style-type: none"> <li>i. Employment opportunities should be given priority to</li> </ul>

ame	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<p>the area are not given any consideration.</p> <ul style="list-style-type: none"> <li>ii. Increase of income of individuals and the community in general due to involvement in business</li> <li>iii. Improvement of transport and transportation of goods and people</li> <li>iv. Loose of land for agriculture and displacement of houses</li> <li>v. It can contribute into moral degradation in the community due social interaction. For example, prostitution, theft</li> </ul>	<ul style="list-style-type: none"> <li>i. local community in vicinity area</li> <li>ii. The project should provide walkways for people and animals</li> </ul>
DC	Ugansa Village		<ul style="list-style-type: none"> <li>i. Employment opportunities should be given priority to local community in vicinity area</li> <li>ii. Employment opportunities to our people due to availability of different jobs that requires large number of workers</li> <li>iii. It will improve transport and transportation of agricultural goods to external market that will contribute to good price of our commodities</li> <li>iv. People will lose their agricultural land and houses to enable the construction of new railway</li> <li>v. The incidents and accidents to animals and people(pedestrian) when the train stats operating due to its speed as known</li> <li>vi. Destruction of village roads when moving to-and fro for picking materials used for construction such as aggregate and sand.</li> </ul>	<ul style="list-style-type: none"> <li>i. Employment opportunities should be given priority to local community in vicinity area</li> <li>ii. Affected people should be compensated so as to facilitate establishing their new settlement and buying agricultural land.</li> <li>iii. The project should install safety signs and provide cross ways to animals and pedestrians in risky areas such as towns, populated areas and areas where animals are used to cross to other side of the railway.</li> <li>iv. The project should maintain the village roads damaged during construction</li> </ul>
DC	Usinge Village		<ul style="list-style-type: none"> <li>i. Village roads are being damaged during construction</li> <li>ii. The project should maintain the village roads damaged during construction</li> <li>iii. The local community should be considered for employment opportunities during the project implementation</li> <li>iv. Employment are usually being given to other people from other villages</li> <li>v. The security of the village might be low due to large number of workers from different areas with different behavior.</li> <li>vi. The improvement of wellbeing of the community due to involvement in business during and after construction</li> </ul>	<ul style="list-style-type: none"> <li>i. The project should maintain the village roads damaged during construction</li> <li>ii. The local community should be considered for employment opportunities during the project implementation</li> </ul>
DC	Mtapenda Village		<ul style="list-style-type: none"> <li>i. It will facilitate investment to the community due to transport and transportation availability</li> </ul>	<ul style="list-style-type: none"> <li>i. The project should employ local community within</li> </ul>

ame	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
			<ul style="list-style-type: none"> <li>ii. It creates temporary employment to the community</li> <li>iii. It will facilitate business in the area</li> <li>iv. Pollution to environment due to dust and water sources pollution</li> <li>v. Increasing of accident in society due to the speed of new system of electric train</li> <li>vi. Disease eruption due to increase of people from different areas</li> <li>vii. Moral degradation that might be caused by introduction of new cultural behaviors from other communities from other areas.</li> <li>viii. Compensation paid during resettlement project are always not relevant to what has been lost</li> <li>iii.</li> </ul>	<ul style="list-style-type: none"> <li>the area</li> <li>ii. The project should use dust suppression during construction</li> <li>iii. The project should install safety signs and pathways for people and animals</li> <li>iv. The project should provide health awareness to the community about different diseases that may arise due to social interaction</li> <li>v. The affected persons should be paid on time and fairly to allow them to vacate the area ready for project implementation.</li> </ul>
DC	Ulindwanoni Village		<ul style="list-style-type: none"> <li>i. People will lose their land for agriculture and settlement</li> <li>ii. Sexual harassment done by project experts to local people.</li> </ul>	<ul style="list-style-type: none"> <li>i. The affected persons should be compensated what they have lost according to the laws and regulations</li> <li>ii. The government should provide awareness to the community to report any harassment behavior during the project implementation</li> </ul>
DC	KaliuaMagharibi Village		<ul style="list-style-type: none"> <li>i. Economic growth to the people in the community who will involve fully in business and service provision during the project</li> <li>ii. Eruption of diseases due to social interaction of people from different areas</li> </ul>	Awareness should be provided to the community by the government concerning possible diseases and ways to protect the community.
DC	Kaliua Mashariki Village		<ul style="list-style-type: none"> <li>i. The income of the Kaliua district will increase and the community in general due to involvement in business during and after construction.</li> <li>ii. People from the community of Kaliua will be employed during construction</li> <li>iii. It can cause environmental pollution such as dust, noise, improper disposal of solid waste during construction due to movement of heavy machines</li> <li>iv. The project should consider both women and men in the community when employing people for the project</li> <li>iii. The project should use dust suppression vehicles during</li> </ul>	<ul style="list-style-type: none"> <li>i. The project should consider both women and men in the community when employing people for the project</li> <li>ii. The project should use dust suppression vehicles during construction to minimize effect related to dust.</li> </ul>



Name	Institution	Designation	Comments/Issues	Response For Raised Issues/Concern
DC	Imalamihayo Village		<p>construction to minimize effect related to dust.</p> <ul style="list-style-type: none"> <li>i. Lose of agricultural land and settlement to allow the construction of the railway</li> <li>ii. Sexual harassment to both men and women done by external experts to the community</li> <li>iii. It will facilitate business to the community due to large number of workers that will be involved during construction who will buy food and other necessary needs</li> <li>iii. More people will be employed during construction. Imalamihayo community probably will be among of the workers during construction</li> <li>iv. The project should compensate the affected people fairly</li> <li>v. The project should provide awareness to the contractors and the community to behave in a good manner</li> <li>vi. Casual workers should be taken from the local community during the project implementation</li> <li>vii.</li> </ul>	<ul style="list-style-type: none"> <li>i. The project should compensate the affected people fairly</li> <li>ii. The project should provide awareness to the contractors and the community to behave in a good manner</li> <li>iii. Casual workers should be taken from the local community during the project implementation</li> </ul>

## 6 ASSESSMENT OF IMPACT AND IDENTIFICATION OF ALTERNATIVES

### 6.1 Introduction

This chapter of the ESIA report describes and assesses the environmental and associated socio-economic impacts, both positive and negative, likely to result from the proposed construction of the Electrified SGR line from Tabora to Kigoma in accordance with the National Legislation of Tanzania, with reference to International Best Practice Guidelines (IFC Performance Standards on Environmental and Social Sustainability and The Equator Principles EP4). Impacts were identified throughout the ESIA process by means of public consultation, detailed specialist investigations, the analysis of collected data and professional judgment.

The first phase of impact assessment is the identification of project activities and aspects and the resulting impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathways and an assessment of the sensitivity of the receiving environment to change. The significance of the impact is then assessed by rating each variable according to defined criteria as provided in the subsequent section.

The proposed SGR railway line project may have environmental and socio-economic impacts throughout its life cycle, which include project mobilization, construction, operation and decommissioning phases. The severity and significance of these impacts will differ based on the condition of the surrounding environmental and social elements.

The placement of the SGR railway line and its ancillary facilities covering a total distance of 411 km will span across seven districts, namely Tabora urban, Uyui, Urambo, Kaliua, Uvinza, Kigoma Council and Kigoma urban. These Districts are located within two regions, namely Tabora and Kigoma. During each phase of the project, specific activities and interventions may lead to environmental changes and social consequences. It is essential to thoroughly assess and monitor these impacts to minimize negative effects on the natural environment and social well-being. By considering and addressing these impacts, the project aims to promote responsible and sustainable development while maximizing positive outcomes for the local communities and the environment.

Impacts are considered to be significant if they:

- i. Are extensive over time and space;
- ii. Are intensive in concentration or proportion to assimilative capacity;
- iii. Result in sub-standard environmental conditions as pertains to environmental standards (i.e. notably Tanzanian environmental standards in this case) or thresholds;
- iv. Do not comply with environmental policies, land use plans, and/or a sustainability strategy;
- v. Adversely and seriously affect the environment and ecologically sensitive areas;
- vi. Adversely and seriously affect heritage resources, other land uses, communities, their livelihoods or indigenous people's traditions and values; and

- vii. Positively affect the environment or the people living in the area.

The impact analysis is based on the following major criteria:

- i. Likelihood Terms to be used include unlikely, likely or certain they refer to the level of possibility that the impact will occur;

*Unlikely* will mean that the possibility of occurrence is limited or none because of the inherent nature of the project and design to be used;

*Likely* will refer to the possibility that the impact may occur; and

*Certain* will mean that the impact will surely occur irrespective of the preventive measures adopted.

- ii. Duration

This will refer to the life of the impact or recovery time for the impacted environment to its natural state. The terms to be used include:

- a. *Short-term* {0-2 years},
- b. *Medium-term* {2-10 years},
- c. *Long term*- more than 10 years and
- d. *Permanent* which will refer to the impacts that will persist in perpetuity.

- iii. Extent

This will assess the relative size of the receptor (geographic area of the affected environment or community) affected by the impact. Terms to be used are: local, regional, and beyond regional;

- iv. Intensity

This parameter assesses the magnitude of the impact or violation of a certain standard;

- v. Reversible Impact

An impact whereby the environment can return to its natural state from, for example, some form of pollution. The opposite of this is an irreversible impact, which will remain regardless of mitigation measures implemented;

- vi. Direct impact: An impact or effect that is caused by a project and occurs at the same time and same place of operation, and as a result of the operation.
- vii. Indirect Impact: An impact or effect that is reasonably foreseeable and caused by a project, but occurs at a different time or different place;
- viii. Degree of significance – this will incorporate the above-mentioned parameters {likelihood, duration and magnitude} to determine how severe the impact will be. The level of severity or degree of significance will be categorized as: *low, medium (moderate) or high*.

Several impacts associated the project are discussed in this section. Environmental categories potentially impacted upon by project activities and assessed in this chapter include:

- i. Geology;
- ii. Topography;
- iii. Soils;
- iv. Land capability and Land use;
- v. Air quality and Dust;
- vi. Hydrology and Surface Water Resources
- vii. Geo-hydrology;
- viii. Ecology, biodiversity, sceneries and nature conservation;
- ix. Archaeology and cultural heritage;
- x. Traffic and transportation;
- xi. Noise and Vibrations;
- xii. Contaminated land and waste management
- xiii. Socio-Economic Aspects; and
- xiv. Occupational Health and Safety Aspects.

The potential impacts resulting from project-related activities during railway construction and operations phase on the above environmental categories were identified and the significance of the various impacts determined.

Sections 6.2 and 6.3 describe the activities and impacts associated with the various phases of the project.

## **6.2 GENERAL ENVIRONMENTAL ASPECTS OF TABORA-KIGOMA SGR LINE**

There are positive or beneficial impacts as well as negative or adverse impacts which the project will generate to the communities that are within the area of influence of the project, the Districts, Regions and the Nation as a whole.

## 6.3 DESCRIPTION OF ACTIVITIES AND ASPECTS ASSOCIATED WITH THE PREPARATION, CONSTRUCTION, OPERATION, CLOSURE AND DECOMMISSIONING PHASES OF THE PROJECT

### 6.3.1 Mobilization (Preparation) Phase

Prior to mobilization, preparations will be made to enhance the site accessibility and ensure smooth mobilization activities. Accessibility of the project site will entail rehabilitation of the existing road sections to the project sites along the proposed railway corridor and clearance of vegetation to enable expansion of the access roads within different project areas. Vegetation clearance will be carried out in accordance with the requirements of the Forestry Act, 2003.

Further preparations will entail, though to a limited extent, clearance of vegetation to provide room for construction of temporary structures of the contractor's camp and tools storage facilities.

With regards to the mobilization phase of the project, the following activities will be required: -

- i) Mobilization of Resources: Gathering and mobilizing all the necessary resources, including human resources, equipment, materials and finances, to begin the construction phase;
- ii) Site Preparation: Clearing and preparing the construction sites to make them ready for the commencement of construction activities. This may involve land clearing, earthmoving, and site layout;
- iii) Establishment of Construction Camps: Setting up temporary construction camps near the construction sites to accommodate construction workers, staff, and support facilities;
- iv) Construction Workshops and Facilities: Establishing workshops and facilities for the maintenance and repair of construction equipment, machinery and vehicles;
- v) Health and Safety Measures: Implementing stringent health and safety protocols to ensure the well-being of workers and compliance with safety regulations;
- vi) Mobilization of Labor: Recruiting and training skilled and unskilled labor required for various construction tasks;
- vii) Equipment Deployment: Deploying construction equipment, machinery and tools necessary for construction activities such as excavators, bulldozers, cranes and concrete mixers;
- viii) Material Procurement: Procuring construction materials, such as steel, cement, aggregates and other resources required for the construction process;
- ix) Survey and Marking: Conducting detailed surveys and marking the alignment of the railway track, station locations, and other key facilities; and
- x) Creating water bodies and fauna refuge areas.

Commenté [L.O1]: Land acquisition missing in the list

The potential environmental impacts generated by the above-mentioned preparation activities include:

- i) Increased possibility for bush fire;
- ii) Accidents involving human, livestock and small fauna from moving trucks and operating equipment;
- iii) Loss/disturbance of biodiversity and land degradation due to vegetation clearance;
- iv) Interference/destruction of fauna pathways or routes;
- v) Noise increase from traffic and machines/equipment;
- vi) Visual alteration to the project area;
- vii) Alteration of indigenous culture due to population increase;
- viii) Pollution of land and water resources from hydrocarbon spills;
- ix) Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, Cholera and COVID-19;
- x) The impacts associated with blocking of some of the existing road that cut across the railway corridor;
- xi) Loss or inaccessibility of medicinal plants by the community from the project site; and
- xii) Air pollution from moving equipment and machinery in the site (dust, noise, fugitive).

**Commenté [L.O2]:** Include:

1. Displacement
2. population influx
3. GBV
4. Loss of cultural heritage
5. disruption of access to certain social amenities
6. community health and safety

**Table 6-1: Analysis and classification of impacts during Mobilization Phase of the project**

SN	Impacts	Analysis of the Impact	Classification of the Impacts
6.3.1(i)	Increased possibility for bush fire.	<ul style="list-style-type: none"> <li>i. Accumulation of flammable materials: When vegetation is cleared, it leaves behind dry, dead plant material and debris, which acts as fuel for fires. This accumulation of flammable material provides abundant material for fires to ignite and spread rapidly;</li> <li>ii. Alteration of fire behavior: The removal of vegetation can change the natural fire behavior in the area. Open landscapes with reduced vegetation cover are more susceptible to high-intensity fires that spread quickly and are challenging to control;</li> <li>iii. Increased human activities: Setting up the camping area for accommodation, vehicle and machinery operations can lead to increased human activities in the project area. This can result in the accidental ignition of fires through carelessness, such as careless smoking or unauthorized activities;</li> <li>iv. Flammable substances theft: The presence of fuel for vehicles and machinery creates the risk of theft by unauthorized individuals. Stolen flammable substances can be used carelessly or maliciously, leading to fire incidents.</li> </ul>	Indirect, long-term, adverse, local, irreversible and of moderate significance.
6.3.1(ii)	Accidents to human, livestock, and small fauna from moving trucks and operating equipment	<ul style="list-style-type: none"> <li>i. Increased vehicle, people and machinery movement during the mobilization stage, coupled with poor road safety measures such as the absence of necessary diversions and road signs, can lead to unnecessary road accidents involving</li> </ul>	Indirect, long-term, adverse, local, irreversible and of moderate significance.

SN	Impacts	Analysis of the Impact	Classification of the Impacts
		<p>livestock, wild animals, and vulnerable individuals, especially children, disabled individuals and the elderly;</p> <p>ii. The operation of heavy equipment and the expansion of road networks can destroy natural habitats and fragment ecosystems. This disruption hinders the movements and habitats of small fauna, making it difficult for them to find food, shelter, and breeding grounds;</p> <p>iii. Livestock, such as cows, sheep, and horses, often graze near roadways and face the risk of being hit by moving trucks or vehicles. These accidents can cause injuries or fatalities to the animals, resulting in economic losses for livestock owners;</p> <p>iv. Accidents can lead to property damage, medical expenses, lost wages, and increased insurance premiums, placing a financial burden on affected individuals and communities; and</p> <p>v. Injuries and fatalities: Accidents involving moving trucks or heavy equipment can result in serious injuries and even loss of life for pedestrians, cyclists, motorcyclists, and occupants of other vehicles. The size and weight of these vehicles make collisions particularly hazardous.</p>	
6.3.1(iii)	Loss/disturbance of biodiversity and land degradation due to vegetation clearance	<p>i. There might be increased fauna habitat destruction due to vegetation clearing and excavation works for project development;</p> <p>ii. Vegetation clearance leads to the direct loss of natural habitats, which are crucial for supporting diverse plant and</p>	Direct, long-term, adverse, local, irreversible and of moderate significance.



SN	Impacts	Analysis of the Impact	Classification of the Impacts
		<p>animal species. Many species may lose their homes and struggle to survive or face extinction;</p> <p>iii. The removal of vegetation can disrupt intricate ecological relationships within ecosystems. Many species rely on specific plants for food, shelter, and nesting, and their removal can disrupt these relationships, affecting species populations;</p> <p>iv. Some plant and animal species play critical roles in maintaining the balance of ecosystems. When these keystone species are removed due to vegetation clearance, it can have cascading effects on the entire ecosystem;</p> <p>v. Habitat loss and fragmentation resulting from vegetation clearance can lead to reduced genetic diversity within populations, making them more vulnerable to diseases and environmental changes; and</p> <p>vi. Moreover, the improved road might attract more people to settle in the villages and hamlets along the road and near project site which will contribute to biodiversity disturbances.</p> <p>Land Degradation:</p> <p>i. Soil erosion: Without vegetation to hold the soil in place, it becomes vulnerable to erosion by wind and water, leading to the loss of fertile topsoil and reduced agricultural productivity;</p> <p>ii. Vegetation helps absorb and slow down rainfall, reducing runoff. With vegetation clearance, there is an increase in</p>	

SN	Impacts	Analysis of the Impact	Classification of the Impacts
		<p>surface runoff, leading to higher risks of flooding and sedimentation of water bodies; and</p> <p>iii. Large-scale vegetation clearance can lead to desertification, where once fertile land turns into arid and unproductive desert-like areas.</p>	
6.3.1(iv)	Interference/destruction of fauna pathways or routes.	<p>This will occur due to increased vehicles and equipment/ Machinery movement within or outside the project affected areas.</p> <p>The interference or destruction of fauna pathways or routes can have significant negative impacts on wildlife populations and ecosystems. These pathways, often referred to as wildlife corridors or migration routes, are essential for the movement and survival of various animal species. When these routes are disrupted or destroyed, several adverse effects can occur such as increase wildlife-human conflict.</p> <p>Wildlife corridors play a crucial role in maintaining biodiversity by facilitating gene flow and species movements. Disruption of these pathways can result in reduced biodiversity, affecting the overall health and resilience of ecosystems.</p>	Direct, long-term, adverse, local, irreversible and of moderate significance.
6.3.1(v)	Noise increase from traffic and machines/equipment.	<p>Noise will be produced by vehicles and machinery during delivery or transportation of materials and site clearance might cause:</p> <p>i. Disturbance of wildlife, loud noises can disrupt natural behaviors of wildlife, including feeding, mating, and communication. Animals may become stressed, leading to changes in their movements and potentially avoiding certain areas altogether;</p>	Direct, temporally, low, local, irreversible and of moderate significance.

SN	Impacts	Analysis of the Impact	Classification of the Impacts
		<ul style="list-style-type: none"> <li>ii. Wildlife, particularly sensitive species, can experience increased stress due to constant exposure to loud noise. This stress can lead to physiological changes and impact their overall health and reproductive systems; and</li> <li>iii. Noise pollution: Noise from traffic and machinery is a form of environmental pollution that can affect human health. Prolonged exposure to high noise levels can lead to stress, sleep disturbances, and even hearing loss.</li> </ul>	
6.3.1 (vi)	Visual alteration to the project area	Loss of vegetation cover will mainly occur in areas set for campsites, railway line, stations, borrow pits and quarries and widening of the access roads. In these areas' trees, shrubs, grasses and natural habitats will be affected.	Direct, long-term, adverse, local, irreversible and of moderate significance.
6.3.1(vii)	Alteration of indigenous culture due to population increase.	<ul style="list-style-type: none"> <li>i. The increase in population within indigenous communities which resulted from the project activities can lead to significant and intricate effects on their social, cultural, economic, and environmental aspects;</li> <li>ii. This can result in various consequences, including the loss of traditional practices and knowledge, changes in social structures and values, reduced autonomy and decision-making power, internal displacement and migration, and the endangerment of sacred sites and cultural landmarks; and</li> <li>iii. The impacts of population increase can be profound and multifaceted, affecting the core identity and well-being of indigenous communities.</li> </ul>	Indirect, long-term, adverse, local, irreversible and of moderate significance.

