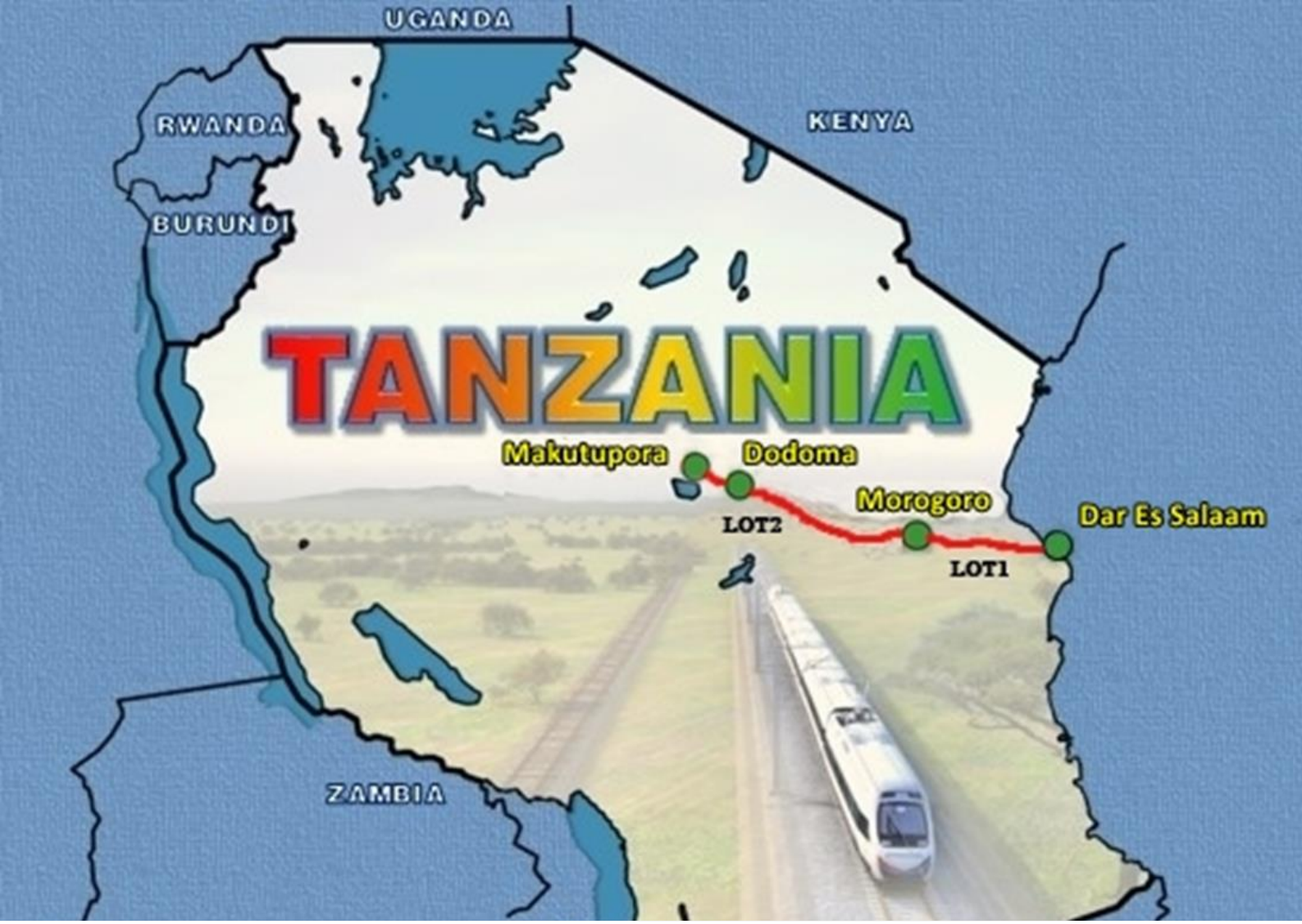

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Non-Technical Summary

Environmental and Social Impact Assessment (ESIA) for the Standard Gauge Railway Line (SGR) Project, Dar es Salaam – Makutopora, Tanzania