SN	Impacts	Analysis of the Impact	Classification of the Impacts
6.3.1(viii)	Pollution of land and water resources from hydrocarbon spills.	<ul style="list-style-type: none"> <li>i. Equipment maintenance activities, such as changing tires, oils, and greasing during vehicle and equipment maintenance, can result in hydrocarbon spills. These spills can have several detrimental effects on the environment and water resources.</li> <li>ii. Hydrocarbons from spills can seep into the soil, causing long-term contamination and negatively impacting soil fertility, hindering plant growth, and disrupting natural ecological processes.</li> <li>iii. Furthermore, spilled hydrocarbons can contaminate water bodies, including rivers, lakes, and oceans, leading to water pollution. This pollution can harm aquatic life and disrupt entire aquatic ecosystems.</li> </ul>	Long term, adverse, reversible and of moderate significance.
6.3.1 (ix)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, Cholera and COVID-19	The proposed project will attract people from various areas seeking job opportunities. Like any other project with significant recruitment, the influx of labour heightens the risks associated with sexual transmitted diseases, COVID-19 etc. The most health risk is on HIV/AIDS and covid-19 epidemic. For instance, the challenges of low or irregular incomes among young women aged 15 – 45 years is HIV/AIDS risk factor, which can influence high infection rate in the project area. However, poor road networks in villages surrounding the project hamper the easier transmission of education on the prevention of HIV/AIDS to reach large number people in the areas.	Indirect, short-term, diverse, local, reversible and of moderate significance
6.3.1 (xi)	Loss or inaccessible of medicinal plants by the community from the project site.	Most of the herbalist who depends medicinal plants from the project site will not be able to access medicinal plants as the area will be prohibited for project development. Loss of medicinal plants will cause economic and socio impacts to the surrounding communities.	Indirect, short-term, diverse, local, reversible and of high significance

SN	Impacts	Analysis of the Impact	Classification of the Impacts
		Traditional healers and herbalists in the area may lose their source of medicine, leading to a decline in their ability to provide for their communities. This loss can also result in increased health problems and reduced access to healthcare services, particularly for those who cannot afford to access modern healthcare facilities.	
6.3.1 (xii)	Air pollution from moving equipment and machinery in the site (dust, noise, fugitive).	<p><b>Dust</b></p> <p>Site clearing for infrastructure, construction of access roads etc., will entail removal of the top soil and overburden for processing plant developments. Offloading and unloading of construction materials will cause the generation of dust, thus resulting in the deterioration of the air quality with potential to cause Upper Respiratory Tract Infection (URTI) problems to the workers and neighboring local communities.</p> <p><b>Noise</b></p> <p>Noise from vehicles and heavy machinery will, in the short-term, scare away certain wildlife species from the project area, including large and small mammals, reptiles and birds.</p> <p><b>Noxious gases</b></p> <p>Noxious gases will be mainly triggered by heavy machinery and tracks.</p>	Direct, short-term, diverse, local, reversible and of moderate significance
6.3.1 (xiii)	Disruption of wildlife corridor ( i.e Ugala river game reserve)due to vehicles movement and human activities	<p>i. The disruption of a wildlife corridor, such as the Ugala River Game Reserve, due to vehicles' movement and human activities can have significant and negative impacts on wildlife and the ecological balance of the area. Wildlife corridors are essential pathways that allow animals to move</p>	Direct, long-term, diverse, local, reversible and of high significance

SN	Impacts	Analysis of the Impact	Classification of the Impacts
		<p>between different habitats, access food and water sources, and engage in essential breeding and migration activities. When these corridors are disrupted, several adverse effects can occur;</p> <ul style="list-style-type: none"> <li>ii. Wildlife corridors play a crucial role in connecting different habitats, allowing animals to disperse and maintain gene flow between populations. Disruption of these corridors can lead to fragmentation, isolating animal groups and reducing genetic diversity. This can make species more vulnerable to diseases, genetic abnormalities, and environmental changes;</li> <li>iii. Restricted Movement: When wildlife corridors are obstructed by vehicles and human activities, animals may have limited access to necessary resources, such as water and food, leading to increased competition and stress among species; and</li> <li>iv. Wildlife corridors promote biodiversity by facilitating the movement of various species. Disruption of these corridors can lead to a decline in biodiversity as some species may struggle to adapt to the changing landscape or face barriers to essential habitats.</li> </ul>	
6.3.1(xiv)	Displacement Impact of people and their properties	<ul style="list-style-type: none"> <li>i. The development of the Tabora-Kigoma SGR line will result in both physical displacement (the loss of a home and the need to relocate) and/or economic displacement (loss of livelihoods), which could have various negative consequences for those affected;</li> <li>ii. Based on the current design of the railway line corridor, a total of 246.6 square kilometers of land will be required for the</li> </ul>	Direct, long-term, diverse, local, irreversible and of moderate significance

SN	Impacts	Analysis of the Impact	Classification of the Impacts
		<p>railway line, stations, freight yards, and marshalling yard along the corridor. The majority of the land to be acquired is owned by individuals, although in some areas, it is owned by village governments;</p> <p>iii. To address the concerns related to land acquisition and compensation, the Project is obligated to adhere to Tanzanian legislative requirements for land acquisition, compensation, and resettlement. Furthermore, the project has committed to meeting the relevant International Financing Standards, such as the Equator Principles III and the Performance Standards (PS) of the International Finance Corporation (IFC) PS5. These standards aim to ensure that the rights and interests of affected communities and individuals are protected during the land acquisition process and that appropriate compensation and resettlement measures are put in place; and</p> <p>iv. The ultimate goal is to mitigate the negative impacts of land acquisition on communities and individuals by respecting their rights and ensuring they receive adequate compensation for their land and properties. By adhering to these standards and regulations, the project aims to address potential adverse social impacts associated with land acquisition and promote responsible and sustainable practices throughout the construction and operational phases of the railway line project.</p>	

### 6.3.2 Construction Phase

This section will consider the activities and associated impacts expected to be generated during construction of the Tabora-Kigoma SGR railway and its associated infrastructures. The acquisition of land is in progress, hence change of land use and resettlement of people and their property has not been completed yet. The associated infrastructures required to support the proposed SGR project include: New railway line consisting of earthworks, Elevated structure, Bridge, Culverts, Tunnels, Viaduct, Permanent way, Stations, Buildings and shops, Fencing of the line, Signaling and Telecommunications, IT systems and Electrification systems of the standard gauge (1,435 mm) railway line from Tabora to Kigoma (approximately 411) Kilometer main line and 95 Kilometer Sidings/Passing Loops), workshop, marshalling yard and freight yard.

The following are activities that will take place during the construction phase of the Tabora - Kigoma SGR line project:

- (i) Erection of a contractor's camp;
- (ii) Construction / rehabilitation of project access road;
- (iii) Construction of permanent camp;
- (iv) Contractor demobilization and handover;
- (v) Site clearance i.e vegetation clearing and soil stripping;
- (vi) Establishment of domestic and waste water infrastructures;
- (vii) Construction of site structures i.e stations, workshop, marshalling yard, bridge, culverts, change room, laboratory, soccer field etc.;
- (viii) Construction of the main railway line and its ancillary facilities;
- (ix) Fabrication work including metal cutting (Gas cutting, welding); and
- (x) Water management system.

The potential environmental impacts generated by the above-mentioned construction activities include:

#### 6.3.2.1 *Negative Impacts*

- i) Pollution of land, surface and groundwater from oil spills/leakages and sewage contamination;
- ii) Loss/disturbance of biodiversity due to vegetation clearance;
- iii) Deterioration of air quality due to fugitive dust emissions from construction activities;
- iv) Increased sediment loads in the river valleys and streams due to erosion of exposed surfaces;



- v) Traffic accidents involving pedestrians, livestock, and wildlife due to increased traffic in the project area during construction;
- vi) Increase in noise from the construction activities i.e. welding activities, power plant, movement of the heavy machines (excavator, dozer) trucks/vehicles, generators and traffic;
- vii) Loss of aesthetics/visual of the area;
- viii) Increase of vectors and pest diseases;
- ix) Health impacts to workers due to the presence of noise, fumes, and accidents;
- x) Interference with the drainage systems due to construction activities that might led to topographic changes of the project area;
- xi) Waste generation i.e. timber, electrical waste, Solid waste containers of paint, domestic Waste etc.;
- xii) Loss of indigenous /threatened flora and fauna species;
- xiii) Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, Cholera and COVID-19;
- xiv) Unstable slopes and increased potential for landslides;
- xv) Increase pressure on natural resources and social services; and
- xvi) Loss of employment at the closure of the construction phase.

#### 6.3.2.2 *Positive Impacts*

- i) Increase employment opportunities;
- ii) Improved local economy; and
- iii) Increase government revenue generation.

**Table 6-2: Analysis and classification of impacts during Construction phase of the project**

SN	Impact	Analysis of Impact	Classification of the Impacts
6.3.2 (i)	Pollution of land, surface and groundwater from oil spills/leakages and sewage contamination.	<ul style="list-style-type: none"> <li>i. There is potential leakage of oils and fuels during construction phase of the project. The leaking of oils and fuels from the vehicles and equipment may seep into the groundwater and contaminate the ground water resources. The contaminated water may be collected for domestic use within the project or community at large. If proper measures are not taken the oil spills may pollute the environment including soil, ground and surface water resources;</li> <li>ii. Improper sewage system during project construction phase may result into contamination of ground and surface water and may be a cause of pollution and associated health problems to workers and local communities around the project area;</li> <li>iii. Furthermore, poor sewage may generate diseases like diarrhoea, fever, cramps, and sometimes vomiting, headache, weakness, or loss of appetite. Other bacteria and diseases carried by sewage and wastewater include; - typhoid fever, salmonella, and cholera;</li> <li>iv. Most of construction equipment consume significant quantities of lubricants and fuels. Regular maintenance of equipment and machines will generate significant quantities of used hydrocarbons that may contaminate the land resources when improperly handled and managed; and</li> <li>v. Equipment maintenance activities needs to be carried out at a well-established maintenance workshop. This is meant to limit and confine any possible spill to the surrounding environment and making it simple to mitigate the impact when it occurs.</li> </ul>	Indirect, long-term, adverse, local, irreversible and of high significance.

SN	Impact	Analysis of Impact	Classification of the Impacts
6.3.2 (ii)	Loss/disturbance of biodiversity due to vegetation clearance.	<ul style="list-style-type: none"> <li>i. The Construction of SGR line Tabora-Kigoma section and its supporting infrastructure entails clearing sites and the corridor where the project will be located. Site clearance will remove the vegetation cover and disturb the natural habitat of the area;</li> <li>ii. The region encompassing Igombe Game Reserve through the Malagarasi Ramsar site into Uvinza is home to a significant population of fauna with varying IUCN categorical statuses. Igombe Game Reserve serves as a crucial wildlife corridor, connecting protected areas in the south, such as Tongwe East and West and Ugalla River National Park, with those in the north, including Moyowosi and Kigosi Game Reserves. Additionally, there are other animal dispersal areas located west of the Malagarasi River. Several species in this region are classified as vulnerable or higher according to the IUCN, triggering OS 3 and PS 6 criteria 1 to 3. These species include Elephants (<i>Loxodonta africana</i>) (EN), Leopards (<i>Panthera pardus</i>) (VU), Giant Pangolins (<i>Smutsia gigantea</i>) (EN), Lions (<i>Panthera leo</i>) (VU), and Spotted Hyenas (<i>Crocuta Crocuta</i>) (V);</li> <li>iii. The construction of the railway line involves vegetation clearance and subsequent operations, which poses risks of significant habitat loss, fragmentation, alteration, and disturbance. Moreover, it can lead to the spread of invasive species and direct harm to wildlife through trampling and accidents. This substantial loss of biodiversity resulting from the project will contribute to the decline of species recognized by the IUCN as vulnerable; and</li> <li>iv. The evaluation of biodiversity loss from the construction of the Tabora-Kigoma railway indicates a moderate impact, with a localized extent of spread and long-term consequences.</li> </ul>	Direct, long-term, adverse, local, reversible and of moderate significance.

SN	Impact	Analysis of Impact	Classification of the Impacts
6.3.2 (iii)	Deterioration of air quality due to dust, noxious gases and fugitive emissions from construction activities.	<p><b><u>Dust</u></b></p> <ul style="list-style-type: none"> <li>i. Dust will be mainly from Site clearing, construction and rehabilitation of access roads, etc., moreover, some of the activities will entail the removal of the top soil to pave way for construction activities. Earthworks, haulage of construction materials and moving vehicles will cause the generation of dust, thus resulting in the pollution of the air quality with potential to cause Upper Respiratory Tract Infection (URTI) problems to the workers and nearby local communities;</li> <li>ii. All these activities will generate dust that will affect nearby villages and people passing by; and</li> <li>iii. This impact will be more severe when these activities take place during the dry months of the year. Strong winds may aggravate the impact associated with dust.</li> </ul> <p><b><u>Noxious gases</u></b></p> <ul style="list-style-type: none"> <li>i. Most of the construction equipment that will be used, e.g., bulldozers, excavators, wheel-loaders, trucks and other service vehicles will be diesel fueled. Combustion of diesel emits noxious gases such as CO<sub>2</sub> and NO<sub>x</sub>; and</li> <li>ii. During construction most of the equipment will be operated over a 6-hour period generating significant noxious gases during the period. With regarding to UNEP, 2001; CO<sub>2</sub> is a greenhouse gas producing 60% of the human-enhanced greenhouse effect that leads to global warming.</li> </ul>	Direct, short-term, adverse, regional, irreversible, and of high significance.

SN	Impact	Analysis of Impact	Classification of the Impacts
6.3.2 (iv)	Increased sediment loads in the river and streams due to erosion of exposed surfaces.	Excavated areas for construction will result into exposed soils prone to erosion. Furthermore, the surface and embankments of constructed/rehabilitated access roads are usually exposed and also prone to erosion. This may result in increased sediment loads in runoff during rainfall and finally sedimentation of the rivers or streams in the area.	Indirect, long-term, adverse, reversible and of Moderate significance.
6.3.2 (v)	Traffic accidents involving pedestrians, livestock, and wildlife due to increased traffic in the project area during construction.	Trucks and vehicles carrying supplies, construction materials etc., to the proposed SGR line will travel frequently to and from the project area. Moreover, trucks will be travelling along the project corridor for other project related activities during construction phase. These movement may be a source of injury and fatal accidents to nearby community or project workers if precautionary measures are not in place.	Direct, short-term, adverse, regional, reversible, and of high significance.
6.3.2 (vi)	Increase in noise from heavy machines (excavator, dozer) trucks/vehicles, generators and traffic.	<ul style="list-style-type: none"> <li>i. During the construction phase of the Tabora-Kigoma SGR line, there will be earth-moving activities and the use of heavy equipment such as dozers. Trucks and vehicles will be operating continuously throughout the project, and standby generators will be employed during electricity outages. As a result, there will be continuous noise generation, which may become a nuisance for the surrounding communities;</li> <li>ii. Noise measurements were taken at different stations during both day and night time. The recorded noise levels ranged between 30–60 dB(A) during the day and 30-55 dB(A) during the night. The primary contributor to the measured noise in these areas was the movement of vehicles on the access roads connecting the villages and the project area, which intermittently resulted in elevated noise levels. However, overall, the daytime and nighttime noise levels were either within or slightly above the Tanzanian Standard and the WHO Standard;</li> </ul>	Direct, short-term, adverse, regional, reversible, and of high significance

SN	Impact	Analysis of Impact	Classification of the Impacts
		<p>iii. Some of the measured noise levels in certain project areas were found to be higher than the acceptable TBS standards during the daytime, but they were slightly within the WHO standard. The high noise levels in these villages were mainly attributed to vehicle movements, bird and insect sounds;</p> <p>During the construction phases, noise levels are expected to increase, but they are anticipated to decrease during the decommissioning and closure of the project. Villages located in proximity to the railway line and stations locations are likely to experience increased noise and vibration levels from traffic, necessitating the implementation of mitigation and management plans.</p>	
6.3.2 (vii)	Loss of aesthetics/visual of the area.	Vegetation elimination in areas earmarked for stations, marshalling yards, workshops, freight yard, camps, roads and other infrastructures expose the bare land and lead to changes and modifications of the landscape. The presence of project equipment and erected infrastructures will cause visual intrusions in the area. Furthermore, the removal of soils and vegetation cover leads to disturbance and modification of the landscape and associated aesthetic/visual alterations.	Direct, Permanent, adverse, irreversible and of Moderate significance
6.3.2 (viii)	Increase of vectors and pests diseases	Biological vectors such as mosquitos and ticks may carry pathogens that can multiply within their bodies and delivered to new hosts usually by biting. Mechanical vectors such as flies can pick up infectious agents on the outside their bodies and transmit them through physical contact. Therefore, this might be taken into consideration hence the project is located in an area which is conducive for spread of vector and pest diseases.	Indirect, short-term, adverse, local, irreversible, and of high significance
6.3.2 (ix)	Health impacts to workers due to the presence of noise, fumes, and accidents.	Construction and its associated activities such as site clearance, access road pavements, and erection of supporting infrastructures will utilize heavy equipment and trucks. These equipment produces fumes and noise which are	Indirect, Long-term, adverse, irreversible and of High significance.

SN	Impact	Analysis of Impact	Classification of the Impacts
		unhealthy to workers and nearby communities. Moreover, utilization of these equipment might cause accident to workers and surrounding communities.	
6.3.2 (x)	Interference with the drainage systems due to construction activities that might led to topographic changes and affect the natural flow of water within the project area.	<p>The construction of roads, buildings, and other structures can alter the natural topography of the area, resulting in changes to the direction and rate of water flow. This can cause flooding in areas that were not previously prone to flooding, as well as increased erosion and sedimentation in waterways.</p> <p>In addition to the physical impacts, interference with drainage systems can also have social and economic impacts. Flooding can damage homes, businesses, and infrastructure, leading to costly repairs and disruption of daily activities. Changes in water quality can also affect the availability of clean drinking water and impact the livelihoods of communities that rely on farming, and other water-dependent activities.</p>	Direct, Long-term, adverse, irreversible and of High significance.
6.3.2 (xi)	Waste generation both normal waste and hazardous waste i.e. timber, electrical waste, Solid waste containers of paint, domestic Waste, Oils, scraps metals etc.	<ol style="list-style-type: none"> <li>i. During the construction activities of the Tabora-Kigoma SGR line, it is highly expected that waste will be generated. It has been estimated that approximately 15% of the materials used during construction will result in waste. The solid waste generation will primarily stem from fabrication works, metalwork, and electronic waste, including wires and cables;</li> <li>ii. Certain construction waste materials are challenging to dispose of due to their nature and inability to be reused. Proper disposal methods, such as landfilling or transporting waste to appropriate facilities, incur high costs; and</li> <li>iii. Waste materials expected during this phase is basically from the construction of access roads. The nature of waste is basically domestics (i.e. food waste, packaging materials and human wastes. The main impacts could arise from improper disposal of food waste</li> </ol>	Direct, long-term, adverse, local, irreversible and of moderate significance.

SN	Impact	Analysis of Impact	Classification of the Impacts
		& packaging materials; and human wastes generated onsite by the construction workers. Haphazard disposal of food waste will attract scavenged birds, insects and rodents, which are diseases vectors. Human wastes carry infectious pathogens. Improper discharge or open defecation on the environment will contaminate soils, and pathogens can be carried by runoff to receiving water bodies, where they will contaminate water resources. Contamination of water resources and foods by pathogen can result in eruption of diseases such as cholera, typhoid, dysentery and diarrhoea.	
6.3.2 (xii)	Loss of indigenous /threatened flora and fauna species	<ul style="list-style-type: none"> <li>i. The cutting and clearing of trees and other vegetation cover can have an impact on threatened species. This activity can take many forms, from the total removal of all above-ground vegetation, to the selective removal of individual plants or even parts of plants from trees to grasses; and</li> <li>ii. Activities such as clearing of the vegetation and the removal of dead plant material such as dead stags (often with hollows suitable for hollow-nesting birds and mammals). These activities will automatically lead to distinction of local populations of individual species in the area.</li> </ul>	Direct, long-term, adverse, local, irreversible and of moderate significance.
6.3.2 (xiii)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.	Like other project phases, people from various parts will be increasing in the proposed project seeking job opportunities. The influx of people will heightens the risks associated with sexual transmitted diseases such as HIV, COVID-19 etc.	Indirect, long-term, adverse, local, irreversible and of high significance



SN	Impact	Analysis of Impact	Classification of the Impacts
6.3.2 (xiv)	Unstable slopes and increased potential for landslides	<ul style="list-style-type: none"> <li>i. Safety hazards: Unstable slopes and landslides can pose a risk to workers and construction equipment. It can cause accidents and fatalities, leading to project delays and increased costs;</li> <li>ii. Damage to equipment: Landslides and unstable slopes can cause damage to construction equipment, resulting in additional repair costs and project delays;</li> <li>iii. Environmental damage: Landslides can result in significant environmental damage, such as soil erosion, sedimentation of waterways, and damage to natural habitats. This can have long-term impacts on the local ecosystem and the surrounding communities; and</li> <li>iv. Increased project costs: The need for additional safety measures and equipment to manage unstable slopes and landslides can lead to increased project costs.</li> </ul>	Direct, long-term, adverse, local, irreversible and of high significance
6.3.2 (xv)	Damage to or alternation of wetland areas	<ul style="list-style-type: none"> <li>i. The proposed construction of the Uvinza-Kigadye SGR and its associated infrastructure will involve crossing several important wetland areas, including the Ruchugi River and the Malagarasi River. These wetlands are vital habitats for aquatic life, and construction activities within the sites of bridges and culverts crossing these wetlands may lead to alterations and disruptions of their ecological functions;</li> <li>ii. The impact evaluation has assessed the intensity of damage to the wetlands by the project as high, considering the size and number of wetlands to be crossed. The extent of spread for the Malagarasi wetland is transboundary, and the impact on the Ruchugi and Rungwe mpya Rivers may also have effects reaching the lake,</li> </ul>	Direct, long-term, diverse, reversible and of high significance

SN	Impact	Analysis of Impact	Classification of the Impacts
		<p>thereby affecting a transboundary lake. Consequently, the implementation of construction activities may permanently alter the wetland habitats;</p> <p>iii. Construction activities have the potential to disturb the soil and vegetation in wetlands, rendering them susceptible to erosion. This, in turn, can lead to the sedimentation of water bodies within the wetlands, affecting water quality and posing risks to aquatic organisms' health; and</p> <p>iv. Additionally, the construction of the railway line and associated infrastructure may result in alterations to the natural hydrology of the wetlands, leading to changes in water flow patterns and potential fluctuations in water levels, which could increase the risk of flooding in the area.</p>	
6.3.2 (xvi)	Risk of increased spread of Invasive Alien Species Infestation	<p>i. The construction of a railway line involves the collection and importation of materials from various parts of the world, as well as the significant influx of immigrants into the area. These activities carry the risk of introducing invasive and alien species. During construction, there is extensive movement of vehicles and machinery from one location to another, which may contribute to the spread of these invasive species and others into less infested areas. Typically, invasive/alien species outcompete native species, leading to the establishment of monospecific stands and significantly affecting biodiversity. These invasive species can range from small microscopic algae to small mammals like rodents and their presence</p>	Direct, short-term, diverse, reversible and of high significance

SN	Impact	Analysis of Impact	Classification of the Impacts
		<p>can exert significant influence on changes in food webs and water quality; and</p> <p>ii. Literature reviewed for the project indicates the existence of several invasive species, including <i>Leucaena leucocephala</i>, a tree species used as fodder for livestock, <i>Lantana camara</i>, <i>Argemone Mexicana</i>, and <i>Opuntia vulgaris</i>.</p>	
6.3.2 (xvii)	Risk of Interference with the wildlife corridors	<p>i. The Tabora - Kigoma SGR project poses a considerable risk of disrupting wildlife movement corridors in the area between Igombe and Uvinza. This region is home to diverse wildlife species and serves as crucial habitats for them; and</p> <p>ii. The construction activities involved in the project have the potential to significantly interfere with and even obstruct the movement of wildlife, including elephants, and other species traveling from Ugalla National Park to Moyowosi and Kigosi, passing through the Igombe and Uvinza wildlife ranch areas. This interference could have a substantial impact on the natural movement patterns and ecological balance of the wildlife in the region.</p>	Direct, long-term, diverse, local, irreversible and of high significance
6.3.2 (xviii)	Soil Erosion	<p>i. Soils in cleared areas and susceptible soils (i.e., shallow soils characterised with sands, gravels, stones and pebbles) around project infrastructure may experience erosion leading to a permanent loss of substrate, or a loss of the top soil horizon leading to a reduction in soil quality; and</p> <p>ii. Given the moderate to high rainfall during the wet season with an average annual total rainfall of 1500mm and the topography of the</p>	Direct, short-term, adverse, and of high significance.

SN	Impact	Analysis of Impact	Classification of the Impacts
		area, there is potential for erosion to occur within the proposed project area.	
6.3.2 (xix)	Improvement of Local economy	<p>Increased Business Activities: The influx of workers, engineers, and contractors into the area will spur increased business activities. Local businesses, such as restaurants, shops, and accommodation providers, are likely to experience higher demand, leading to increased revenue and growth in the service sector;</p> <p>The SGR project often involves the development or upgrading of infrastructure in the region, including roads, utilities, and communication networks. This improved infrastructure can enhance connectivity and accessibility, facilitating trade and economic activities in the area.</p>	Direct, long-term, Beneficial, local, irreversible and of moderate significance
6.3.2 (xx)	Increase of Employment Opportunities	The construction phase of the SGR project will require a significant workforce, leading to the creation of numerous job opportunities for local residents. This will help reduce unemployment and boost the income levels of individuals and families in the surrounding communities	Direct, short-term, Beneficial, Nation, irreversible and of moderate significance

### 6.3.3 Operational Phase of the Project

The activities associated with operational phase of the Tabora-Kigoma SGR line project include train operations, maintenance and repairs, stations operation, freight handling, ticketing and customer services, safety and security etc.

Below is the some of the potential environmental impacts generated by the above-mentioned activities during project operation include:

- i. Improved transportation and enhancement economic growth;
- ii. Impact on Noise and Vibration;
- iii. Reduce Carbon Emission;
- iv. Impact on community health and safety;
- v. Increased level of waste generation;
- vi. Increased pressure on Natural resources;
- vii. Disruption of wildlife movement and migration;
- viii. Impact on occupational health, safety and security of workers and community;
- ix. Impacts on the ambient air quality/Air pollution;
- x. Possibility of leakage or spillage of oils and fuels;
- xi. Conflict/competition over employment opportunities between newcomers and locals;
- xii. Pollution of surface and groundwater from sewage contamination and hydrocarbon spills;
- xiii. Risk of violation of children rights by project developer and child labour force on site; and
- xiv. Environmental pollution from waste materials.

**Table 6-3: Analysis and classification of impacts during Operation phase of the project**

SN	Impacts	Analysis of Impacts	Classification of Impacts
6.3.3 (i)	Increased pressure on resources (water, forest, wildlife and land)	<p>The Tabora-Kigoma SGR project's presence is expected to attract people from various places, both within and outside the affected Districts, seeking employment opportunities. However, the continuous influx of people could potentially lead to environmental degradation and pose a threat to the sustainable use of natural resources, particularly in areas such as game reserves and forests; and</p> <p>Moreover, the influx of migrant workers may place additional pressure on the already insufficient social resources, such as roads, clinics, and schools in the region. Additionally, the increased population could result in heightened demand for natural resources, including land and water, potentially straining local ecosystems and biodiversity.</p>	Indirect, long-term, adverse, local, irreversible and of moderate significance
6.3.3 (ii)	Increased Accidents	Accidents during the operation phase of the electrified SGR project can occur due to various factors, including human error, track and infrastructure issues, signal and communication failures, and incidents at railway crossings.	Medium-term, adverse, and of high significance
6.3.3 (iii)	Increased Theft on the track rails to use as scrap Metals	<ul style="list-style-type: none"> <li>i. Increased theft of track rails to use as scrap metals can have several negative impacts on the operation and safety of the electrified SGR project. Some of the key impact analysis are as follows:</li> <li>ii. When track rails are stolen, it can lead to damaged or missing sections of the railway track, posing significant safety risks to train operations. Disrupted tracks can cause derailments, accidents, and potentially harm passengers, staff, and nearby communities;</li> </ul>	Indirect, medium-term, adverse, reversible and of Moderate significance

SN	Impacts	Analysis of Impacts	Classification of Impacts
		<p>iii. The theft of track rails can disrupt train services, resulting in delays and cancellations. These disruptions inconvenience passengers, hinder freight transport, and negatively affect the overall efficiency and reliability of the railway system; and</p> <p>iv. The illegal scrapping of track rails can lead to environmental damage due to improper disposal and handling of the stolen materials. This may result in environmental pollution and degradation, impacting the surrounding ecosystem.</p>	
6.3.3 (iv)	Impact on Noise and vibration	Train operations can generate noise and vibrations, particularly in urban areas near railway tracks. This can potentially cause disturbances to nearby residents and affect the quality of life.	Direct, long-term, adverse, and of moderate significance
6.3.3 (v)	Disruption of wildlife movement and migration	The operational SGR line may intersect or pass-through wildlife habitats, leading to potential disruptions to wildlife movements and behavior. The proper wildlife corridors and mitigation measures are essential to minimize such impacts.	Direct, Long term, adverse and of high significant.
6.3.3 (vi)	Reduce Carbon Emissions	Electrified railway systems are generally more environmentally friendly than diesel-powered trains. The operational SGR line, being electrified, can contribute to reduced carbon emissions compared to other forms of transportation, promoting sustainable development.	Indirect, long-term, beneficial, local, reversible and of moderate significance
6.3.3 (vii)	Impact on community health and safety	The operation of an electrified railway system in proximity to residential areas raises concerns about community safety. Measures such as proper fencing, warning signs, and public awareness campaigns are essential to protect the community.	Indirect, long-term, adverse, local, irreversible and of moderate significance.

SN	Impacts	Analysis of Impacts	Classification of Impacts
6.3.3 (viii)	Visual Impact	The presence of railway tracks and associated infrastructure may alter the visual landscape of the region, affecting scenic views and cultural landscapes.	Indirect, long-term, adverse, local, irreversible and of moderate significance.
6.3.3 (ix)	Trade Facilitation	The operational SGR line can play a significant role in facilitating the movement of goods and commodities between Tabora and Kigoma. This improved connectivity can open up new trade opportunities and promote regional and international trade.	Direct, long-term, beneficial and of high significance
6.3.3 (x)	Enhancement economic growth	<ul style="list-style-type: none"> <li>i. The operational SGR line will provide a reliable and efficient mode of transportation for passengers and freight, enhancing connectivity between Tabora and Kigoma. This improved transportation infrastructure can facilitate economic activities, trade, and tourism in the region and neighboring countries; and</li> <li>ii. The efficient operation of SGR can stimulate economic growth by reducing transportation costs and transit times for goods and passengers. This can attract investment, create job opportunities, and boost economic activities in the surrounding areas.</li> </ul>	Direct, long-term, beneficial and of high significance
6.3.3 (xi)	Conflict/competition over employment opportunities between newcomers and locals.	Conflict between new comers and locals on employment opportunities might occur during project phases particularly during operations phase of the project.	Direct, long-term, adverse, reversible and of high significance
6.3.3 (xii)	Pollution of surface and groundwater from sewage contamination and oils/fuels	Sewage waste will mainly from toilets, sinks, showers, washing machines and stations. The project will incorporate the establishment of a worker's camps and stations facilities, which will be constructed with a sewage disposal system consisting of a biological treatment plant, which if not properly engineered could impact the surroundings	Indirect, long-term, adverse, local, irreversible and of low significance.



SN	Impacts	Analysis of Impacts	Classification of Impacts
		<p>through odour generation and contamination hence potential for disease outbreaks, etc.; and</p> <p>Leaks and spills from trucks, workshop during maintenances, generator, parking area can pollute the environment including groundwater and surface water and land. This can be harmful to waterways and plants and animals that depends on them.</p>	
6.3.3 (xiii)	Insecurity as a result of population influx	An increase in the number of people in the area compromises security and may lead to increased crime rates in an area that enjoyed calmness and peace. Wherever there is an improvement in the level of livelihood of the people, crime rates often grow proportionally due to increased opportunities of theft by the criminals.	Indirect, medium-term, adverse, reversible and of Moderate significance.
6.3.3 (xiv)	Risk for malaria from mosquitos breeding ponds and borrow pits	Some of the quarry and borrow pits will be formed during construction phase of the project, those pits will be filled up with storm and rain water thus may become a mosquito breeding area and hence a source of malaria. However, such a pit filled with water may be a source of water for wild animals, workers and the village in general.	Indirect, medium-term, adverse, reversible and of Moderate significance.
6.3.3 (xv)	Deterioration of culture and moral values	The operation of SGR project will attract the intrusion of newcomers with new culture, norms and moral values from outside the project area. In interacting with indigenous such new culture may be adopted and interfere with the indigenous culture thus abandoning their values.	Indirect, medium-term, adverse, reversible and of Moderate significance.
6.3.3 (xvi)	Violation of children rights by project Developer and child labour force on site.	The project might cause violation of child rights and abuse by project workers. The project may also risk employment of children to work in the project either as a casual its operation.	Direct, short-term, diverse, local, reversible and of moderate significance.

SN	Impacts	Analysis of Impacts	Classification of Impacts
6.3.3 (xvii)	Family or Marriage fragmentation	The implementation of the project might bring family misunderstanding to some workers and communities living adjacent to the project area. This will result due to influx of jobless people from other parts of villages who could turn themselves into sex workers and hence break some families.	Indirect, medium-term, adverse, reversible and of Moderate significance.
6.3.3 (xviii)	Environmental pollution from waste materials	<p>Major sources of waste during operation will mainly from:</p> <p><b>Domestic waste</b></p> <p>Domestic waste will often originate from the camp village, workshop, canteen, offices, shops, market etc. These wastes include remains of foodstuffs, plastic bottles, used clothes, used papers and boxes, etc. The volume of waste can be minimized by an excavated waste pit and burning of solid materials or recycling.</p> <p><b>Industrial waste</b></p> <p>The types of industrial waste that will be generated will include; - used oils, greases, empty oil containers (both plastic and metallic), scrap metals, used tires, wood waste, etc. The project will generate a significant amount of industrial waste which will require proper disposal to reduce/mitigate impacts of pollution caused by their disposal.</p> <p><b>Electronic waste (E-Waste)</b></p> <p>E waste will be generated from solar array, offices, workshop, marshalling yard, workshops etc. Examples of electronic waste include, but not limited to: computer monitors, printers, scanners, keyboards, mice, cables, circuit boards, lamps, clocks, flashlight, phones, answering machines, digital/video cameras, radios, VCRs, DVD</p>	Direct, long-term, adverse, irreversible and of High significance

SN	Impacts	Analysis of Impacts	Classification of Impacts
		players, MP3 and CD players. If these wastes are not managed properly, they might cause injury to workers, visitors and the surrounding communities.	
6.3.3 (xix)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.	As the project will entail recruitment of labor from different parts will stimulate the influx of people in the area. The risks associated with population influx will be but not limited to sexual transmitted diseases such as HIV/AIDS and COVID-19. However, poor road networks in villages surrounding the project hampers easier transmission of education on the prevention of HIV/AIDS in the area.	Indirect, long-term, diverse, local, reversible and of moderate significance

#### 6.3.4 Decommissioning phase of the project

The decommissioning phase of the SGR line project occurs infrequently, but when necessary, it involves the safe and responsible cessation of railway operations and associated infrastructure. This phase is initiated after the railway line has served its useful life or when it is no longer economically viable. During decommissioning, regular train and freight services on the SGR line are discontinued. The decision to decommission is typically influenced by factors such as evolving transportation needs, the introduction of more efficient transportation modes, or the completion of the railway's intended purpose.

The decommissioning process includes several crucial activities:

- i. **Infrastructure Assessment:** A comprehensive assessment is conducted to evaluate the condition of the SGR line's infrastructure. This assessment identifies any required remediation or restoration efforts for tracks, stations, bridges, and other associated facilities;
- ii. **Environmental Cleanup:** Measures are taken to address any adverse environmental impacts that may have occurred during the operational phase. This includes handling pollution, managing waste, and restoring the area to its natural state or repurposing it for other beneficial uses;
- iii. **Safety and Security Measures:** Throughout the decommissioning process, safety and security measures are upheld to prevent accidents and unauthorized access to railway properties. Proper fencing and signage are often installed to secure the area; and
- iv. **Asset Disposition:** The disposition of railway assets, such as trains, locomotives, equipment, and materials, is determined. Functional assets may be sold or repurposed, while others are appropriately disposed of or recycled.

The decommissioning phase requires careful planning, adherence to safety protocols, and consideration of environmental impacts. Proper management during this phase ensures a smooth and responsible cessation of railway operations and may open up opportunities for repurposing the railway corridor for other beneficial uses.

##### 6.3.4.1 *Potential Impacts:*

- i. Accidents to animals and people due to demolition works;
- ii. Air pollution from demolition activities;
- iii. Solid and Liquid waste generation;
- iv. Unemployment;
- v. Inconveniences to pensioners related to pension funds failure to pay retrenched workers in time;
- vi. Loss of income for local communities; and
- vii. Safety and security impact.

**Table 6-4: Analysis and Classification of Impacts during Decommissioning of the project**

SN	Impacts	Analysis of impacts	Classification of Impacts
6.3.4(i)	Accidents to animals and people due to demolition works.	<ul style="list-style-type: none"> <li>i. Collapsing structures are the biggest cause of fatalities during demolition activities, many of which occur as a result of improper training. Workers may be injured or lose life because they were not that an area unstable;</li> <li>ii. The hazards during demolition are falls, being stuck or buried in falling material or by the unintentionally collapse of structure. Additionally, worker may be exposed to chemical and biological agents; and</li> <li>iii. The excavated-out area, if left uncovered, could lead to accidents. A proper rehabilitation plan would need to be put in place, ensuring that all un-rehabilitated excavated areas are clearly posted with warning signs and where possible fenced to avoid any accidents.</li> </ul>	Direct, Long-term, adverse, irreversible and of High significance
6.3.4(ii)	Air pollution from demolition activities.	Demolition of structures will involve movement of heavy equipment, and trucks, loading and unloading and even blasting of hard foundations. This will generate dust, noise and noxious gases to the environment.	Direct, short-term, adverse reversible and of moderate significance.
6.3.4(iii)	Pollution from solid and liquid waste generation	<ul style="list-style-type: none"> <li>i. Improper handling and disposal of solid and liquid waste generated during this phase can lead to pollution of soil and water resources. Contaminants from waste materials may leach into the soil and groundwater, affecting local ecosystems and potentially harming flora and fauna; and</li> <li>ii. Decommissioning activities may result in habitat disruption, particularly if waste materials are not appropriately managed. Disrupted habitats can negatively impact wildlife and plant species in the affected areas.</li> </ul>	Direct, long-term, adverse irreversible and of moderate significance.

SN	Impacts	Analysis of impacts	Classification of Impacts
6.3.4(iv)	Unemployment	At the end of the project most of the workers will be retrenched and some of them may not be employed. Such people will lose their main source of income and some of them may not be able to support their families and themselves.	Direct, medium-term, adverse, reversible and of High significance
6.3.4(v)	Inconveniences to pensioners related to pension funds failure to pay retrenched workers in time	Soon after retrenchment, employees will seek payment related to their pension funds. Some pension funds may fail to pay them in time if MTT did not remit some of the workers contributions to these schemes.	Direct, short-term, adverse, reversible and of moderate significance
6.3.4(vi)	Decreased income for the local communities	Business volumes in the surrounding town or villages will therefore decrease due to decreased buying power of the retrenched employees. Furthermore, people might also move out of the area, in search of other work opportunities.	Direct, medium-term, adverse, reversible and of High significance
6.3.4(vii)	Safety and Security Impacts	Abandoned railway infrastructure can pose safety risks to the public, including the potential for accidents and trespassing. Security Concerns: Unsecured railway properties may attract vandalism and illegal activities, compromising public safety.	Direct, medium-term, adverse, reversible and of High significance

**Table 6-5: Summary of the key impacts assessed during the study, which are detailed in the previous sections of this chapter.**

PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY								
ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
Mobilization (Preparation) Phase	6.3.1 (i)	Increased potential for bush fire.	Indirect	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (ii)	Accidents to human, livestock, and small fauna from moving trucks and operating equipment.	Indirect	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (iii)	Loss/disturbance of biodiversity and land degradation due to vegetation clearance.	Direct	Long-term,	Adverse	-	Irreversible	Moderate significance
	6.3.1 (iv)	Interference/destruction of fauna pathways or routes	Direct	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (v)	Noise increase from traffic and machines/equipment	Direct	Temporally	Low	-	Irreversible	Moderate significance
	6.3.1 (vi)	Visual alteration to the project area.	Direct,	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (vii)	Alteration of indigenous culture due to population increase	Indirect	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (viii)	Pollution of land and water resources from hydrocarbon spills.	Direct	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (ix)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, Cholera and COVID-19	Indirect	short-term	Adverse	-	Irreversible	Moderate significance
	6.3.1 (x)	Loss or inaccessible of medicinal plants by the community from the project site.	Indirect	short-term	Adverse	-	Reversible	High significance

**PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY**

ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
	6.3.1 (xi)	Air pollution from moving equipment and machinery in the site (dust, noise, fugitive).	Direct	short-term	Adverse	-	Reversible	Moderate significance
	6.3.1 (xii)	Disruption of wildlife corridor ( i.e Ugala river game reserve)due to vehicles movement and human activities	Direct	Long-term	Adverse	-	Reversible	High significance
	6.3.1 (xiii)	Displacement Impact of people and their properties	Direct	Long-term	Adverse	-	Reversible	Moderate significance
Construction Phase	6.3.2 (i)	Pollution of land, surface and groundwater from oil spills/leakages and sewage contamination.	Indirect	Long-term	Adverse	-	Irreversible	High significance
	6.3.2 (ii)	Loss/disturbance of biodiversity due to vegetation clearance.	Direct, and of	Long-term	Adverse	-	Reversible	Moderate significance
	6.3.2 (iii)	Deterioration of air quality due to dust, noxious gases and fugitive emissions from construction activities.	Direct	Short-term	Adverse	-	Irreversible	High significance
	6.3.2 (iv)	Increased sediment loads in the river and streams due to erosion of exposed surfaces.	Indirect	Long-term	Adverse	-	Reversible	Moderate significance
	6.3.2 (v)	Traffic accidents involving pedestrians, livestock, and wildlife	Direct	Short-term	Adverse	-	Reversible	High significance



**PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY**

ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
		due to increased traffic in the project area during construction.						
	6.3.2 (vi)	Increase in noise from heavy machines (excavator, dozer) trucks/vehicles,) generators and traffic.	Direct	Short-term	<b>Adverse</b>	-	Reversible	High significance
	6.3.2 (vii)	Loss of aesthetics/visual of the area.	Direct	Permanent	<b>Adverse</b>	-	Irreversible	Moderate significance
Construction Phase	6.3.2 (viii)	Increase of vectors and pests diseases	Indirect	Short-term	Adverse	-	Irreversible	High significance
	6.3.2 (ix)	Health impacts to workers due to the presence of noise, fumes, and accidents	Indirect	Long-term	Adverse	-	Irreversible	High significance
	6.3.2 (x)	Interference with the drainage systems due to construction activities that might led to topographic changes and affect the natural flow of water within the project area.	Direct	Long-term	Adverse	-	Irreversible	High significance
	6.3.2 (xi)	Waste generation both normal waste and hazardous waste i.e. timber, electrical waste, Solid waste containers of paint, domestic Waste, Oils, scraps metals etc.	Direct	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.2 (xii)	Loss of indigenous /threatened flora and fauna species	Direct	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.2 (xiii)	Outbreak of diseases including but not limited to pandemic, sexually	Indirect	Long-term	Adverse	-	Irreversible	High significance

**PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY**

ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
		transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.						
	6.3.2 (xiv)	Unstable slopes and increased potential for landslides	Direct	Long-term	Adverse	-	Irreversible	High significance.
Construction Phase	6.3.2 (xv)	Damage to or alternation of wetland areas	Direct	Long-term	Adverse	-	Reversible	High significance.
	6.3.2 (xvi)	Risk of increased spread of Invasive Alien Species Infestation	Direct	Short-term	Adverse	-	Reversible	High significance
	6.3.2 (xvii)	Risk of Interference with the wildlife corridors	Direct	Long-term	Adverse	-	Irreversible	High significance.
	6.3.2 (xviii)	Soil Erosion	Direct	Short-term	Adverse	-	Irreversible	High significance
	6.3.2 (xix)	Improvement of Local economy	Direct	Short-term	Beneficial	-	Irreversible	Moderate significance
	6.3.2 (xx)	Increase of Employment Opportunities	Direct	Short-term	Beneficial	-	Irreversible	Moderate significance
Operation Phase of the Project	6.3.3 (i)	Increased pressure on resources (water, forest, wildlife and land)	Indirect	Long-term	Adverse	-	irreversible	Moderate significance
	6.3.3 (ii)	Increased Accidents	Direct	Medium-term	Adverse	-	Irreversible	High significance
	6.3.3 (iii)	Increased Theft on the track rails to use as scrap Metals	Direct	Medium-term	Adverse	-	Reversible	Moderate significance

**PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY**

ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
	6.3.3 (iv)	Impact on Noise and vibration	Direct	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.3 (v)	Disruption of wildlife movement and migration.	Indirect	Long-term	Adverse	-	Reversible	High significance
	6.3.3 (vi)	Reduce Carbon Emissions.	Direct	Long-term	Beneficial	-	Irreversible	Moderate significance
	6.3.3 (vii)	Impact on community health and safety.	Indirect	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.3 (viii)	Visual Impact.	Indirect	Long-term	Adverse	-	irreversible	Moderate significance
	6.3.3 (ix)	Trade Facilitation.	Direct	Long-term	Beneficial	-	Reversible	Moderate significance
	6.3.3 (x)	Enhancement economic growth	Direct	Long-term	Beneficial	-	Reversible	High significance
	6.3.3 (xi)	Conflict/competition over employment opportunities between newcomers and locals.	Direct	Long-term	Adverse	-	Reversible	High significance
	6.3.3 (xii)	Pollution of surface and groundwater from sewage contamination and oils/fuels	Indirect	Long-term	Adverse	-	Irreversible	Low significance
	6.3.3 (xiii)	Insecurity as a result of population influx.	Indirect	Medium-term	Adverse	-	Reversible	Moderate significance
	6.3.3 (xiv)	Risk for malaria from mosquitos breeding ponds and borrow pits	Indirect	Medium-term	Adverse	-	Reversible	Moderate significance
	6.3.3 (xv)	Deterioration of culture and moral values	Indirect	Medium-term	Adverse	-	Reversible	Moderate significance

**PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY**

ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
	6.3.3 (xvi)	Violation of children rights by project Developer and child labour force on site.	Direct	Short-term	Adverse	-	Reversible	Moderate significance
	6.3.3 (xvii)	Family or Marriage fragmentation.	Indirect,	Medium-term	Adverse	-	Reversible	Moderate significance
	6.3.3 (xviii)	Environmental pollution from waste materials.	Indirect,	Medium-term	Adverse	-	Reversible	High significance
	6.3.2 (xix)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.	Indirect	Long-term	Adverse	-	Reversible	Moderate significance
<b>Decommissioning phase</b>	6.3.4 (i)	Accidents to animals and people due to demolition works..	Direct	Long-term	Adverse	-	Irreversible	High significance
	6.3.4 (ii)	Air pollution from demolition activities.	Direct	Short-term	Adverse	-	Reversible	Moderate significance
	6.3.4 (iii)	Pollution from solid and liquid waste generation.	Direct	Long-term	Adverse	-	Irreversible	Moderate significance
	6.3.4 (iv)	Unemployment.	Direct	Medium-term	Adverse	-	Reversible	High significance
	6.3.4 (v)	Inconveniences to pensioners related to pension funds failure to pay retrenched workers in time.	Direct	Short-term	Adverse	-	Reversible	High significance
	6.3.4 (vi)	Decreased income for the local communities.	Direct	Medium-term	Adverse	-	Reversible	High significance

**PROPOSED CONSTRUCTION TABORA-KIGOMA SGR LINE AND ITS SUPPORTIVE INFRASTRUCTURES IMPACTS SUMMARY**

ACTIVITY /ISSUE	ISSUE NO.	POTENTIAL IMPACTS	CLASSIFICATION OF THE IMPACTS					
			Direct/ Indirect	Short, Medium/ Long - Term	Beneficial/ Adverse	Cumulative	Reversible/ Irreversible	Significance (High/Moderate/Low)
	6.3.4 (vii)	Safety and Security Impacts.	Direct	Medium-term	Adverse	-	Reversible	High significance

## 6.4 PROJECT ALTERNATIVES

This section identifies project development alternatives and their potential environmental impacts and recommends the best alternatives for development based on those with limited potential impacts. Project development alternatives are identified for each major component of the project such as railway line, stations, quarry, borrow pits, waste management, *power plant etc.*; and the associated potential impacts are identified and compared in order to identify the best alternatives. In assessing project development alternatives, a “No Project Alternative” has also been considered by comparing the merits and demerits of developing the project or continuing with the status-quo by considering all the potential negative and positive impacts of each alternative to the surrounding environment.

### 6.4.1 Alternative alignment

The proposed new horizontal alignment lacks viable route alternatives except in limited segments, wherein realignments will be indispensable to achieve the targeted design speeds of 160 km/h for passenger trains and 120 km/h for freight trains, respectively. The selection of these specific realignment areas is critical to ensure compliance with the desired operational velocities and accommodate the distinct requirements of passenger and freight traffic. Furthermore, stringent adherence to the designated design speeds is imperative to enhance the overall efficiency and safety of the railway system.

### 6.4.2 Alternative design speed

In this project, two design speeds were initially under consideration. The designed alignment was initially set at 120 km/h for passenger trains and 80 km/h for freight trains. However, later in the project, the decision was made to upgrade the speeds, resulting in the preferred option being 160 km/h for passenger trains and 120 km/h for freight trains, respectively. This modification was driven by the need to enhance the overall efficiency and performance of the railway system.

The selection of the second option, with the upgraded design speeds, was deemed the most favourable due to its potential to create a harmonized railway network and operational systems across the entire country. By adopting these higher speeds, the project aimed to establish a consistent and optimized rail infrastructure that would align with the ongoing new SGR (Standard Gauge Railway) railway projects, including Lot I Dar-Morogoro and Lot II Morogoro-Dodoma.

The alignment's compatibility with other key railway developments is essential to ensure seamless connectivity, interoperability, and effective utilization of resources. This strategic synchronization facilitates smooth operations, efficient freight movement, and improved passenger transportation services, bolstering the overall economic growth and development of the country.

### **6.4.3 Use of existing quarries and borrows pits**

The contractor's proposal involves acquiring land for borrow pits in areas already settled with active agriculture. However, implementing this plan would result in the economic and physical displacement of people who currently utilize these identified lands as a source of materials. Instead, the contractor emphasizes the utilization of existing quarries and borrow pits that possess sufficient materials. This approach aims to minimize the project's environmental footprint and social impact while ensuring the responsible use of resources.

Moreover, the contractor acknowledges the significant cut-and-fill operations during the project, which will generate surplus material that can be efficiently employed. By utilizing these generated materials and prioritizing existing quarries and borrow pits, the project endeavours to minimize the pressure on local resources and limit land take within the project area.

This approach not only demonstrates a commitment to sustainable and socially responsible construction practices but also aligns with the project's objectives of reducing its environmental impact. By avoiding unnecessary land acquisition and optimizing material usage, the project contributes to the preservation of valuable agricultural lands and minimizes disruptions to the local communities. Additionally, the reduction in land take and resource usage enhances the overall ecological balance and reinforces the project's positive implications for the surrounding environment and community welfare.

### **6.4.4 Alternative site for Muungano Stone quarry**

The proposed site at Muungano village for the stone quarry and crusher location has been assessed, revealing significant cultural and religious values associated with the area. It serves as a place of worship for Christians, including the Catholic and Moravian Church, and holds cultural significance as it is utilized for various local Chief's activities. The area is of particular importance due to the big cross erected on top of the hill, acting as a landmark symbolizing the area's paramount value.

To ensure compliance with PS 8 (a reference to an environmental or social safeguard), the contractor must seek alternative sources of quarry materials within the vicinity. Potential alternatives could be identified in nearby villages with rock hills or possibly near Tabora, where the railway infrastructure (MGR line) previously provided service to the quarry.

Conducting thorough assessments and consultations with the local communities and relevant stakeholders is essential to identify suitable alternative locations that have minimal cultural and religious significance. The contractor's commitment to addressing these concerns will demonstrate a proactive approach towards environmental and social sustainability, fostering a positive relationship with the affected communities and ensuring responsible and respectful execution of the project.

Furthermore, in accordance with PS 8, the contractor should implement mitigation measures to safeguard the cultural and religious heritage of the Muungano village area during construction and throughout the project's lifespan. Engaging in cultural resource management and preservation efforts will be vital to protect the area's historical and spiritual value while pursuing the necessary infrastructure development. By adhering to these practices, the project can successfully navigate the regulatory requirements and promote the long-term well-being of the community and its cultural heritage.

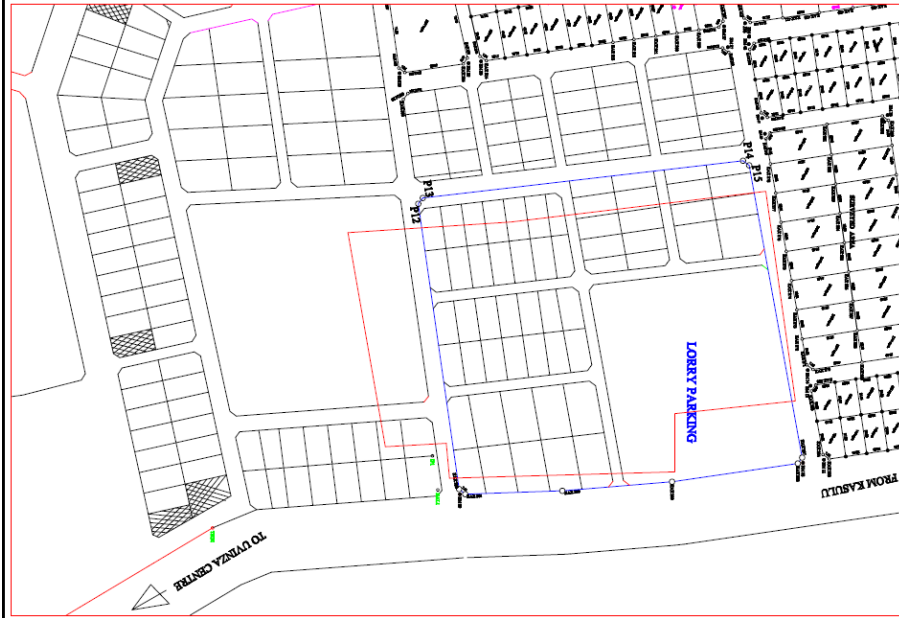
#### **6.4.5 Alternative re-orientation of the acquired camp sites-camps re-oriented to be accommodated in TP drawings for Uvinza and Nguruka**

The proposed alternative involves the re-orientation and adjustment of the area initially designated for Uvinza and Nguruka camp. This adjustment was made to minimize interference with the town planning that had already been developed for Uvinza and Nguruka towns. The shape of the land initially proposed by the contractor caused significant disruption to the town plan, cutting through planned blocks and leaving them partially affected. This necessitated the need for redrawing and re-planning.

However, working collaboratively with the district council's town planner, project managed to reorient and reshape the proposed land without altering its overall size. This adjustment allowed the planned camp to be accommodated within the existing town plan with minimal disruption. Specifically, it ensured that certain planned blocks and the lorry parking area could be preserved without significant interference.

As a result of these adjustments, the contractor will need to compensate for the affected blocks and modify their plan to align with the town's existing layout. By adhering to this approach, the project can proceed with minimum damage to the established town planning, promoting a harmonious integration of the camp into the broader urban framework. This collaborative effort between the district council, town planner, and the RESA team exemplifies a proactive approach to address potential conflicts and ensure the project's compliance with existing town development goals.





**Figure 6-1: Town planning Drawing for Uvinza town blue indicate new adjustment from proposed by contractor inner-Red**



Figure 6-2: Town planning Drawing for Nguruka town blue indicate new adjustment from proposed by contractor inner-Red

#### 6.4.6 Alternative re-sizing the proposed land for quarry and borrow pits

The proposed areas identified by the contractor for the named components are excessively large and encompass settlement and farmland areas. Acquiring such extensive land parcels, as specified, would result in the displacement of a large number of people, causing both physical and economic disruptions to the affected communities. As an alternative, the contractor should seriously consider reducing the size of land to be acquired for Mpigwa, Muungano stone quarry, and Utemini borrow pits. This reduction in land acquisition aims to minimize the project's footprint and mitigate the extent of physical and economic displacement faced by the local population.

By opting for a more restrained land acquisition approach, the project can demonstrate a commitment to responsible and sustainable development. It will help preserve valuable settlement areas and farmlands, safeguarding the livelihoods of the residents and preserving their community integrity. Additionally, minimizing the project's physical footprint will

contribute to the conservation of the natural environment and minimize ecological disturbances.

As the contractor explores this alternative, it is essential to engage in thorough consultations with the affected communities and relevant stakeholders to understand and address their concerns. This participatory approach will facilitate the identification of suitable compromise solutions that balance the project's requirements with the preservation of the local communities' well-being and resources. By adopting such a measured and inclusive approach, the project can promote positive social and environmental outcomes, aligning with best practices in sustainable development and community engagement.

#### **6.4.7 No Option Alternative**

The No Option alternative, consideration is given to a case where no project activities will be undertaken in the Project area. This case will be viable if all conditions including the above discussed alternatives for the proposed project have negative potential impacts that cannot justify the implementation of the project. The advantages of this alternative are that, the area will remain uninterrupted, and contribute to the conservation of the biodiversity in the area.

Though, if the project is allowed to continue in the area will have greater beneficial impacts than negative impacts, the implementation of the project will improve living standard of people through employment opportunities, improvement of social services like water supply, health and education services, environmental management, improvement of roads and other social services furthermore, the project will contribute to revenue earnings of villages, districts affected by the proposed SGR line and country in general through payment of taxes.

## **7 IMPACTS ENHANCEMENT/ MITIGATION MEASURES**

### **7.1 GENERAL THOUGHTS**

This chapter describes measures or actions that shall be implemented so as to enhance significant positive impacts and minimize any of the potential significant negative impacts identified in the preceding chapter. Many of the mitigation measures put forward are mostly good engineering practice that shall be adhered to during the design, pre-construction, construction, operation and decommissioning phases.

The biophysical and socio-economic impacts and recommended mitigation measures are presented in this chapter for the proposed electrified Standard Gauge Railway (SGR) construction project. The standards upon which the mitigation measures are targeted, the responsible entity and the associated mitigation costs are presented as part of the Environmental and Social Management Plan (ESMP) and thus not included in this chapter. The proposed mitigation measures have taken into account the local conditions of Tabora Municipality, Uyui, Urambo, Kaliua, Uvinza and Kigoma Districts particularly in the villages affected by SGR line. The proposed mitigation measures have also considered the avoidance of generating secondary adverse environmental impacts or residual impacts associated with the mitigated aspects. The project Proponent is committed to implementation of enhancement/mitigation measures contained in this report.

### **7.2 MITIGATION MEASURES FOR NEGATIVE IMPACTS**

Tables 7.1 comprises of the proposed mitigation measures for the identified significant negative impacts as well as enhancement measures for identified positive impacts during project phases, from Mobilisation (Preparation), Construction, Operational and decommissioning phases.

The impacts for which the mitigation/enhancement measures are proposed are numbered and referenced based on the section numbers in which they were identified in Chapter 6 of this report.

**Table 7-1: Proposed Mitigation Measures to potential impacts**

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
<b>MOBILIZATION PHASE</b>			
6.3.1(i)	Increased possibility for bush fire.	Indirect, long-term, adverse, local, irreversible and of moderate significance.	<ul style="list-style-type: none"> <li>i. Monitoring of right-of-way vegetation according to fire risk;</li> <li>ii. Removal of blow down and other high-hazard fuel accumulations;</li> <li>iii. Timing of thinning, slashing, and other maintenance activities to avoid seasons when the risk of forest fires is high;</li> <li>iv. Removal of maintenance slash or management by controlled burning;</li> <li>v. Controlled burning should adhere to applicable burning regulations; and</li> <li>vi. Fire suppression equipment requirements should be monitored by a fire watcher.</li> </ul>
6.3.1(ii)	Accidents to human, livestock, and small fauna from moving trucks and operating equipment	Indirect, Medium-term, adverse, and of moderate significance.	<ul style="list-style-type: none"> <li>i. Educate the local community about the risks of unauthorized entry to active project areas and implement a traffic safety training and awareness program for local residents, including children;</li> <li>ii. Conduct constant training programs of equipment operators and truck drivers on safety, health &amp; environmental aspects;</li> <li>iii. Discourage unauthorized entry to the project area through fencing or sign-posting on busy areas. This should be done in</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>close communication with the local community to minimize disruption to existing community movements;</p> <p>iv. Impose speed limits and construct bumps/road humps to reduce the speed of trucks near residential areas or settlements, and within the project site; and</p> <p>v. Ensure strict adherence to safety codes (and notably speed limits) on driving in the project area and residential areas to reduce the probability of having traffic accidents.</p>
6.3.1(iii)	Loss/disturbance of biodiversity and land degradation due to vegetation clearance	Direct, long-term, adverse, local, irreversible and of moderate significance.	<p>i. Minimize magnitude of clearance especially in areas of previous destruction by other projects;</p> <p>ii. During vegetation clearing and soil excavation top soil should be well managed and being spread to places with bare soil within the same vegetation as the contain seed bank of the native plant species;</p> <p>iii. Vegetation clearing machines such as tractors and excavators should be well cleaned and being disinfected before they brought into the project area to avoid introduction of pests from the previous places they have been working unless if they are completely new from the manufacture;</p> <p>iv. Ensure proper demarcation and delineation of the project area to be affected by any pre-construction works;</p> <p>v. Designate access routes and parking within the construction</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>sites; and</p> <p>vi. Design and implement an appropriate landscaping programme to help in re-vegetation of part of the project area after mobilization.</p>
6.3.1(iv)	Interference/destruction of fauna pathways or routes.	Direct, long-term, adverse, local, irreversible and of moderate significance.	<p>i. Confine pre-construction work within the acquired project areas;</p> <p>ii. Designate access routes and parking within the construction sites by considering animal corridor; and</p> <p>iii. To protect animals from entering the core project area a stock fence must be erected in project active areas.</p>
6.3.1(v)	Noise increase from traffic and machines/equipment.	Direct, temporally, low, local, irreversible and of moderate significance.	<p>i. All equipment and vehicles used in pre- construction works must be in good working condition, properly lubricated and maintained to keep noise within the permissible limits;</p> <p>ii. Routine maintenance of tracks and equipment (such as lubricate gears); and</p> <p>iii. Establish procedure for controlling noise along the road to and from the site.</p> <p>iv. Use low noise trucks where practicable mostly during crossing in the village center or populated areas; and</p> <p>v. Install noise suppression mechanisms e.g., exhaust mufflers on heavy vehicles and equipment and monitor their effectiveness.</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.1 (vi)	Visual alteration to the project area	Direct, long-term, adverse, local, irreversible and of moderate significance.	<ul style="list-style-type: none"> <li>i. Initiate a programme of reforestation (as far as possible with indigenous species) to the areas along the access roads, project area, populated areas. Trees will in the long-term mitigate a number of the visual/aesthetic impacts associated with the project development and serve as shelter for people, animals, and as potential flora stocks for regeneration of disturbed vegetation;</li> <li>ii. Avoid unnecessary cut down of trees during placement of containers and other equipment that will be used for construction;</li> <li>iii. The remains of unuseful structures that may have been erected at the project site shall be demolished and removed on completion of the project; and</li> <li>iv. Care must be taken to ensure that all rehabilitated areas are similar to the immediate environment in terms of visual character, vegetation cover and topography and any negative visual impacts will be rectified to the satisfaction of the official environmental consultant.</li> </ul>
6.3.1(vii)	Alteration of indigenous culture due to population increase.	Indirect, long-term, adverse, local, irreversible and of moderate significance.	<ul style="list-style-type: none"> <li>i. Awareness to the people regarding the existing cultural values and norms versus the impacts resulting from adapting new cultural values;</li> <li>ii. Community's sensitization around the project area must be taken into account before the commencement of the project;</li> </ul>



Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>and</p> <p>iii. Training the project workers to observe cultural values of the local community.</p>
6.3.1(viii)	Pollution of land and water resources from hydrocarbon spills.	Long term, adverse, reversible and of moderate significance.	<p>i. Conduct regular maintenance of all equipment and close monitoring of their movements as a way of minimizing discharges of hydrocarbons;</p> <p>ii. Properly maintain trucks, vehicles and moving machines to minimize fuel and oil leakage;</p> <p>iii. Use of fuels and lubricants should be confined to bunded areas with an impermeable layer to prevent soil contamination with appropriate oil separators for recycling of hydrocarbons;</p> <p>iv. Construct a well-built vehicle maintenance facility and fuel station, and a dirty water sump where fuel and oil spillages can be collected;</p> <p>v. Construct a diversion bund to direct clean runoff downstream from the maintenance facility;</p> <p>vi. Construct containment bunds within the maintenance facility to ensure that any hydrocarbon spillages drain to sumps before being collected and stored in containers or special tanks;</p> <p>vii. Ensure that, the collected and exhausted oils are reused/recycled or returned to suppliers for proper management; and</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			viii. Accidental hydrocarbon spillages from workshop and other places should be reported and recorded as incidents and cleaned up immediately.
6.3.1 (ix)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, Cholera and COVID-19	Indirect, short-term, diverse, local, reversible and of moderate significance	<ul style="list-style-type: none"> <li>i. Implementation of a health development plan including upgrading facilities and awareness campaigns regarding HIV/AIDS and sexually transmitted diseases (STD"s);</li> <li>ii. Maintain social distance at least 1m distance from one person to another, wearing masks and washing hand or use sanitizer more often;</li> <li>iii. Health education regarding HIV/AIDS and Covid19 prior the commencement of mobilization activities;</li> <li>iv. Use of sexual PPEs e.g. condoms;</li> <li>v. Encourage COVID Vaccines to workers;</li> <li>vi. Clear communication of all available employment positions to minimize population influx;</li> <li>vii. Gender-specific recruitment program to be initiated;</li> <li>viii. Proper sanitation in the campsite by ensuring adequate supply of clean water and sanitary facilities; and</li> <li>ix. Proper management of liquid waste (wastewater from sanitary facilities) and solid waste (food remains);</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.1 (xi)	Loss or inaccessible of medicinal plants by the community from the project site.	Indirect, short-term, diverse, local, reversible and of high significance	<ul style="list-style-type: none"> <li>i. Together with village government conduct detailed soil and medicinal plant analysis in order to establish the zones of medicinal plant outside the project area which will be managed by herbalist and village leaders; and</li> <li>ii. Efforts should be made to collect medicinal plant seeds and germinate them in order to obtain seedlings for replanting.</li> </ul>
6.3.1 (xii)	Air pollution from moving equipment and machinery in the site (dust, fugitive).	Direct, short-term, diverse, local, reversible and of moderate significance	<ul style="list-style-type: none"> <li>i. Adequate dust suppression measures such as regular water sprinkling at vulnerable areas of construction sites will be undertaken to control fugitive dust during material handling and transportation activities;</li> <li>ii. Implement measures aimed at binding the surface material or enhancing moisture preservation on access roads and community centers such as watering during the dry season; and</li> <li>iii. Working equipment on site should be equipped with dust collectors, in order to lessen dust emissions and workers must wear dust masks and ear mufflers.</li> </ul>
6.3.1 (xiii)	Disruption of wildlife corridor ( i.e Ugala River game reserve)due to vehicles movement and human activities	Direct, long-term, diverse, local, reversible and of high significance	<ul style="list-style-type: none"> <li>i. Ensure that laws governing protection of rare endemic and endangered species are enforced and abided by workers during mobilization phase;</li> <li>ii. Prepare and implement a Biodiversity Action Plan (BAP); and</li> <li>iii. Establish a department that shall ensure implementation, monitoring and evaluation within the footprint and neighbouring</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			areas.
6.3.1(xiv)	Displacement impact of people and their properties	Direct, long-term, diverse, local, irreversible and of moderate significance	<ul style="list-style-type: none"> <li>i. Resettlement Action Plan (RAP) will be prepared and it shall be observed;</li> <li>ii. Fairly, promptly and timely compensations shall be paid to all PAPs based on Tanzania laws and the World Bank OP/BP 4.12 on involuntary resettlement before commencement of the construction activities;</li> <li>iii. Compensation committee shall be established to deal with compensation issues;</li> <li>iv. The SGR designs shall try as much as possible to stick on the existing Railway reserve of 60m width;</li> <li>v. Conduct awareness to PAPs regarding displacement issues and the project in general; and</li> <li>vi. Grievance Redress Mechanism shall be put in place to resolve all project related grievances.</li> </ul>
<b>CONSTRUCTION PHASE</b>			
6.3.2 (i)	Pollution of land, surface and groundwater from oil spills/leakages and sewage contamination.	Indirect, long-term, adverse, local, irreversible and of high significance.	<ul style="list-style-type: none"> <li>i. In areas where spillage is likely, such as material storage areas, compounds, or maintenance yards, good housekeeping practices must be followed. This can easily be done by provision of Spill tanks and Secondary containment at vehicle maintenance yards;</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<ul style="list-style-type: none"> <li>ii. The collected hydrocarbons should be directed to a dedicated tank and disposed of through recycling by a used oils contractor;</li> <li>iii. Use of fuels and lubricants should be confined to bunded areas with an impervious layer to prevent soil contamination with appropriate oil separators for recycling of hydrocarbons;</li> <li>iv. The contractor should Plant grasses to minimize exposed soil surface area where necessary;</li> <li>v. The removal of suspended particles from surface water runoff using hay bales and silt barriers;</li> <li>vi. Silt curtains should be used to minimize sediment suspension and transport while working near water crossings; and</li> <li>vii. The Groundwater Management Plan will include management measures for pollution prevention, quality and quantity monitoring, as well as the implementation and maintenance of preventative and corrective measures.</li> </ul>
6.3.2 (ii)	Loss and/or disturbance of biodiversity due to vegetation clearance.	Direct, long-term, adverse, local, reversible and of moderate significance.	<ul style="list-style-type: none"> <li>i. Re-establish vegetation in some parts of the site through implementation of a well-designed landscaping programme by planting of appropriate plants;</li> <li>ii. Rip-off areas within and outside the site where compaction will have adversely affected to allow aeration of soil and ease infiltration of water into the soil;</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<ul style="list-style-type: none"> <li>iii. Ensure minimum vegetation clearance by clearing only those areas that are utilized for railway construction activities. A “permit to clear” procedure should be established in order to control and monitor vegetation clearance;</li> <li>iv. Movement of equipment, site personnel and workers should be closely monitored so as to minimize unauthorized activities in any part of the project area;</li> <li>v. Consult Forest Authorities to plant indigenous vegetation (grasses and trees) over a period of time on areas cleared during construction at the railway construction site and other structures;</li> <li>vi. Trees will also mitigate the generation of dust, serve as shelter for people and animals, and as potential flora stocks for regeneration of disturbed vegetation in adjacent areas and in order to restore the aesthetics value of the area; and</li> <li>vii. Conduct consultations with village leaders and livestock keepers in order to raise their awareness on the importance of conservation of biodiversity.</li> </ul>
6.3.2 (iii)	Deterioration of air quality due to dust, noxious gases and fugitive emissions from construction activities.	Direct, short-term, adverse, regional, irreversible, and of high significance.	<ul style="list-style-type: none"> <li>i. Indigenous tree species should be planted alongside roads and around buildings to prevent dust caused by heavy trucks from affecting humans, plants and wildlife;</li> <li>ii. Establish air quality monitoring stations throughout the project area by consulting an expert on air quality monitoring;</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<ul style="list-style-type: none"> <li>iii. Monitoring of air quality at regular intervals will be conducted;</li> <li>iv. Conduct regular inspection and certification system to make sure that exhaust gases comply with TBS/IFC or WB emission standards;</li> <li>v. Provide workers with nose mask in areas concentrated with exhaust emissions, dust and fumes covering the mouth and the nose; and goggles to protect the eyes;</li> <li>vi. Run and service/maintain machinery and vehicles regularly according to the manufacturer's instructions in order to ensure efficiency in working;</li> <li>vii. Use appropriate fuel that is free from adulteration and conduct research to identify and adopt usage of fuels that have minimum emissions of noxious gases;</li> <li>viii. Watering should be done to those places with significant dust levels and near the villages to prevent dust Pollutions;</li> <li>ix. Supervise activities at the site especially burning and sweeping;</li> <li>x. Regularly check or repair areas perceived to be sources of air pollution; and</li> <li>xi. Install protective fence for construction, reduce the influence of flying dust on surroundings.</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.2 (iv)	Increased sediment loads in the river and streams due to erosion of exposed surfaces.	Indirect, long-term, adverse, reversible and of Moderate significance.	<ul style="list-style-type: none"> <li>i. For areas where railway crossing Major River Like Malagarasi, the design of bridges and culverts is based on detailed studies and understanding of catchment characteristics and dynamics. The constructor should follow the design parameters and stated conditions for better protections of Rivers and streams;</li> <li>ii. To lessen the amount of sediment that enters receiving water bodies, by installing and maintain effective sediment control structures;</li> <li>iii. The vegetation fringing riverine forest both sides if not necessarily should not be cleared for biodiversity; conservation and protect the river banks from soil erosion</li> <li>iv. Surface water run-offs from workshops/garage, stores and other areas should be collected in a consigned pond that will be equipped with water separator; and</li> <li>v. Erosion should be prevented at disturbed areas through water diversion berms and proper stockpiling of soil.</li> </ul>
6.3.2 (v)	Traffic accidents involving pedestrians, livestock, and wildlife due to increased traffic in the project area during construction.	Direct, short-term, adverse, regional, reversible, and of high significance.	<ul style="list-style-type: none"> <li>i. Awareness programmes need to be implemented to highlight the importance of wildlife and general biodiversity to staff and contractors on the project site. The importance of biodiversity and penalties associated with unnecessary destruction need to be incorporated into site induction programmes;</li> <li>ii. Visible and Clear signs should be placed at construction sites in view of the public, warning people of potential dangers such as</li> </ul>



Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>moving vehicles, excavations etc., and raising awareness on safety issues;</p> <p>iii. Heavy machinery should not be used after day light and all such equipment should be returned to its overnight storage area/position before night;</p> <p>iv. Discourage site access by community through appropriate fencing;</p> <p>v. Where possible a traffic control and operation plan will be prepared together with the local traffic management authority prior to any construction and will be applied during project development; and</p> <p>vi. Speed limits need to be enforced within and beyond the project site for general animal safety.</p>
6.3.2 (vi)	Increase in noise from heavy machines (excavator, dozer trucks/vehicles,) generators and traffic.	Direct, short-term, adverse, regional, reversible, and of high significance.	<p>i. The movement of heavy vehicles roads will be restricted to between 6:00 a.m. and 18:00 p.m.;</p> <p>ii. Adequate route for large trucks will be selected to keep away from residential areas;</p> <p>iii. Traffic on the site and blowing of horns will be controlled and limited;</p> <p>iv. Construction sites will be monitored both regularly and irregularly by local environmental authorities or contracted environmental monitoring agency. If noise limits are exceeded,</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>equipment and construction conditions should be checked, and mitigation measures must be implemented to rectify the situation;</p> <ul style="list-style-type: none"> <li>v. Appropriate measures should be taken to protect workers' hearings while operating heavy equipment through provision of adequate and appropriate PPEs;</li> <li>vi. Equipment generating low levels of noise should be utilized as first priority;</li> <li>vii. Tracks/ vehicles and machinery should be properly maintained to minimize noise;</li> <li>viii. Noise reduction devices or methods (the use of temporary hoarding or noise barriers and vibration proof equipment) should be applied where possible. Noise from equipment and machinery will comply with Noise limits for Construction Site under as stipulated in TBS and WB guidelines; and</li> <li>ix. Noise should be regularly monitored at sensitive areas and community members must be consulted regularly.</li> </ul>
6.3.2 (vii)	Loss of aesthetics/visual of the area	Direct, Permanent, adverse, irreversible and of Moderate significance	<ul style="list-style-type: none"> <li>i. Initiate a programme of reforestation (as far as possible with indigenous species) to the area along the major access roads, populated areas. Trees will mitigate in the long-term a number of the visual/aesthetic impacts associated with the project development and serve as shelter for people, animals, and as potential flora stocks for regeneration of disturbed vegetation;</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<ul style="list-style-type: none"> <li>ii. Indigenous tree species should be planted alongside roads and around buildings to prevent dust caused by heavy trucks from affecting humans, plants and wildlife; and</li> <li>iii. Care must be taken to ensure that all rehabilitated areas are similar to the immediate environment in terms of visual character, vegetation cover and topography and any negative visual impacts will be rectified to the satisfaction of the official environmental consultant.</li> </ul>
6.3.2 (viii)	Increase of vectors and pests diseases	Indirect, short-term, adverse, local, irreversible, and of high significance	<ul style="list-style-type: none"> <li>i. Fumigation should be periodically conducted to control vectors and pest invasions by using insecticides and ensuring no stagnant water or ponds by constructing adequate engineered drainage systems within the project area; and</li> <li>ii. Wear light- colored, long-sleeved shirts and long trousers, tucked into socks or boots, and use insect repellent on exposed skin and clothing to protect from mosquitoes, sandflies or ticks.</li> </ul>
6.3.2 (ix)	Health impacts to workers due to the presence of noise, fumes, and accidents.	Indirect, Long-term, adverse, irreversible and of high significance.	<ul style="list-style-type: none"> <li>i. Garbage receptacles will be setup at construction site and camps will be periodically cleared to prevent outbreak of diseases;</li> <li>ii. Provide personal protection equipment (PPEs), such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection, in accordance with relevant health and safety regulations for workers;</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<ul style="list-style-type: none"> <li>iii. An emergency response plan to take actions on accidents and emergencies, including environmental and public health emergencies associated with hazardous material spills and similar events will be prepared. Emergency phone link with hospitals in the affected Districts will be established. A fully equipped first-aid base in each construction camp will be organized;</li> <li>iv. Provide a clean and sufficient supply of fresh water for workers and visitors and nearby communities; and</li> <li>v. Provide an adequate number of latrines and other sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained.</li> </ul>
6.3.2 (x)	Interference with the drainage systems due to construction activities that might led to topographic changes and affect the natural flow of water within the project area.	Direct, Long-term, adverse, irreversible and of High significance.	<ul style="list-style-type: none"> <li>i. Provide alternative water supplies for the local communities to compensate for any water sources adversely affected by the project. For example, provide deep water boreholes for the village or connect them with underground water pipes; and</li> <li>ii. Undertake on-going consultation with local residents regarding potential impacts related to the project, and associated mitigation measures.</li> </ul>
6.3.2 (xi)	Waste generation both normal waste and hazardous waste i.e. timber, electrical waste,	Direct, long-term, adverse, local,	<ul style="list-style-type: none"> <li>i. Adhere to Environmental Management (Hazardous Waste Control and Management) Regulations, 2021</li> <li>ii. Adequate number of waste bins shall be provided at the</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
	Solid waste containers of paint, domestic Waste, Oils, scraps metals etc.	irreversible and of moderate significance.	<p>construction site;</p> <p>iii. Only inert materials or readily decomposable materials shall be disposed of by burial;</p> <p>iv. ensure that the potential for the spillage or loss of hazardous materials that could cause adverse impacts on groundwater or the environment, or compromise the health and safety of workers and the public are minimized to the extent possible;</p> <p>v. Recycling of e-waste and scrap metal to reduce their quantity to the environment; and</p> <p>vi. Recycling of used plastics and containers.</p>
6.3.2 (xii)	Loss of indigenous /threatened flora and fauna species	Direct, long-term, adverse, local, irreversible and of moderate significance.	<p>i. Unnecessary tree cutting should be well minimized and gas should be used as a source of energy in camp sites for cooking to minimize tree felling;</p> <p>ii. Vegetation clearing machines such as tractors and excavators should be well cleaned and being disinfected before they brought into the project area to avoid introduction of invasive plant species and pests from the previous places they have been working unless if they are completely new from the manufacture;</p> <p>iii. Ensure that laws governing protection of rare endemic and endangered species are enforced and abided by;</p> <p>iv. Ensure habitat restoration throughout the project footprint;</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>and</p> <p>v. Construct under-paths in wildlife corridors and other area. Because the area is widespread covering a distance of 416.6 km (Tabora to the village in Kigoma) with intense human activities, it is proposed that under-paths be constructed after each 5km to allow free movement of wildlife, livestock and human.</p>
6.3.2 (xiii)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.	Indirect, long-term, adverse, local, irreversible and of high significance	<p>i. Since construction of Railway will attract many job seekers and trade mongers, the contractor shall prepare and enforce a Code of Ethical Conduct (CEC); in the camp to encourage respect for the local community and to maintain cleanliness of the camp at all times;</p> <p>ii. The contractor for railway construction shall prepare an HIV/AIDS Awareness Campaign Plan to reduce risks of spreading of HIV/AIDS and other STDs. The contractor shall also identify a registered service provider. Both, the plan and procurement of service provider shall be subject to the approval of the client and the Bank;</p> <p>iii. A safety, health and environment induction course shall be conducted to all workers, putting more emphasis on HIV/AIDS and COVID-19 which has become a national disaster;</p> <p>iv. In order to prevent more HIV/AIDS infection and COVID-19, during the construction phase, the project should include</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>information, education and communication component (IEC) in its budget. This will help to raise more awareness on HIV/AIDS/COVID-19, and means to suppress their incidence;</p> <ul style="list-style-type: none"> <li>v. Promotion of awareness campaigns on HIV/AIDS/COVID-19 for both workforce and local people, including information about sexual health and rights and vaccination respectively. The project should engage an NGO to assist in the implementation of HIV/AIDS/COVID-19 awareness workshops throughout the life of the project;</li> <li>vi. Access to Workforce Camps by outsiders to be controlled; and</li> <li>vii. Contractor to provide standard quality condoms and mass sanitizer to personnel on site.</li> </ul>
6.3.2 (xiv)	Unstable slopes and increased potential for landslides	Direct, long-term, diverse, local, irreversible and of high significance	<ul style="list-style-type: none"> <li>i. The communities surrounding the project should be educated on the potential hazards and how to mitigate the risks associated with landslides;</li> <li>ii. Emergency response plans should be developed and regularly tested to ensure a timely response in the event of a landslide;</li> <li>iii. Adequate slope stabilization measures, such as drainage systems, retaining walls, and slope regrading, should be put in place to manage the risk of landslides and slope failure. It is also essential to develop a safety plan and provide adequate training to workers to ensure their safety while working on</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>unstable slopes;</p> <p>iv. Ensure provision of adequate and appropriate protective gears to workers and visitors;</p> <p>v. The construction area should be well located or demarcated to avoid accidents; and</p> <p>vi. The project needs to conduct a detailed geotechnical survey to identify areas of potential instability throughout the SGR line. Appropriate mitigation measures should be put in place, such as slope stabilization, drainage control, and vegetation management.</p>
6.3.2 (xv)	Damage to or alternation of wetland areas	Direct, long-term, diverse, reversible and of high significance	<p>i. Stabilization and protection of the upper catchment through: enrichment tree planting and establishment of soil erosion control structures (terraces and cut-off drains);</p> <p>ii. Sensitization of the local communities and complete eradication of cultivation and grazing at the wetland area;</p> <p>iii. Prepare and implement livelihood restoration plans based on forest conservation that benefit communities;</p> <p>iv. Prepare and implement a Biodiversity Action Plan (BAP);</p> <p>v. Ensure habitat restoration throughout the project footprint; and</p> <p>vi. Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites.</p>



Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.2 (xvi)	Risk of increased spread of Invasive Alien Species Infestation	Direct, short-term, diverse, reversible and of high significance	<ul style="list-style-type: none"> <li>i. Identify section affected by invasive species;</li> <li>ii. Prepare invasive species eradication plan in collaboration with experts;</li> <li>iii. Screen sources of construction materials by identifying all organism on identified sources;</li> <li>iv. Dispose spoil material to designated site; and</li> <li>v. Mechanical removal invasive species in all areas encountered.</li> </ul>
6.3.2 (xvii)	Risk of Interference with the wildlife corridors	Direct, long-term, diverse, irreversible and of high significance	<ul style="list-style-type: none"> <li>i. The project developer should liaise with the forest department of Kigoma and Tabora Regions for establishment of tree nurseries of fast growing indigenous tree species and support conservation activities such as tree planting programs to mitigate the amount of woody which will be cleared for the project activities; and</li> <li>ii. Ensure that laws governing protection of rare endemic and endangered species are enforced and abided by workers during construction phase.</li> </ul>
6.3.2 (xviii)	Soil Erosion	Direct, short-term, adverse, and of high significance.	<ul style="list-style-type: none"> <li>i. The contractor should plant grass or any other vegetation cover to minimize exposed soil surface;</li> <li>ii. Suitable grading to enhance sheet flow and reduce flow concentration on unconsolidated soil;</li> <li>iii. Directing flow to properly designated channels;</li> <li>iv. Lined drainage channels at sensitive terrains shall be</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>constructed to control speed and volumes of storm-water. The discharge points must be carefully chosen to avoid erosion of arable land and creation of valleys;</p> <p>v. Unnecessary land clearance and sensitive re-alignments shall be avoided; and</p> <p>vi. Allowable tonnage only should pass in the access roads.</p>
<b>OPERATION PHASE</b>			
6.3.3 (i)	Increased pressure on resources (water, forest, wildlife and land	Indirect, long-term, adverse, local, irreversible and of moderate significance	<p>i. Increased forest and wildlife personnel so as to ensure proper management of the forests and wildlife areas;</p> <p>ii. Increased capacity building of the land and natural resources Departments in all Affected Districts;</p> <p>iii. Increased control and enforcement on forest and game products;</p> <p>iv. Promote alternative energy sources such as solar power;</p> <p>v. Promote afforestation activities through existing NGOs;</p> <p>vi. During construction and operating phase, the use of fuel wood as the major source of energy in worker's camps should be discouraged instead an alternative energy should be used such as electricity and Gas;</p> <p>vii. Security should be enforced within the project area to prevent</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>hunting activities;</p> <p>viii. Fauna conservation programs and trainings will be administered to the surrounding communities and project workers; and</p> <p>ix. Workers should be made aware of the importance of maintaining the biodiversity of the greater project area;</p>
6.3.3 (ii)	Increased Accidents	Medium-term, adverse, and of high significance.	<p>Electrified SGR design shall take into account safety concerns especially at human habitation crossings e.g. installation of train stops at settlement centers including:</p> <p>i. Traffic management plan shall be incorporated in the designs to include for example details of signs, markings, intersection layouts, access restrictions, train stops, crossings and footpaths;</p> <p>ii. The traffic management plans shall be presented both in English and Kiswahili; and</p> <p>iii. Training to the local community on the awareness of Rapid Train and safety precautions.</p>
6.3.3 (iii)	Increased Theft on the track rails to use as scrap Metals	Indirect, medium-term, adverse, reversible and of Moderate significance	<p>i. Improve security of the affected villages through cooperation with the village councils or leaders by involving them in plans;</p> <p>ii. Cooperate with the security enforcing agencies, i.e., Police force, to establish a police post near the project site to deal with thieves;</p> <p>iii. Employ locals, where security education, skills and experience</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>allow and provide training on security aspects;</p> <p>iv. Regularly meet with local authorities and implement on-going consultation with the local community to discuss aspects of security in the area and identify areas in which the local security guards (Sungusungu “Mgambo”) become involved and motivated; and</p> <p>v. Establish a system of monitoring security performance including its personnel to screen out incompetent and unfaithful security guards.</p>
6.3.3 (iv)	Impact on Noise and vibration	Direct, long-term, adverse, and of moderate significance	<p>i. The effects of vibrations will continuously be monitored to ensure legally compliant ground levels, specifically related to the impacts on wildlife;</p> <p>ii. TRC should adhere to the Environmental Management (standards for the control of noise and vibration pollution) Regulations, 2015;</p> <p>iii. Implementation of Vibration and noise Management plan; and</p> <p>iv. The new tracks should be built using continuous rails rather than jointed rails making a smoother path for passing trains and reducing noise and vibration.</p>
6.3.3 (v)	Disruption of wildlife movement and migration	Direct, Long term, adverse and of high significant.	<p>i. Where there is wildlife corridor, Tunnels have to be designed from Design phase which will help to facilitate safe movement of wildlife across the Railways. Appropriate designing and planning can go a long way in preventing long-term</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>degradation of wildlife populations and the ecosystems in operation phase; and</p> <p>ii. Monitoring should be done to evaluate the effectiveness of wildlife crossing structures to avoid failure.</p>
6.3.3 (vi)	Reduced Carbon Emissions		<p>i. Encourage the use of carbon storing such as bioplastic materials for mitigating minimum emissions from service cars;</p> <p>ii. Discourage the use of wood as the major source of energy in worker's camp during operating phase instead, encourage the use of an alternative energy such as electricity and Gas; and</p> <p>iii. Limit/reduce the use of energy from carbon emitting equipment associated with SGR project such as service vehicles and Generators.</p>
6.3.3 (vii)	Impact on community health and safety	Indirect, long-term, adverse, local, irreversible and of moderate significance.	<p>i. Provide a clean and sufficient supply of fresh water for workers and visitors and nearby communities;</p> <p>ii. Provide an adequate number of latrines and other sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained to avoid outbreak of diseases to the local community; and</p> <p>iii. Adequate number of labelled waste bins shall be provided at each stations.</p>
6.3.3 (viii)	Visual Impact	Indirect, long-term, adverse, local,	<p>i. Initiate a programme of reforestation (as far as possible with indigenous species) to the area along the access roads and</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
		irreversible and of moderate significance.	<ul style="list-style-type: none"> <li>project area;</li> <li>ii. Insist workers to avoid unnecessary cut down of trees during all project phases;</li> <li>iii. The remains of un-useful structures that may have been erected at the project site shall be demolished and removed; and</li> <li>iv. Care must be taken to ensure that all rehabilitated areas are similar to the immediate environment in terms of visual character, vegetation cover and topography and any negative visual impacts will be rectified to the satisfaction of the official environmental consultant.</li> </ul>
6.3.3 (ix)	Trade Facilitation	Direct, Long -term, beneficial, reversible and of high significance	<ul style="list-style-type: none"> <li>i. Government should charge fairly and affordable tax and good tax collection mechanisms;</li> <li>ii. Reasonable railway transportation cost;</li> <li>iii. Prevent thief and improve security of railway structure and facilities to increase customers;</li> <li>iv. Promote availability of markets for their goods;</li> <li>v. Buying food from local vendors; and</li> <li>vi. Government should Promote investments to local entrepreneurs by providing loans.</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.3 (x)	Enhancement economic growth	Direct, short-term, reversible and of moderate significance	<ul style="list-style-type: none"> <li>i. Make sure the railway line is routinely maintained;</li> <li>ii. Government should organize well the institution for management of railway;</li> <li>iii. Ensure security to the passengers and Cargo;</li> <li>iv. Promote the use of train over Buses for cargo transportation;</li> <li>v. Timely maintenance of railway line; and</li> <li>vi. TANESCO shall ensure availability of electricity during.</li> </ul>
6.3.3 (xi)	Conflict/competition over employment opportunities between newcomers and locals	Direct/Indirect, long-term, adverse, reversible and of High significance	<ul style="list-style-type: none"> <li>i. Clear instructions regarding appropriate rules of interaction with local community members must be provided to project employees, whether they are on the job or not;</li> <li>ii. Employ locals, where education, skills and experience allow, and provide training; and</li> <li>iii. Regularly, meet with local authorities to discuss project developments, community issues.</li> </ul>
6.3.3 (xii)	Pollution of surface and groundwater from sewage contamination and oils/fuels	Indirect, long-term, adverse, irreversible and of low significance	<ul style="list-style-type: none"> <li>i. Conduct inspection of oil leakages from service vehicle, service yards or other trucks operating at the roads near the project area;</li> <li>ii. Provide an adequate number of latrines and other sanitary arrangements at the camps and railway stations, and ensure that they are cleaned and maintained; and</li> <li>iii. Establish water monitoring stations around project areas,</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			measure Fecal coliforms to ensure safe use of domestic water.
6.3.3 (xiii)	Insecurity as a result of population influx	Indirect, medium-term, adverse, reversible and of Moderate significance	<ul style="list-style-type: none"> <li>i. Establish a system of monitoring security performance including its personnel to screen out incompetent and unfaithful security guards;</li> <li>ii. Regularly meet with local authorities and implement on-going consultation with the local community to discuss aspects of security in the area and identify areas in which the local security guards (Sungusungu “Mgambo”) become involved and motivated;</li> <li>iii. Cooperate with the security enforcing agencies, i.e., Police force, to establish a police post near the project site;</li> <li>iv. Employ locals, where security education, skills and experience allow and provide training on security aspects; and</li> <li>v. Improve security of the villages nearby through cooperation with the village councils or leaderships by involving them in plans.</li> </ul>
6.3.3 (xiv)	Risk for malaria from mosquitos breeding ponds and borrow pits	Indirect, medium-term, adverse, reversible and of Moderate significance.	<ul style="list-style-type: none"> <li>i. Fill with rocky materials any quarried areas and ponds that store storm waters to prevent mosquito larvae from breeding;</li> <li>ii. Security workers should be provided with long-sleeved shirts and long trousers, tucked into socks or boots, and use insect repellent on exposed skin to protect them from] mosquitoes, sand flies or ticks;</li> <li>iii. Regularly conduct fumigation to control vectors and pest</li> </ul>



Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			<p>diseases by using insecticides and ensuring no standing water or ponds by constructing adequate engineered drainage systems within the project area;</p> <p>iv. Plan and implement a malaria awareness and preventive programme for communities living near the project area; and</p> <p>v. Ensure monitoring of flies'/ mosquitoes densities are regularly conducted.</p>
6.3.3 (xv)	Deterioration of culture and moral values	Direct, long-term, adverse, irreversible and of High significance	<p>i. Training the project workers to obey cultural values of the existing community surrounding project area;</p> <p>ii. Awareness creation on the existing cultural values and norms and the impacts resulting from adapting new cultural values; and</p> <p>iii. Awareness creation on the impacts resulting from early marriages.</p>
6.3.3 (xvi)	Violation of children rights by project developer and child labour force on site.	Direct, long-term, adverse, irreversible and of High significance	<p>i. Develop and implement Children Protection Strategy that will ensure minors are protected against negative impacts associated by the project.;</p> <p>ii. Children under the age of 18 years shall not be hired on site as provided by Employment and Labor Relations Act, 2004 Part II Sub-Part A Child Labor;</p> <p>iii. Unaccompanied children should not be invited to workers' home, unless they are at immediate risk of injury or in</p>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
			physical danger; iv. Refrain from physical punishment or discipline of children; v. Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury; and vi. Comply with all relevant local legislation, including labor laws in relation to child labor.
6.3.3 (xvii)	Family or Marriage fragmentation	Indirect, medium-term, adverse, reversible and of Moderate significance.	i. Community sensitization be taken into account before the commencement of the project; ii. Training the project workers to obey cultural values of the existing community surrounding project area; and iii. Awareness creation regarding the impact of sexual transmitted diseases i.e., HIV and AIDS.
6.3.3 (xviii)	Environmental pollution from waste materials	Direct, long-term, adverse, irreversible and of High significance	i. Proper management and disposal of the different types of solid wastes; and ii. Set garbage collection device and collected by environmental sanitation department and must be transported to the designated landfill.

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.3 (xix)	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.	Direct, long-term, adverse, irreversible and of High significance	<ul style="list-style-type: none"> <li>i. Implementation of a health development plan including upgrading facilities and awareness campaigns regarding HIV/AIDS and sexually transmitted diseases (STD"s);</li> <li>ii. Maintain social distance at least 1m distance from one person to another, wearing masks and washing hand or use sanitizer more often;</li> <li>iii. Health education regarding HIV/AIDS and Covid19 prior the commencement of exploration activities;</li> <li>iv. Use of sexual PPEs e.g. condoms;</li> <li>v. Encourage COVID Vaccines to workers;</li> <li>vi. Proper sanitation in the campsite by ensuring adequate supply of clean water and sanitary facilities; and</li> <li>vii. Proper management of liquid waste (wastewater from sanitary facilities) and solid waste (food remains).</li> </ul>
<b>DECOMMISSIONING PHASE</b>			
6.3.4(i)	Accidents to animals and people due to demolition works.	Direct, Long-term, adverse, irreversible and of High significance	<ul style="list-style-type: none"> <li>i. Use experienced and well-trained people for demolition works;</li> <li>ii. Ensure proper management and supervision of all demolition works; and</li> <li>iii. Prepare safety procedures for each demolition operation to ensure safety to workers and local residents;</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.4(ii)	Air pollution from demolition activities.	Direct, short-term, adverse reversible and of moderate significance.	<ul style="list-style-type: none"> <li>i. Conduct regular maintenance of all equipment as a way of reducing emissions of noxious gases;</li> <li>ii. Monitoring of air quality should be done during and after demolition works by using integrated air quality equipment;</li> <li>iii. Implementation of air quality management plan; and</li> <li>iv. Wearing of PPEs to the workers such as dust mask during demolition works.</li> </ul>
6.3.4(iii)	Pollution from solid and liquid waste generation	Direct, long-term, adverse irreversible and of moderate significance.	<ul style="list-style-type: none"> <li>i. Utilization of portable toilets or soak-away/septic tank treatment systems (where appropriate) in worker camps and job sites;</li> <li>ii. Establishing one's own treatment system or connecting to an existing municipal liquid waste system in big cities and towns;</li> <li>iii. In remote areas, use soak away/septic tanks techniques for wastewater treatment;</li> <li>iv. Provide adequate and labelled waste bins at work place;</li> <li>v. Sorting and properly disposing of solid garbage;</li> <li>vi. Training to workers, railway staffs and train passengers on health, environmental and safety issues; and</li> <li>vii. Reclaim depleted borrow pits and quarry sites using overburden soil removed during constructions to prevent litter of solid wastes to them.</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.4(iv)	Unemployment	Direct, medium-term, adverse, reversible and of High significance	<ul style="list-style-type: none"> <li>i. In consultation with the village council, initiate alternative sustainable economic activities in the area that will improve villagers' livelihood i.e. horticulture, train them on security skills (mgambo) so they can seek alternative employment;</li> <li>ii. Ensure that all employees have coverage of a pension scheme, e.g., through the National Social Security Fund (NSSF) and that the due contributions are made;</li> <li>iii. Consider transferring the employees to ongoing projects so that the training and experiences gained are continually utilized;</li> <li>iv. Develop training and capacity-building programmes that would prepare employees to be employed in other projects after decommissioning of the railway project; and</li> <li>v. Develop entrepreneurship-training programmes that will enable employees to seek self-employment at the end of the project.</li> </ul>
6.3.4(v)	Inconveniences to pensioners related to pension funds failure to pay retrenched workers in time	Direct, short-term, adverse, reversible and of moderate significance	<ul style="list-style-type: none"> <li>- Make sure that timely contributions are made and that all employees are covered by a pension plan, such as the National Social Security Fund.</li> </ul>

Impact Reference No.	Mode of the Impact	Classification of the Impact	Proposed Mitigation /Enhancement measures
6.3.4(vi)	Decreased income for the local communities	Direct, medium-term, adverse, reversible and of High significance	<ul style="list-style-type: none"> <li>i. Establish agricultural market and training to the locals on modern agriculture methods;</li> <li>ii. Local partners should be supported to diversify economy and decrease dependence on the project;</li> <li>iii. Develop training and capacity-building programmes that would prepare employees to be employed in other projects after decommissioning of the Nachu Graphite processing plant project; and</li> <li>iv. Develop entrepreneurship-training programmes that will enable employees to seek self-employment at the end of the project.</li> </ul>
6.3.4 (vii)	Safety and Security Impacts	Direct, medium-term, adverse, reversible and of High significance	<ul style="list-style-type: none"> <li>i. The project campsite and railway line/stations be secured by security guards arranged by the project authorities;</li> <li>ii. Security Company will be hired during project phase decommissioning phase; and</li> <li>iii. Fire-fighting equipment will be installed within the relevant areas/components to contain fire incidences. The system will comprise the following components a) Fire detection system b) Fire Hydrant System and c) Portable Fire Extinguishers.</li> </ul>

## **8 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

### **8.1 INTRODUCTION**

The Environmental and Social Management Plan (ESMP) for the proposed SGR project has been conducted in accordance with Tanzania general environmental impact assessment guidelines and steps set out in the Fourth Schedule made under Regulation 15 i.e. compiled in line with the requirements of the Environmental Management Act, 2004, the Environmental Impact Assessment and Audit Regulations 2005 and its amendments of 2018. This ESMP is a part of ESIA process purposely planned to prevent, eliminate or reduce adverse environmental and social impacts likely to associate with proposed project to an acceptable level. It provides measures for combating /eliminating and reducing the negative impacts to an acceptable level as per national and international guidelines and requirement and enhancing /maintain the positive ones. In this case the ESMP is to be used as a tool for the proponent for managing the predicted impacts related to the project during its life cycle, namely mobilisation (preparation), construction, operational and decommissioning (closure) phases.

The key objectives associated with this ESMP are:

- i. Maximise the positive impacts associated with standard gauge railway project, specifically relating to the socio-economic aspects of the area within the railway corridor;
- ii. Minimise and manage all negative environmental and socio-economic related impacts associated with the project on a continual basis;
- iii. Reduce the impacts on air quality through proper design and maintenance of railway and its associated infrastructures such as access roads and workshops and use of the appropriate fuels in this infrastructures;
- iv. Quantify the impacts associated with the railways transportation through proper monitoring of the air quality and water quality, as well as the impact of noise and vibration especially at the stations; and
- v. Implement an ongoing rehabilitation plan to reduce the residual impact associated with the railway activities.

### **8.2 PERSONNEL RESPONSIBLE FOR THE IMPLEMENTATION OF THE ESMP**

The General Manager (GM) of the Tanzania Railway Corporation (TRC) will be responsible for ensuring implementation of the ESMP. The GM will also ensure that a procedure is developed such that all senior positions on site have their environmental responsibilities and accountabilities clearly outlined. These descriptions will form part of the contractual obligations upon which individual employees are engaged. Specific accountabilities and responsibilities outlined in the procedures will be communicated through the General Manager or Heads of Departments.

The TRC will also establish a dedicated Environmental Department that will provide technical support and coordinate environmental management initiatives. The Department will be comprised of an Environmental, Health and Safety (HSE) Manager (EHS Manager) who shall

report directly to the General Manager of the company. The HSE Manager will be supported by Environmental Officers and Technicians. The company will be committed to ensuring that HSE Departmental staff members are appropriately qualified for undertaking their assigned responsibilities effectively. In order to fulfil the above requirement, the company shall recruit competent individuals and put in place a training program.

Typical duties and responsibilities for the HSE team members will include:

- i. Make sure that environmental monitoring programs are carried out on schedule and correctly;
- ii. Develop and implement restoration of disturbed areas and implement re-vegetation efforts;
- iii. Undertake on-going awareness raising and training with local communities on issues related to the environment, biodiversity, processing plant and traffic related health and safety;
- iv. Provide technical environmental support to standard railway issues;
- v. Ensure commitments listed in the EIS are met;
- vi. Review (periodically) the existing monitoring system and design updated systems if and when required;
- vii. Establish, train and ensure readiness of the emergency response teams (i.e., spill related);
- viii. Report on environmental data and incidents of significance as per Tanzanian regulations and International guidelines;
- ix. Liaise with the appropriate regulatory authorities on environmental issues and compliance, and any incidences with environmental risks;
- x. Collect environmental data as per the ESMP;
- xi. Review environmental data and recommend appropriate actions;
- xii. Monitor environmental compliance of project operations; and
- xiii. Train others in the team and general personnel on the project environmental issues.

### **8.3 THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANING**

In consideration of the nature of the area and the general environmental management requirements associated with the planned standard railway gauge (SGR) starting with the previous lots and related activities, this ESMP has been categorised in the following groups:

- i. Soils and Land Management and Rehabilitation Plan;
- ii. Surface and Groundwater Management Plan;
- iii. Waste Management Plan;
- iv. Biodiversity Management Plan;
- v. Air Quality Management Plan;
- vi. Noise and Vibration Management Plan;



- vii. Aesthetics and Visual Impacts Management Plan;
- viii. Health and Safety Management Plan;
- ix. Socio-Economic Management Plan and Recruitment Policy; and
- x. Public Disclosure Plan.

### **8.3.1 Soils, Land Management and Rehabilitation Plan**

The objectives for Soils, Land Management and Rehabilitation Plan are:

- i. Rehabilitate all exposed areas as soon as the activity causing the disturbance has ceased, to as far as possible the natural condition;
- ii. Minimize land disturbance through utilization of a “permit to disturb” and “maintenance of disturbed land” register;
- iii. Implement soil erosion control measures and management in a proactive and diligent manner;
- iv. Rehabilitate all disturbed areas through a continuous rehabilitation program; and
- v. Rehabilitate all borrow pits developed during construction activities.

**Table 8-1: Soils, Land Management and Rehabilitation Plan**

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Site clearance for railway haul/ access roads and the supporting infrastructures	<p>Land degradation, Loss of biodiversity, Erosion and siltation Increased possibility for bush fire. Pollution of land and water resources from hydrocarbon spills.</p> <p>Land Expropriation, Loss of Property and Resettlement</p> <p>Alteration in land values</p>	Preparation, Construction & Operation	<p>i. During vegetation clearing and soil excavation top soil should be well managed and being spread to places with bare soil within the same vegetation as the contain seed bank of the native plant species;</p> <p>ii. Unnecessary tree cutting should be well minimized and gas should be used as a source of energy in camp sites for cooking to minimize tree felling;</p> <p>iii. TRC should liaise with the forest department of Kigoma and Tabora regions for establishment of tree nurseries of fast growing indigenous tree species and support conservation activities such as tree planting programs to mitigate the amount of woody which will be cleared for the project activities;</p> <p>iv. Movement of equipment and personnel will be restricted to within paved or compacted areas only;</p>	TRC Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	20,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<ul style="list-style-type: none"> <li>v. All stripped top soil will be stockpiled and stabilized for use during rehabilitation;</li> <li>vi. Indigenous plants will be collected and used in rehabilitation;</li> <li>vii. A rehabilitation plan for the project will be developed and implemented on a continuous basis, from the start of construction through to post-closure;</li> <li>viii. Run-off control system will be constructed around crucial infrastructures and provided with silt traps;</li> <li>ix. Clearance of vegetation shall only be done on which construction is to take place;</li> <li>x. Top soil will be stored separately and will be used for greenbelt within the site;</li> <li>xi. Landscape will be developed within site;</li> <li>xii. Maintenance of machinery be limited to paved surface to reduce land and water pollution through spills; and</li> </ul>			

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			xiii. Resettlement action plan will be incorporated in acquiring land and compensation will be fair and prompt.			
Rehabilitation of access road, construction & maintenance of project area roads, & infrastructures	Land degradation Erosion, siltation Loss of aesthetics/visual environment and Dust generation Solid waste mismanagement	Preparation, Construction & Operation	<ul style="list-style-type: none"> <li>Materials storage sites will be located about 300m from residential areas;</li> <li>The material in the storage sites will be organized, such as separate stone and sand materials; store concrete in separate storage place and reduce the on-site storage time of the construction</li> <li>Vehicle emissions will comply with Limits and Measurement Methods for Emissions from Light-duty Vehicles.</li> <li>No vehicle that emits black smoke will be allowed to operate on-site</li> <li>Run-off control systems and silt traps will be constructed in construction area such as station and workshops.</li> <li>All excavations will be backfilled, leveled, contoured and re-vegetated.</li> </ul>	TRC Environmental, Health and Safety (EHS) Manager	Appropriate project phases	40,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<ul style="list-style-type: none"> <li>All access and haulage roads will be sprayed with water on an as needed basis so as to minimize impacts from dust.</li> <li>Prohibit burning of waste; multi-compartment collection bins will be installed to facilitate reuse, recycle of solid wastes.</li> </ul>			
Haulage of Construction materials to the construction site	Erosion and siltation and Deterioration of air quality	Operations	<p>All road shoulders will be re-vegetated to control erosion.</p> <p>All drains will be diverted away from the course of the water bodies downstream.</p> <p>All roads will be sprayed with water to control dust emissions.</p> <p>Equipment will be regularly maintained and monitored.</p>	TRC (EHS) Manager Engineering Manager	Throughout the project cycle	10,000

### **8.3.2 Surface and Groundwater Management Plan**

The proposed SGR project will involve clearance of vegetation to pave the way for construction of railway. The quality of the storm water generated is also expected to decrease due to the nature of the activities as water sources depend as much on vegetation especially where the railway crossing water source like Malagarasi basin.

A surface and groundwater management plan will be established and effected, with one major objective being to ensure that all clean and dirty water producing areas are identified and managed properly; thus, minimizing any impacts on existing surface water resources such as streams and rivers within the railway corridor.

Another major objective of the surface water and ground water management plan is to safeguard water resources from pollution by dirty water. All dirty water or substances which cause or are likely to cause pollution of a water resource, either through natural flow or by seepage, must be managed properly to protect these water resources from contamination with dirty water such as water from the workshops, haul and access roads and railway stations.

**Table 8-2: Surface and Groundwater Management Plan**

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Construction and rehabilitation of site access roads and associated railway infrastructures	<p>Interference with natural drainage system</p> <p>Pollution of land, surface and groundwater from oil spills/leakages and sewage contamination.</p> <p>Increased sediment loads in the river and streams due to erosion of exposed surfaces</p>	Construction	<p>i. Regular maintenance of all equipment and close monitoring of their movements as a way of minimizing discharges of hydrocarbons in the area will be ensured;</p> <p>ii. Strengthened management on point and nonpoint source pollution around river or streams and ensure no discharge of untreated wastewater to the water sources;</p> <p>iii. Sites for the location of haul and access roads and other infrastructures will be selected carefully in order to minimize interference with natural drainage systems;</p> <p>iv. All equipment will be maintained regularly and vehicle movements monitored;</p> <p>v. Use erosion control mats and construct raised exit pads made of crushed rock. To minimise</p>	<p>Construction Manager</p> <p>Environmental, Health and Safety (EHS) Manager</p>	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<p>the amount of sediments that leaves the site; and</p> <p>vi. Use barriers such as sediment fences or filter strips to trap sediment before it can wash away into down streams and rivers.</p>			
Increased Water Consumption/D emands	<p>Draw- down of water sources/table</p> <p>Disappearance /loss of aquatic organisms</p>	Construction and Operation	<p>i. Water conservation practice shall be done by recycling of treated water in plant premises to reduce water demand as well as to conserve natural resources; and</p> <p>ii. Magnetic flow meters shall be installed at each of raw water consumption point.</p>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000
Storm water runoff	<p>Potential for pollution</p> <p>Downstream flooding</p> <p>Channel erosion and siltation</p>	Construction & Operations	<p>i. Monitor sediment accumulation in the River or any streams, perform periodic dredging if necessary; and</p> <p>ii. Soil erosion will be controlled by tree plantation.</p>	<p>Environmental, Health and Safety (EHS) Manager</p> <p>Plant Manager</p>	Throughout the project life (phases)	10,000



Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	Interference with the drainage systems due to construction activities that might led to topographic changes and affect the natural flow of water within the project area.			Construction Manager		
Wastewater management	Potential for contamination of surface and groundwater		<ul style="list-style-type: none"> <li>i. The effluent generation from every railway station shall be treated to avoid impact on surface water quality; and</li> <li>ii. Use of spill control measures, mechanical handling, PPEs shall be mandatory.</li> </ul>	Environmental, Health and Safety (EHS) Manager  Station Manager	Respective phase time	10,000

### 8.3.3 Air Quality and Noise Management Plan (AQMP)

The main purpose of the AQMP development process is to establish an effective and sound basis for planning and management of air quality in a selected area to ensure optimal onsite and offsite air quality. It is also aimed at minimizing any negative impacts resulting from project related noise and vibrations. This type of planning will ensure that significant sources of impacts are identified and controlled in the most cost-effective manner.