30 August 2019

Project No.: 0453091

FINAL

Tanzania Railways Corporation (TRC)

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Tanzania

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Acronyms and Abbreviations

ARU	Ardhi University
AU	African Union
BAP	Biodiversity Action Plan
EAC	East African Community
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
GoT	Republic of Tanzania
IFC	International Finance Corporation
MGR	Metre Gauge Railway
NEMC	National Environment Management Council
RAP	Resettlement Action Plan
RoW	Right-of-Way
SEP	Stakeholder Engagement Plan
SGR	Standard Gauge Railway
ToR	Terms of Reference
TRC	Tanzania Railways Corporation

1. INTRODUCTION

1.1 What is this Document?

The Tanzania Railways Corporation (TRC) is in the process of building a new railway line from Dar es Salaam to Makutopora – called the Standard Gauge Railway Project. As part of the legal permitting of the Project in Tanzania, extensive studies were made by local experts from Ardhi University to minimise the potential impacts of the Project on people and on the environment. Further investigations were made with the support of international experts (from ERM) to meet the requirements of the IFC/WorldBank and other international banks who are helping to finance the Project. Overall, the various studies extended over about two years and resulted in many 100s of pages compiled in the Environmental and Social Impact Assessment (ESIA) Reports.

This document in hand is a Non-Technical Summary (NTS) of the main findings of the ESIA studies conducted for the SGR Project.

For all topics mentioned in this NTS many more details are available in the final ESIA Report and related documents such as the Environmental and Social Management and Monitoring Plan (ESMMP) which defines exactly which actions are needed to prevent, minimize and manage adverse impacts caused by the different railway development activities.

The above mentioned documents are already available at Yapı Merkezi's website https://yapimerkezi.com.tr/En/Projects/Ongoing-Projects/Dar-Es-Salaam-Morogoro-RAILWAY , and will also be available at TRC's website soon.

1.2 Where to get more information?

The intention of TRC is to make it easy for the public to become informed about the Project, and to invite the public to provide their views and comments (whether positive or negative) about the Project.

For any questions, complaints or concerns about the ESIA process or the SGR Project in general, or to receive further information, please contact **TRC** through the contact details stated below.

TRC contact under:	
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1.3 What is the status of the ESIA and permit process?

Currently, the national ESIA study prepared by ARDHI University in Dar es Salaam has been approved by the Tanzania National Environmental Management Council (NEMC).

In parallel, the ESIA was reviewed by the international lenders to determine if the requirements of the WorldBank/IFC are being met. The final ESIA is publicly available at Yapı Merkezi's website as defined in Section 1.1.

2. PROJECT DESCRIPTION

2.1 General Overview -Why is this Project Needed?

The Government of the United Republic of Tanzania (GoT), through the Tanzania Railways Corporation (TRC), is undertaking numerous efforts to expand and modernise the country's railway infrastructure. One of the key projects is to construct a new railway link called the "Standard Gauge Railway" (SGR), from Dar es Salaam to Mwanza (1219 km). The overall SGR Project follows the African Union (AU) and East African Community (EAC) decision in 2006 that all new railway development projects in the region will be implemented to the standard gauge specification so that trains can more easily pass from country to country.

The implementation of the overall SGR Project will be undertaken in separate steps. In the first step, the GoT is currently investing in the first railway segment from Dar es Salaam to Makutopora, which has a total length of about 541 km. In the second step, the GoT will further invest in the construction of the remaining segment from Makutopora to Mwanza (about 678 km); this second step will be subject to separate construction contracts, ESIA studies and permits.

This report refers to the current SGR segment from Dar es Salaam to Makutopora – which is called the "SGR Project" in this document.

The GoT, through TRC, has contracted the Turkish company "Yapi Merkezi Insaat VE Sanayi" ("Yapi Merkezi") to provide design services and to construct the SGR Project. Yapi Merkezi in turn will employ further subcontractors for the construction of various aspects of the SGR Project. After completion, TRC will operate the railway.

The route of the SGR line broadly follows the same route as the existing Metre Gauge Railway (MGR) along the entire length from Dar es Salaam to Mwanza.

Overall, the SGR Project aims at promoting sustainable mobility along the Central Corridor of Tanzania, through the construction of the railway line from Dar es Salaam to Mwanza, and new lines from Isaka to Kigali in Rwanda, and Musongati in Burundi.

The SGR Project is a top priority to create socio-economic opportunities in the hinterland of Tanzania and will greatly contribute to Tanzania's economic growth and other EAC states as well.

The SGR Project is needed to relieve the road networks, which are overloaded, and to reduce maintenance costs of roads as well as travel time for transportation of people and goods. The SGR Project is also in line with the overall aim of the GoT to revitalize and reinvigorate the rail sector so as it can contribute more to the national economy.

2.2 Route of the SGR Line

The SGR Project will commence in Dar es Salaam and then pass through the stations in Pugu, Soga, Ruvu, Ngerengere, Morogoro, Mkata, Kilosa, Kidete, Gulwe, Igunda, Dodoma, Bahi and Makutopora. An overview of the routing is shown in the figure below.

The proposed Dar es Salaam-Morogoro-Makutopora SGR will be undertaken in the following two phases:

- Phase I or Lot 1 (Dar es Salaam to Morogoro – 205 km), and
- Phase II or Lot 2 (Morogoro to Makutupora – 336 km).