**Table 8-3: Air Quality and Noise Management Plan**

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
<b>Air Quality Management</b>						
Use of earthmoving machines and electrical generators	Noise increase from traffic and machines/equipment.  Air pollution from moving equipment and machinery in the site (dust, noise, fugitive).  Deterioration of air quality due to dust, noxious gases and fugitive emissions from	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>Adequate safety measures, adequate height for exhaust gases like VOC &amp; PM will be controlled by equipment like, dust collectors (Bag filters), etc.</li> <li>All equipment will be maintained regularly to minimize emissions.</li> <li>All haulage and access roads to the construction site /railway stations will be sprayed with water to lessen dust.</li> <li>Use of PPE by all workers will be enforced, and appropriate EHS training will be undertaken by employees.</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	20,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	construction activities.					
Transportation of construction materials to the construction sites	Generation of dust and fumes Increase in noise from heavy machines (excavator, dozer) trucks/vehicles, generators and traffic.	Construction & Operations	<ul style="list-style-type: none"> <li>The speed of vehicles on all haulage roads will be controlled with proper signage and use of speed humps.</li> <li>All earth roads will be sprayed with water regularly in order to minimize dust generation on roads.</li> <li>Air quality monitoring stations will be established and checked regularly to ensure they are functioning properly and that the resultant data is used to assist the optimization of dust suppression activities</li> <li>Visible sources of dust will be formally observed and the observations correlated to the quantities of water to assist in the optimization of dust suppression activities.</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	20,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<ul style="list-style-type: none"> <li>In some areas where the transport road passes close to villages, road watering will be undertaken</li> <li>Use of PPEs such as ear muffs by all workers will be enforced, and appropriate EHS training will be undertaken by employees.</li> </ul>			
Standard Railway Gauge Operations	Reduce Carbon Emissions	Operational phase	<ul style="list-style-type: none"> <li>Electrified railway systems are generally more environmentally friendly than diesel-powered trains. TRC management will ensure there is environmental management sustainability to maintain this.</li> <li>Carbon-storing materials (eg bioplastic) will be encourage even for a minimal emission sensed (eg from service car/vehicles)</li> <li>Limit /reduce the use of energy from carbon emitting equipment associated with</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			SGR projects i.e vehicles and servicing generators <ul style="list-style-type: none"> <li>Encourage the use of alternative sources of energy rather than fuel and wood. Encourage the use electrical energy for workers during operation</li> </ul>			
<b>Noise and Vibration Management</b>						
Construction of stations, railway and workshop	Health and safety impacts to workers as a result of increased noise levels associated with project activities	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>Vehicles trips during daytime only fixing route by avoiding populated areas</li> <li>Noise will be regularly monitored plant boundary for checking compliance against environmental noise parameters as per TBS/WHO norms.</li> <li>It will also be monitored near noise generating equipment to ensure that all noise generating equipment do not emit noise in excess of the statutory norms.</li> <li>All workers will be provided with required set of PPEs like</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project's life span (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<p>earplug, earmuff etc. during construction and operation phase activities where noise levels in excess of 70 dB (A) are regularly generated. For operational purpose, at design stage, procurement of low noise equipment will be used.</p> <ul style="list-style-type: none"> <li>• Preventive maintenance of noise generating equipment shall be regularly carried out to ensure that noise levels are minimized to the extent possible.</li> <li>• Maintaining, to the extent practicable, the natural acoustic barriers (i.e., trees) between noise sources and neighbouring Communities</li> </ul>			

#### 8.3.4 Biodiversity Management Plan

The objectives for biodiversity and conservation in the greater project area include:

- Protection of the natural resources (fauna and flora) in the great extent of the project area;
- Education /sensitization of employees on the importance of sustainable natural resource use and conservation; and

- Promoting awareness amongst local communities on the importance of sustainable natural resource use and conservation.

**Table 8-4: Biodiversity Management Plan**

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Site clearance for railway construction and related infrastructures	Loss/disturbance of biodiversity and land degradation due to vegetation clearance  Interference/destruction of fauna pathways or routes.  Loss or inaccessible of medicinal plants by the community from the project site.  Disruption of wildlife	Construction	<ul style="list-style-type: none"> <li>• Confine construction work within the acquired project areas to minimize massive vegetation clearance to unnecessary areas</li> <li>• The vegetations of gully forest and 60 meters distance along the fringing riverine forest both sides should not be cleared for biodiversity conservation and protect the river banks from erosion.</li> <li>• Unnecessary tree cutting should be well minimized and gas should be used as a source of energy in camp sites for cooking to minimize trees falling.</li> <li>• No hunting or trapping of small mammals and birds on project site will be allowed and this will be enforced by Contractor in collaboration with the Wildlife Department.</li> <li>• Establish a department that shall ensure implementation, monitoring and evaluation within the footprint and neighbouring areas.</li> <li>• Where possible, representative large trees will be left within the project area,</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	20,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	<p>corridor (i.e Ugala river game reserve) due to vehicles movement and human activities</p> <p>Disruption of wildlife movement and migration</p>		<p>and will not be felled. During site clearance, construction a selective tree felling will take place, with large trees for shade, aesthetics and noise barriers left in place.</p> <ul style="list-style-type: none"> <li>• Restrict pedestrian access to the non-disturbed areas in order to allow fauna displaced from the project area to move through these areas</li> <li>• Ensure that environmental education of employees takes place at all levels to limit unnecessary damage to habitats and/or disturbance of fauna and flora.</li> <li>• Ensure habitat restoration throughout the project footprint,</li> </ul>			
Rehabilitation of disturbed areas	Loss of biodiversity due to disturbance from project related activities	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>• A nursery or similar source of indigenous tree species will be established and maintained for use in rehabilitation.</li> <li>• Re-vegetation plans will be developed in consultation with Tanzania forest service department to ensure that the species used are consistent with the local vegetation communities.</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	20,000



Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<ul style="list-style-type: none"> <li>In collaboration with local authorities, sensitization/training related to indigenous tree and fruit tree planting will be undertaken, and seedlings will be made available to communities.</li> <li>Training of communities on seed collection, germination and development of nurseries will be carried out so that the project can procure appropriate species of seedlings from the community nurseries.</li> </ul>			
Protection of wildlife and their habitats	Loss of biodiversity (notably wildlife and wildlife habitat)  Fire outbreak	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>In collaboration with TFS, TRC and Contractor will ensure that there is no hunting, trapping, capturing or killing of wildlife in the area unless carried out with authorization from the Department</li> <li>Wildlife ((birds, mammals (small and large if available) and reptiles)) will be protected during the preparation, operational, closure and post closure phases</li> <li>A plan for controlling wildlife access to the project site will be developed and implemented in collaboration with the</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	20,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<p>Department of Wildlife, and the plan will be reviewed from time to time</p> <ul style="list-style-type: none"> <li>The safety signs shall be clear displayed at the project area i.e. 'NO SMOKING' in order to avoid fire outbreak within the Ranch areas.</li> </ul>			
Protection of the aquatic environment	Loss of aquatic biodiversity, including associated habitats	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>Control plans for erosion and sediment control will be developed and implemented throughout the operational phase.</li> <li>A spills management procedure will be developed and implemented by the contractor during construction.</li> <li>Control plans for erosion and sediment control will be developed and implemented throughout the operational phase.</li> <li>The abstraction of water from rivers and streams in the lease area will be carried out in line with the approved quantities and procedures according to the Water Resources Management Act (No.11), 2009.</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Protection of endangered / rare species	Loss of indigenous /threatened flora and fauna species	Construction & Operations	<ul style="list-style-type: none"> <li>• Ensure that laws governing protection of rare endemic and endangered species are enforced and abided by</li> <li>• Limit movement of invasive species by introducing border check and controls</li> <li>• Vegetation clearing machines such as tractors and excavators should be well cleaned and being disinfected before they brought into the project area to avoid introduction of invasive plant species and pests from the previous places they have been working unless if they are completely new from the manufacture.</li> <li>• Frequently biodiversity surveys will be carried out as a way of monitoring the effectiveness of the conservation of the rare and/or endangered species</li> <li>• No hunting or trapping of small mammals and birds on the project site will be allowed, and this will be enforced by the TRC and contractor in collaboration with Wildlife Departments.</li> <li>• A program will be developed and implemented for the protection of all</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			areas identified as containing rare and/or endangered aquatic species.			

### 8.3.5 8.4.5 Social Management Plan

The objectives of the project's Social Management Plan are as follows:

- Ensure continuous training, awareness raising and communication with all employees and contractors regarding recruitment and human resources, environmental, health and safety issues.
- Develop good relationships with local communities;
- Promote livelihood enhancement programs for local people; and
- Promote grassroots environmental/biodiversity, health education and health and safety/risk aversion with local communities through on-going training and awareness raising initiatives.

**Table 8-5: Social Management Plan**

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Population increases in nearby community	Impact on community health and safety	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>• Conduct consultations with Regional, District and Village Authorities and NGOs on programs addressing STDs and</li> </ul>	Community Relations Manager	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	<p>Socioeconomic impacts related to in-migration (for example, increased business opportunities and money circulation, as well as health-related risks,</p> <p>Increase of vectors and pests diseases</p> <p>Trade Facilitation</p> <p>Enhancing economic growth</p> <p>Conflict/competition over employment opportunities between newcomers and locals.</p>		<p>HIV/AIDS in order to link and support the on-going efforts in addressing the impacts of the increase in population. Specific attention to gender and child-based vulnerabilities will be observed.</p> <ul style="list-style-type: none"> <li>• In consultation with the Regional, District and Local authorities, an expert will be engaged to support specific community health programs to support communities to handle STDs including HIV/AIDS. Programs will include, employee training awareness program, support in prevention, care and treatment program.</li> </ul>			

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	<p>Insecurity as a result of population influx</p> <p>Increased theft on the track rails to be used as scrap Metals</p>		<ul style="list-style-type: none"> <li>• Priority for employment especially for casual labour will be given to the indigenous</li> <li>• Business education on using economic opportunities associated with the project</li> <li>• Community participation in securing the project area and its vicinity will help to minimize the criminal rates</li> </ul>			
Communication between project & communities	<p>Lack of harmony</p> <p>Poor relationships as a result of lack of communication</p>	Pre construction, Construction & Operations	<ul style="list-style-type: none"> <li>• TRC will develop and distribute educational materials on the project, the environment and biodiversity, as well as health and safety.</li> </ul>	<p>Community Relations Manager</p> <p>General Manager</p>	Throughout the project life (phases)	10,000
General community well being	<p>Increase of Employment Opportunities</p>	Pre construction, Construction & Operations	<ul style="list-style-type: none"> <li>• Priority of employment will be given to local people in accordance with the required</li> </ul>	Community Relations Manager	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	Improvement of Local economy		<p>qualifications for particular positions.</p> <ul style="list-style-type: none"> <li>In consultation with District and Village leaders, community development programs will be established and implemented.</li> </ul>			
Decommissioning and closure activities associated with the project	Unemployment for local people due to the end of jobs	Closure	<ul style="list-style-type: none"> <li>Training and capacity-building programs that will prepare employees to be utilized in other projects after decommissioning will be developed and implemented.</li> <li>Each employee will be provided with pension scheme coverage through the National Social Security Fund and TRC will ensure that the due contributions are made.</li> </ul>	<p>Community Relations Manager</p> <p>General Manager</p>	Throughout the project life (phases)	10,000

Activity	Impacts	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Project operation activities	Spread of diseases such as STDs etc. Child Labour, Sexual harassment and Demoralization. Gender Imbalance	Mobilization, construction and Operation phase	<ul style="list-style-type: none"> <li>Prevention and control of transmissible diseases and HIV/AIDS, and community disturbance training and sensitization will be provided to the contractors, ensured in the loan assurances and monitored in the social action plans.</li> <li>Civil works contracts will stipulate priorities to: - (i) employ local people for works, (ii) ensure equal opportunities for women and men, (iii) pay equal wages for work of equal value; and (iii) not employ child or forced labour. Specific targets for employment have been included in the gender action plan.</li> </ul>	Community Relations Manager	Throughout the project life (phases)	10,000



### 8.3.6 Cultural Heritage Management Plan

The objective of Cultural Heritage Management Plan is to identify and evaluate the risks and potential impacts to the cultural heritage within the project area during the design, construction, operation, and decommissioning of the project and to establish preventive measures and plans to address them in appropriate manner with the identified risks and impacts.

**Table 8-6: Cultural Heritage Management Plan**

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Project development activities	Alteration of indigenous culture due to population increase.  Deterioration of culture and moral values  Family or Marriage fragmentation	Preparation, Construction & Operations	immediate suspension of construction activities if any archaeological or other cultural relics until the district or respective management authorities promptly notified, and construction will resume only after thorough investigation and with the permission of the appropriate authority.  Community must be sensitized on the social impacts associated with	Community Relations Manager	Throughout the project life (phases)	10000

			the projects such as culture values and marriage issues			
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#### 8.4.7 Health and Safety Management Plan

The objective for the Health and Safety Management Plan is to: Minimize the potential for incidences that lead to accidents and impacts to human health. The issues related to environmental health and safety interact closely, meaning that their management is also interlinked. The management strategies given in the above sections touch on several interacting issues of environment, health and safety.

**Table 8-7: Health and Safety Management Plan**

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Project development activities	Outbreak of diseases including but not limited to pandemic, sexually transmitted diseases due to labour influx such as HIV/AIDS, COVID-19 etc.	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>Health awareness and training will be conducted for employees and local community members</li> <li>TRC will collaborate with District Authorities to enhance existing HIV, COVID-19 and STDs community-based programs</li> <li>TRC will, in collaboration with District officials, participate in a road safety education program to promote awareness in affected communities and</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	Deterioration of employees and local community healthy  Health impacts to workers due to the presence of noise, fumes, and accidents.		<p>most-at risk groups, including school children, the elderly and women.</p> <ul style="list-style-type: none"> <li>• A health monitoring and evaluation system will be established and information will be periodically provided to communities.</li> <li>• The use of appropriate PPEs be enforced in working areas and their receptors</li> </ul>			
Acquisition and transportation of construction materials to the project area.	Traffic congestion  Accidents to human, livestock, and small fauna from moving trucks and operating equipment	Preparation, Construction, Operations and Decommissioning	<ul style="list-style-type: none"> <li>• Develop and implement traffic control and operation plans which shall include provisions for diverting or scheduling construction traffic to avoid morning, afternoon and evening peak traffic hours, regulating traffic at road crossings, building interim roads, selecting transport routes to reduce disturbance to regular traffic; and</li> </ul>	Environmental, Health and Safety (EHS) Manager in collaboration with TANROAD/TARURA	Throughout the project life (phases	10,000

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
	Risk for malaria from mosquitos breeding ponds and borrow pits		<ul style="list-style-type: none"> <li>• Speed limits will be implemented on all routes in the area for safety and environmental considerations.</li> <li>• Placement of road safety signs to populated areas, public and religious institutions.</li> <li>• Borrow pits must be backfilled after extracting construction materials</li> </ul>			

### 8.3.7 Aesthetics and Visual Impacts Management Plan

The objective for the aesthetics and visual impacts management plan is to minimize the aesthetic and visual impacts resulting from the project activities.

Table 8.7: Aesthetics and Visual Impacts Management Plan

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Management of aesthetic and visual resources	Loss of aesthetics/visual of the area.	Construction & Operations	<ul style="list-style-type: none"> <li>• Areas disturbed as a result of project will be rehabilitated and re-vegetated as soon as possible to minimize erosion by water and wind, aesthetically improve visual impacts</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<p>and will be appropriately listed in a register to prevent being re-disturbed</p> <ul style="list-style-type: none"> <li>• Orienting closure activities toward returning the site to as natural a state as possible will be undertaken in as timely a manner as possible.</li> <li>• Where possible, tree buffers and large trees will be left within the cleared areas to provide aesthetic value, shade and visual as well as noise barriers.</li> <li>• TRC will make sure that onsite and offsite land disturbance are controlled to the absolute minimum</li> </ul>			

### 8.3.8 Integrated Waste Management Plan

The objectives for the Integrated Waste Management Plan are to:

- Ensure safe transport, storage and use of all potential hazardous materials;
- Minimize the potential for accidental releases and ensure that those accidental releases that may occur are mitigated as soon as possible;
- Minimize waste generation and maximize recycling and the reuse of materials and waste to the extent possible;
- Ensure the long-term physical and geo-chemical stability of all onsite wastes; and
- Promote improved waste management practices for employees and local communities through awareness raising and training.

**Table 8-8: Integrated Waste Management Plan**

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
Materials Handling	Health & safety impacts to workers  Pollution and contamination	Construction & Operations	<ul style="list-style-type: none"> <li>• TRC will ensure that the potentiality for the spillage or loss of hazardous materials that could cause adverse impacts on groundwater or the environment, or compromise the health and safety of workers and the public are minimized to the possible extent.</li> <li>• A safety management system will be implemented and employees, contractors and visitors provided with</li> </ul>	Environmental, Health and Safety (EHS) Manager  Manager Supplies Manager	Throughout the project life (phases)	10,000

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			<p>appropriate training to ensure that they are familiar with safe hazardous materials handling practices and appropriate first aid measures as required.</p> <ul style="list-style-type: none"> <li>• Effective use of hazardous materials will be ensured so as to minimize hazardous waste generation</li> <li>• Hydrocarbon management guideline and procedures to be implemented.</li> <li>• Spill kits must be available at all storage and handling areas and at workshop areas, and training in proper use provided to employees.</li> <li>• All storage areas (for fuels and lubricants) will be compacted and have bunded containers.</li> <li>• Plan and implement an appropriate water monitoring and management plan.</li> </ul>			

Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
General waste management	Pollution and contamination  Health and safety impacts to workers	Preparation, Construction & Operations	<ul style="list-style-type: none"> <li>• Identification and classification of all wastes generated on site in different waste streams will be undertaken;</li> <li>• All workers on site will be trained on the handling, including separation of waste (hazardous and non-hazardous).</li> <li>• Procedures for handling of non-hazardous wastes (i.e., wastes that are not considered toxic, corrosive or explosive) will be developed and effected.</li> <li>• Measures for handling of hazardous waste (i.e., wastes that are considered toxic, corrosive or explosive) will be developed and implemented.</li> <li>• An incinerator will be installed onsite and an incineration procedure developed to ensure the correct operation of the incinerator.</li> <li>• A solid non-hazardous waste landfill will be established onsite</li> </ul>	Environmental, Health and Safety (EHS) Manager	Throughout the project life (phases)	10,000



Activity	Impact	Project Phase	Management Measures	Responsibility	Time Frame	Annual Budget US\$/Year
			and will only receive solid wastes that are classified as non-hazardous. The site will be fenced and will utilize a dump-and-bury approach to minimize potential for scavenging.			

Total cost for the environmental and social management plan during construction, operation and demobilization phases is approximately 340,000 USD. However, the estimated costs for implementing the monitoring plan are just indicative. The EIA team used informed judgment to come up with these figures. Appropriate bills of quantities should clearly give the actual figures.

### 8.3.9 Public Disclosure Plan

Public disclosure plan is guided by the public communication procedure in the project-specific Stakeholder Engagement Plan (SEP) developed in compliance with IFC Performance Standard 1 and the Guidance Note 1 (2007) on public disclosure considerations and indicators. This is a good international practice which TRC could follow. In view of the SGR project, this plan will provide for the periodic dissemination of information about potential risks or adverse impacts resulting from the processing activities and from cumulative impacts. Also, general information on the project, its workings, health and safety, as well as environmental and biodiversity aspects.

Public Communication Plan will be maintained in accordance with the guidelines summarized below: -

#### Public Communication Plan Guidelines

- TRC will, together with project affected stakeholders, outline a communication strategy, with achievable monitoring indicators to be reviewed periodically. Through this approach, stage by stage SGR activities will be communicated to the local communities;
- Mechanisms to periodically solicit inputs through consultations for community/District and other stakeholders on ideas related to project activities and on mitigation measures will be maintained. (This will help to ensure that communities are engaged and actively contribute to the project as it moves forward);
- A transparent and accessible information dissemination program about project - community relations, will be maintained. This will be incorporated in the Company's Corporate Social Responsibility (CSR) Program under the SEP; and
- A multi-stakeholder public grievance mechanism outlined in the SEP will be maintained in all local communities to deal with negotiations and public voicing of grievances related to the project and monitoring of responses to community claims on impacts at the village level in collaboration with the Village Executive Officer (VEO). This also includes recording of grievances and follow up by TRC in the grievance register.

#### **8.4 8.5 ENVIRONMENTAL AUDIT PROCEDURES**

In complying with the requirements of the Environmental Impact Assessment and Audit Regulations of 2005 and its amendments of 2018 and international guidelines, TRC project management will conduct Independent Environmental Audits annually. The annual report will review the performance of various environmental parameters.

Periodic environmental auditing will seek to undertake the following, as its minimum requirements:

Review all monitoring data and, if considered warranted by an independent third-party auditor.

- Review various environmental reports compiled throughout the year.
- Review operations, inspect facilities and observe monitoring activities for purpose of assessing effectiveness of the Company's environmental management procedures, implementation and identifying potential improvements if any.
- Prepare an audit report complete with photographic records and recommendations.

The final audit report, together with monitoring data for the previous year, will be distributed to the National Environmental Management Council (NEMC) for review, guidance and comments.

#### **8.5 8.6 REHABILITATION PLAN**

TRC will formulate and then implement a comprehensive Rehabilitation Plan, which will be adopted for the SGR project. The identified activities will be scheduled accordingly. The plan will be based on the principles of continuous rehabilitation and will form part of the "project closure plan" that will be prepared and implemented through consultations with the local authorities.

#### **8.6 8.7 EMERGENCY PREPAREDNESS AND RESPONSE PLAN (EPRP)**

SGR project management will develop a detailed Emergency Preparedness and Response Plan (EPRP) that will endeavor to provide: -

- A safe environment for all employees, contractors, visitors and neighboring communities.
- All activities are conducted in an environmentally responsible manner, consistent with Tanzanian environmental regulations, guidelines and best practice principles and standards.
- Identification and management of all significant environmental risks.
- Existence of a comprehensive system for managing emergencies and a high degree of emergency preparedness.

- Response to emergencies is focused primarily on the preservation of human life and the safety of emergency response personnel.
- Containment of emergencies and their effects within facility boundaries.
- Cooperation with external emergency response organizations.
- A safe return to normal operations.
- Recording of lessons learned from all incidents or ‘near misses’ on site, and learnings provided in training to employees and future actions.

Implementation of the EPRP will be the responsibility of the EHS Department. Implementation of the EPRP will involve: -

- Distributing copies of the EPRP to individuals designated by the General Manager and placing others at strategic locations, and ensuring that all copies are updated.
- Training all individuals with responsibilities for its implementation.
- Training all employees in general emergency notification and evacuation procedures at the time of their employment and annually thereafter.
- Organizing and training an emergency response team in accordance with applicable regulations and codes.
- Maintaining all emergency equipment, materials and supplies available so that they are in good working order.

## **8.7 ENVIRONMENTAL MONITORING PROGRAMMES**

SGR project management will develop procedures for environmental monitoring programmes and will ensure that monitoring reports are prepared and reported internally on a monthly basis and externally on an annual basis. The main monitoring programs will include the following: -

- Management of disturbed land register;
- Groundwater and surface water quality monitoring;
- Regular microbiological monitoring of portable water;
- Monitoring of Nitrogen oxide and Sulphur dioxide in the air;
- Noise and vibration monitoring of power plant and at various locations including those close to sensitive infrastructure and surrounding villages;
- Ambient dust monitoring and respirable dust monitoring; and
- Biodiversity-related monitoring.

## 9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

### 9.1 INTRODUCTION

The Environmental Monitoring System will be implemented as an addition to the Environmental Management Plan. This is done to monitor the impacts of the proposed project and mitigation measures and will provide a permanent record of these events. The monitoring program proposed is based on proposed project activities as well as expected future activities which have been identified during the Environmental Social Impact Assessment study.

The objectives of the Monitoring System are to:

- Provide a permanent record in compliance with ESMP against the present and future legislation;
- Control risks and (significant) environmental impacts;
- Control and improve the project on the basis of the operational information gathered;
- Continuously monitoring of improvements of environmental and social management systems;
- Provide a simple framework to improve the level of environmental management and compliance;
- Co-ordinate and integrate the tasks of the project proponent and those of the governmental agencies involved in the project implementation; and
- Integrate present and future environmental and social monitoring activities.

The principal purpose of the monitoring and reporting program is to provide information necessary to determine the project's operational and environmental performance within and close to the proposed SGR line. Regular monitoring serves as an indication of the efficiency of the mitigation and management measures, as well as compliance with standards, guidelines and permit conditions imposed by NEMC.

The monitoring and reporting program has been designed to:

- Comply with applicable Tanzanian legislation, standards and guidelines.
- Adhere to internationally acceptable good environmental monitoring practices.
- Allow periodic reassessment of the project effects and subsequent review of mitigation and management measures.
- Be simple to implement and report results.
- Be auditable.

TRC will be responsible for conducting the monitoring and reporting program as part of ongoing operations, and ensuring that sufficient resources are available for effective program implementation. Where appropriate, TRC may establish agreement with others (i.e., external

contractor) for provision of additional support in implementing the monitoring and reporting program. Table 9.1 below indicates the proposed environmental and social monitoring plan comprising all phases of the project

**Table 9-1: The environmental and social monitoring plan**

Monitoring plan	Impact	Monitoring Frequency	Monitoring area	Parameter to be monitored	Target Level/Standards	Responsible personnel for monitoring	Estimated cost per year (USD)
Soils, Land Management and Rehabilitation Monitoring Plan	Land expropriation, loss of property and resettlement	Twice before construction and on daily basis during construction	Project area and nearby community/surroundings	-Property -Number of PAP's -spills -Cleared areas -Erosion prone areas -Definite materials	Local and International Land and Compensation Acts and Guidelines	TRC/Contractor	50,000
	Alteration in land values						
	Loss of topsoil, soil erosion and contamination	Daily basis during construction phase	Quarry area and borrow pits	-Land			
	Loss of Definite Materials and Land Degradation	Daily basis during construction phase					

Monitoring plan	Impact	Monitoring Frequency	Monitoring area	Parameter to be monitored	Target Level/Standards	Responsible personnel for monitoring	Estimated cost per year (USD)
Water Monitoring Plan	Increased water and soil pollution  Increased water abstraction  Destruction of Public Utilities  Morphological changes in rivers and streams	Daily basis  Monthly  Daily basis during construction	Project area and the surroundings	-streams -rivers -soil -pipelines -Roads -power lines	TBS/WHO Water Quality Standards /Guidelines  Lake Tanganyika basin water board guildines  Urban and public utilities Acts and regulations	TRC/ /Contractor	50,000
Waste Monitoring Plan	Solid and Liquid waste generation	Monthly	Project area and the surroundings	-pH -BOD -COD -Total Nitrogen -Total phosphorus -Oil and grease	TZS Waste Pater Discharge Guidelines	TRC/ /Contractor	40,000



Monitoring plan	Impact	Monitoring Frequency	Monitoring area	Parameter to be monitored	Target Level/Standards	Responsible personnel for monitoring	Estimated cost per year (USD)
				-Total suspended solids -Total coliform bacteria			
Biodiversity Monitoring Plan	Loss and/or disturbance of biodiversity due to vegetation clearance  Increased rate of Natural Resources Exploitations  Disruption of wildlife movement and migration	Daily basis	Project area and surroundings	-Flora -Fauna	Biodiversity and Wildlife Conservation Acts and Guidelines  IUCN Red List of Threatened Species	TRC/ /Contractor	20,000
Air Quality and Sound/Noise Monitoring Plan	Noise, Vibrations and Air pollution	Monthly	Project area and receptors	-Noise Level -Vibration -Sulfur dioxide (SO <sub>2</sub> )	Tanzania Bureau of Standards/ WHO Air quality Guidelines		60,000

Monitoring plan	Impact	Monitoring Frequency	Monitoring area	Parameter to be monitored	Target Level/Standards	Responsible personnel for monitoring	Estimated cost per year (USD)
	Air pollution from demolition activities.		Demolition site	-Nitrogen dioxide (NO <sub>2</sub> ) -Particulate Matter PM <sub>10</sub> -Particulate Matter PM <sub>2.5</sub> -Ozone	Standards-TZS 845: 2005,		
Health and Safety Monitoring Plan	Occupational Safety and Health Risks  Increased Spread of HIV/AIDS and COVID-19  Increased crime and insecurity rates  Accidents to animals and	Monthly	Project area and nearby community	-Incidences -Number of accidents reported -New Infections /transmission cases -Number of reported incidences of crimes and insecurity	OSHA Local and International Policies on AIDS/HIV, COVID-19	TRC/OSHA /Contractor	50,000

Monitoring plan	Impact	Monitoring Frequency	Monitoring area	Parameter to be monitored	Target Level/Standards	Responsible personnel for monitoring	Estimated cost per year (USD)
	people due to demolition works.						
Socio-Economic Monitoring Plan	Violation of children rights by Contractor and labor force on site  Sexual exploitation and abuse of community members by project workers  Increased Theft on the track rails to use as scrap Metals  Unemployment	Monthly	Project area and nearby community	-Child labor  -Violation incidences/cases	Local and Internal guidelines on violation of human rights	TRC/ /Contractor	30,000
Heritage Monitoring Plan	Interference in believes and peace during grave relocations	Twice during land acquisition	Project area and the surroundings	-Cultural and heritage site	-Local and international Compensation	TRC/Contractor	10,000

Monitoring plan	Impact	Monitoring Frequency	Monitoring area	Parameter to be monitored	Target Level/Standards	Responsible personnel for monitoring	Estimated cost per year (USD)
				-Graves along the railway corridor	and grave removal Acts -Cultural Heritage Acts/Guidelines		
Compliance Monitoring Plan	Annual environmental audit, stakeholder consultation, public disclosure and Environmental Reporting Monitoring Plan					TRC- Environmental, Health and Safety (EHS) Manager	30,000

Total cost **320,000**

Total cost for the environmental and social monitoring plan during construction, operation and demobilization phases is 360000 USD. However, the estimated costs for implementing the monitoring plan are just indicative. The EIA team used informed judgment to come up with these figures. Appropriate bills of quantities should clearly give the actual figures.

### **9.1.1 Soils, Land Management and Rehabilitation Monitoring Plan**

This plan will address the monitoring of all impacts related to soils, land capability and management, rehabilitation (progressive and final) and closure, including: -

- Clearing of land, including avoidance/relocation of flora/vegetation species of conservation value. (Note: The Biodiversity Monitoring Plan will contain the specific details regarding the monitoring of flora and fauna);
- Re-vegetation with indigenous species (again, there will be some overlaps with the Biodiversity Monitoring Plan);
- Monitoring of erosion and siltation related to the project, (which will also be covered in more detail in the Water Monitoring Plan);
- Progressive rehabilitation of all exposed areas as soon as the activity causing the disturbance has stopped; and
- Final rehabilitation and closure of all disturbed areas; including continuous progress with achieving the Closure Plan objectives, achieving final closure and as far as possible leaving a safe, stable and self-sustaining ecosystem post-closure.

## 10 COST BENEFIT ANALYSIS

### 10.1 INTRODUCTION

The cost-benefit analysis presents a brief comparison of environmental and social costs of implementing the proposed project versus benefits accrued from the project after completion. It is a clear fact that it is not possible to account for all the impacts accrued from the implementation of the project. Reasons for this is direct and indirect impacts, short- and long-term impacts, site specific and other cross project boundary impacts that will affect a much larger population, although it might not be significant. Evaluation of these impacts is more or less dictated by the cultural and socio-economic characteristic of the surrounding environment to which the project has been subjected.

Therefore, the approach employed in this cost-benefit analysis will be based only on contrasting between the total amount of money that would be spent by the project in to the local community termed as "BENEFIT OF THE PROJECT" versus Opportunity cost of the items/issue the society will miss when the project is implemented plus environmental costs of mitigating any significant impact caused by project's activities after its fully implemented to the closure phase termed as "COST OF THE PROJECT".

### 10.2 THE PROJECT BENEFITS

Project components that will be referred to as "PROJECT BENEFITS" include:

- The cost of infrastructure development in the area that would benefit the community such as water supply systems, access roads, community support such as schools, health centers, and other social services.
- The total amount of revenue to be paid directly to the government such as taxes as well as payments to other related Institutions such as NSSF and PPF.
- The salaries of Railway employees which will be spent in the surrounding communities to improve the economy of the project affected Districts and the surrounding areas.
- The capital gained from locally purchased supplies such as construction materials and agricultural goods which will be part of TRC operating costs.
- Reduce cost of transportation in the country and the Region making Tanzania attractive to investment . The reduced cost will be part of an increase of operational cost to TRC

#### 10.2.1 Infrastructure Development

Several major infrastructural developments need to be set up before full railway operation can proceed. This will directly benefit the immediate communities surrounding the project as well as other stakeholders of the proposed project.

The communities within the project area will benefit from the rehabilitation of the access roads to the railway stations, which would be constructed by TRC.

The construction of the boreholes and underground water pipes for use by the project activities in dry season is another major benefit for Village residents nearby. The fresh water will be

made available to locals in the area for their domestic use for their livestock. This considers the fact that the quantity consumed by them is insignificant compared to the consumption of the entire railway Construction activities.

### 10.2.2 Salaries and Other Employee Benefits

The project will employ about 1347 people in a period of five years from 2023 to 2027. The construction/rehabilitation will include infrastructure such as roads, water boreholes, buildings/camps, workshops, etc. The employment of such a large number of people will boost trade in the project area especially with respect to food vending, domestic consumables, beverages, etc. Consumption of these items will generate further taxes to the government. More than 30% of the salaries earned by railway employees will be income taxes paid to the government every end of the month.

These salaries will be spent within the communities of Tabora, Uyui, Urambo, Kaliua Uvinza and Kigoma Districts. Purchasing of domestic consumables, food and other necessities will help boost these economies. This will attract food vendors and other merchants to the area, again boosting further trade, as well as enabling the government to collect more taxes.

In addition to the salaries, the project proponent should contribute 10% of yearly payroll as contributions to the National Social Security Funds (NSSF) for all employees.

### 10.2.3 Consumables

The maintenance workshops, offices, camps, etc., will consume a significant number of parts and materials during construction, operation and decommissioning phase of the project.

There are consumables which will be imported from overseas as they cannot be sourced locally. Fortunately, there will be consumables which could be sourced locally and will boost the local industry through development of new business avenues. The following list of consumables might be sourced locally:

- Water for the workers. Although boreholes and underground water pipes will be constructed by the proponent, the law requires water users to obtain permits to construct these boreholes and pay the specified annual fee to Lake Tanganyika Basin Water Board;
- Fuel (both petrol and diesel) will be used considerably. The consumption will boost trade and secondary employment generation for fuel suppliers. These suppliers and their employees will add revenue to the government through payment of income tax and other associated taxes particularly in construction phase.
- Natural Resources such as timber will be consumed during the construction of the camps etc. Their harvesting will fetch further revenues to the government through payment of taxes to the forest department;
- There are several other domestic consumables such as papers, containers, computers, furniture, fences etc. These will also be sourced locally and will boost trade in the project area, Districts and the entire nation.

### 10.3 PROJECT COSTS

The following project items will be termed as “COST”:

- Capital costs or Investment cost of the project
- The environmental and social costs spent as part of the Environmental and social Management Plan (ESMP) and Environmental Monitoring Costs;

#### 10.3.1 Capital Costs on infrastructure, land and resettlement

The estimated investment cost for the proposed constructions of Tabora-Kigoma electrified Standard Gauge Railway project is about USD **2,216,210,871.75**. This cost will be undertaken by project proponent which, when combined with other environmental and social costs, will provide the costs of undertaking the proposed project.

#### 10.3.2 Environmental and Social Costs

The major part of rehabilitation and closure will be undertaken progressively as the project advances and as the phases have been completed. This is covered as part of the operational costs spent on mitigating the various impacts caused by the project activities. The project proponent will be spending approximately US\$ 700,000 per year to mitigate these effects exclusive of the final closure costs of the railway. The proposed mitigation and enhancement measures recommended in this ESIA must be implemented in order to ensure that project benefits are realized or optimized

**Table 10-1: Environmental and Social Costs**

Estimated Environmental and social management cost	Annual social	Estimated Environmental monitoring cost	Total annual environmental and social cost
US\$ 340,000		US\$ 360,000	US\$ 700,000

### 10.4 BENEFIT– COST COMPARISON

When weighing all of the project's benefits against its costs in light of the information provided in sections 10.2 and 10.3, it is clear that the project initiative will have more positive effects than negative ones, both for the local community and the country as a whole.



## **11 DECOMMISSIONING PLAN**

### **11.1 INTRODUCTION**

This plan establishes feasible decommissioning schemes that can be accomplished without undue risk to the health and safety of the public and decommissioning personnel, without adverse effects on the environment and within established guides and limits of the appropriate regulatory agencies. The decommissioning plan will remain a 'living document' and revisions will be made throughout the operating life of the project. It must be reviewed periodically and revised to reflect any changes in operation that might affect decommissioning. Prior to the initiation of actual decommissioning activities for a project, a detailed final disposition plan will be prepared.

The final plan should be based on the preliminary plan and revisions and will define specific work activities and include safety evaluations of planned decommissioning methods, new technology, and the project status that will result from the decommissioning program. In addition, this plan must contain sufficient information to obtain any approvals needed from the appropriate regulatory agencies to proceed with decommissioning activities.

### **11.2 AIM OF THE DECOMMISSIONING PLAN**

The preliminary plan serves to establish decommissioning as an important consideration from the inception of the project during design and throughout the operation of the project. The plan has two purposes:

- a. To identify the ultimate decommissioning options and final project status. These options would be evaluated and narrowed to the decommissioning method of choice as the end of project life is approached; and
- b. To demonstrate to regulatory agencies that important aspects of decommissioning are considered. The plan serves as the starting point to demonstrate that areas such as decommissioning methods, costs, schedules, and operating impact on decommissioning will be reviewed and refined throughout the operating life of the project.

### **11.3 DECOMMISSIONING COMMITMENTS**

TRC decommission commitments will include the following:

- i. To prevent or minimize adverse long term social and environmental impacts associated with the project;
- ii. To enable all stakeholders to have their interests considered during project decommissioning;
- iii. To ensure the process of decommissioning occurs in an orderly, cost-effective and timely manner;
- iv. To ensure that the cost of decommissioning is adequately represented in company budgets;

- v. To ensure clear accountability and sufficient resources, for the implementation of the closure plan;
- vi. To return the land and vegetation to its original state with no infrastructure remaining

#### **11.4 CONTENT OF THE PLAN**

The plan provides a general description of decommissioning methods considered feasible for the proposed project. The description is intended to demonstrate that the methods considered are practical and that they protect the health and safety of the public and decommissioning personnel. Designated personnel should study the proposed decommissioning methods and take steps to ensure that the design incorporates features that will facilitate decommissioning. Considerations include:

- i. An estimate of manpower, materials, and costs anticipated to support decommissioning;
- ii. A description of the anticipated final disposition and status of the Service equipment and site;
- iii. A discussion demonstrating that adequate financing will be programmed for decommissioning; and
- iv. Identification of records that should be maintained during construction and operation which might facilitate decommissioning, including a set of “as built” drawings.

#### **11.5 PROJECT DECOMMISSIONING METHODOLOGY AND SCHEDULE**

The proponent shall fund and implement all aspects of project decommissioning, including but not limited to all engineering, environmental assessment, permitting, construction and mitigation activities associated with the removal of the structures in accordance with this plan and mitigation of project removal impacts on site. Developer shall monitor environmental impacts during and after project removal to respond to defined events during the monitoring phase.

- a) Decommissioning will involve but not limited to the specified list, because some issues or problems may surface during subsequent monitoring and audits:
  - i. The structures will continuously be rehabilitated and renovated. While doing that there will be solid wastes which will be disposed of according to the ESMP; and
  - ii. Moreover, during decommissioning the structures such railway, buildings etc will be demolished accordingly to suit the new activity while doing that the rubble will be disposed of according to the TRC directives.
- b) Employees will be terminated from their employments and to them the future will look blunt. Three things will be observed:
  - i. Their contributions to the Pension Fund will be made monthly as required by law;

- ii. A training programme will be made to continuously advance them into apt skills and professions;
  - iii. The termination benefits including transport and disturbance allowances will be made.
- c) On decommissioning the developer will search for 'expert's opinions' in order to convert the entire premises into another or other uses.
- d) Also, proponent shall obtain all permits required to undertake decommissioning of the project.
- e) The restoration plan for the entire premises will be made by the proponent (with expertise from environmentalists and economists) and then forwarded to NEMC for approval. After the approval of the decommissioning plan the metal parts will be removed first within the first three months (this is important to ensure that they are not vandalized). The second three months of the decommissioning will be used to remove concrete structures and foundations. Debris will be used as road fills for rural roads. All disturbed areas will be landscaped and revegetated using indigenous tree species

#### **11.6 REMOVAL OF INFRASTRUCTURE AND DEMOLITION**

Once SGR operations have ceased, decommissioning will commence and will involve the removal of Railway, buildings, infrastructure, facilities, equipment and services, unless otherwise agreed with stakeholders and approved by the GoT through its organs. Reusable and recyclable items will be salvaged and sold as scrap for recycling, or alternatively provided to community groups and businesses. Community groups will be provided the opportunity to undertake some salvage activities in line with acceptable health, safety and environmental practices. Items which do not have a residual value will be disposed of in accordance with best practices. However, the final decision on demolition of infrastructure will take into consideration the recommendations of the local and national closure committees.

## 12 SUMMARY AND CONCLUSION

### 12.1 SUMMARY

The ESIA study has identified a number of issues pertaining to the proposed construction of Standard Gauge Railway (SGR) project. The issues/impacts have been described and assessed in detail to gain adequate understanding of possible environmental effects of the proposed project at all stages of project development. The Environmental Management plan provides a way forward for implementation of the proposed mitigation measures. The Environmental and Social Monitoring Plan shows what has to be monitored during all phases. The estimated costs for implementing the mitigation measures as well as monitoring are just indicative based on consultant's informed judgment.

### 12.2 CONCLUSION

While a number of environmental impacts have been identified and assessed accordingly, none of them are considered to be too severe to make their improvement impossible. Mitigation measures and all engineering solutions proposed are sufficient to warrant planning, design and installation of the proposed construction of SGR project.

TRC is hereby committed to take care of its workers in case affected by the project operation activities throughout the project life cycle.

Given the nature and location of the development, the conclusion is that the potential impacts associated with the proposed development are of a nature and extent that can be reduced, limited and eliminated by the application of appropriate mitigation measures.

PaulSam Geo-engineering Company Limited (hereafter referred as the consultant,) is of the opinion that the environmental and social impacts identified may be mitigated. If implemented accordingly, the proposed environmental and social management plan and environmental monitoring plan will safeguard the integrity of the environment and the livelihood of the communities

Based on the findings of the ESIA and supplementary information outlined in this document:

- TRC wishes to seek the necessary environmental authorisation for developing the envisaged project;
- TRC is committed to ensure that the proposed ESMP is implemented for all phases of the project beginning with the mobilization, construction, operational to the closure phases;
- TRC is committed to ensure that the ESMP provides guidelines on managing/mitigating the impacts and monitoring the performance;
- TRC commits to provide environmental training and awareness procedures to its employees, neighbouring villages and other stakeholders who in one way or another will be impacted by the development of SGR project;

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**14 APPENDICES**

**14.1 Fauna Report**

**14.2 Flora Report**

**14.3 Archology and cultural heritage Report**

**14.4 Stakeholder engagement meeting**

**14.5 Location map**