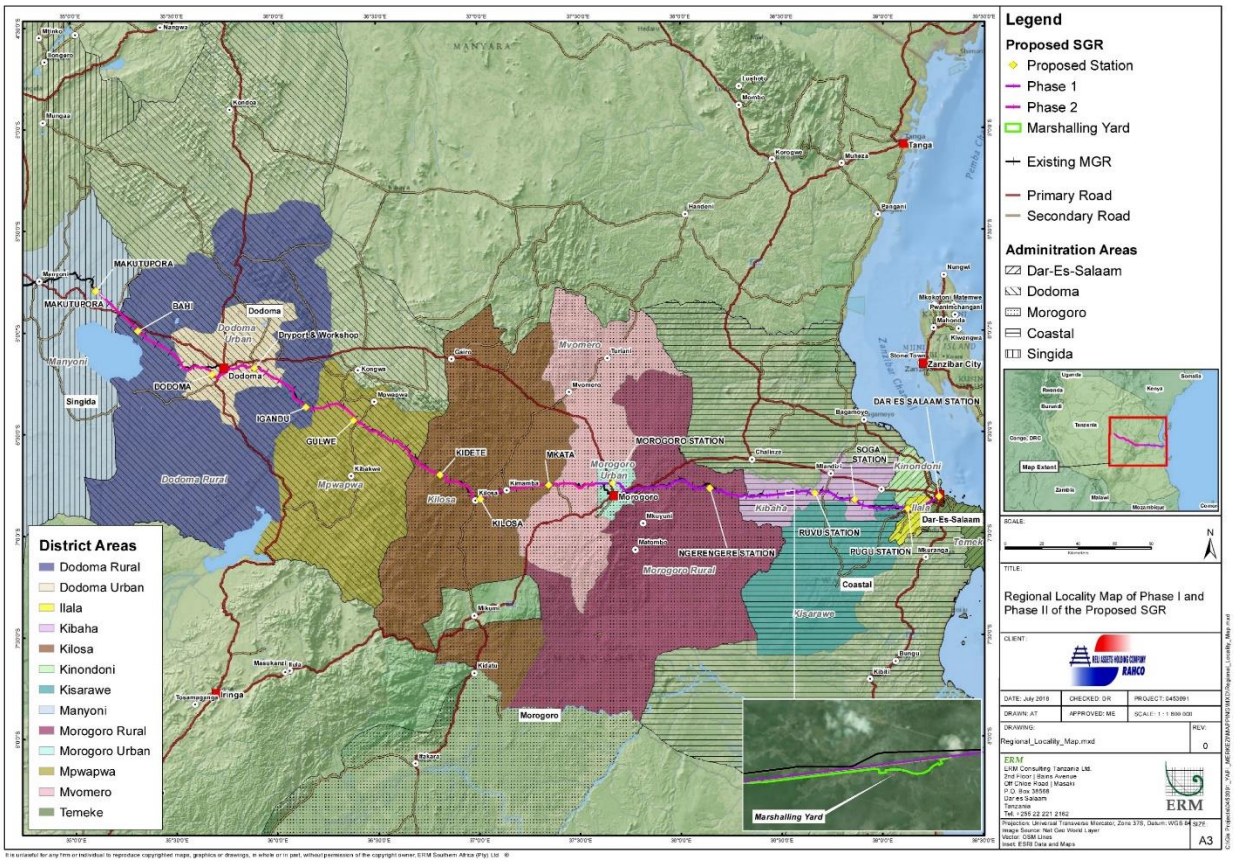


Figure - Route of SGR Project from Dar es Salaam to Makutopora.

2.3 Technical Description of the SGR

The SGR will be a single-track electrified railway for a design speed of 160 km/h for passenger trains and 120 km/h for freight trains. The maximum train length will be 2000 m with a passenger capacity of 1.1 million passengers per year. The SGR rail width of the SGR is 1435 mm (4ft 8½ in), as compared to the narrower 1000 mm (3ft 3in) width of the existing MGR line. This means that the SGR can handle larger/heavier trains and at faster speeds.

The SGR will be elevated above-ground for the first part of its route through Dar es Salaam. Approximately 51 km of Lot 1 (Dar es Salaam to Morogoro) and the entire Lot 2 (Morogoro - Dodoma - Makutupora) will be fenced along the alignment, both on the left and the right side. Additionally, for Lot 1, fencing will be in place in urban areas, around passenger stations, freight facilities and marshalling yardsto prevent pedestrian access onto the track facilities.

The SGR system is designed to use electricity for powering its trains; therefore, it is necessary to have reliable power to feed the railway system along its entire length. Consequently, a 220 kV single circuit transmission line (TL), from the existing Kinyerezi substation (in Dar es Salaam) to the existing Kingolwira substation (in Kingolwira village, near Morogoro), will be constructed and operated by Tanzania Electric Supply Company Limited (TANESCO). This new TL will have 160 km length and will be running in parallel to the existing high voltage TL between these substations.

The TL's source will be the Kinyerezi existing gas-fired power plant and the power will be discharged in four substations along the route, namely Pugu, Ruvu, Kidugalo and Kingolwira. This TL will cover Lot 1 of the SGR (Dar es Salaam- Morogoro) and has been considered as an Associated Facility[1] to the SGR

[1] Associated Facilities are defined by the IFC as "…facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable ".

Project. A similar approach will be taken for Lot 2. TANESCO currently has two substations in Kingolwira and Dodoma and an existing TL connecting them. However, because these are far from the SGR alignment, TANESCO is also planning to build a new 220 kV substation between Kingolwira and Dodoma. The new substation is intended to feed the railway lines in case of of the existing substations (Dodoma and Kingolwira) malfunctioning.

2.4 Construction Timing

The construction activities for the SGR Project will be done in two phases:

- Phase 1: “Dar es Salaam - Morogoro section” (205 km); envisaged construction period from May 2017 to May 2020;
- Phase 2: “Morogoro - Makutupora section” (336 km) envisaged construction period from February 2018 to February 2021.

The commencement of SGR railway operations is envisioned shortly after completion of construction (and commissioning) works in each Phase.

2.5 Construction Works

The SGR Project will be implemented under the so-called “Design-Build” pro ject delivery system. TRC has already entered in contract with the Turkish company Yapi Merkezi to implement the railway construction for the first 200 km between Dar es Salaam and Morogoro (already under construction).

The construction activities for the SGR Project follow the typical sequence for such projects, eg:

- Survey Works and technical testing of the route
- Expropriation and Resettlement of homes, farms, businesses in the right-of-way
- Clearance of Existing Land and Vegetation
- Earthworks and Civil Works, Construction of Culverts/drains and the track bed
- Placement of Overhead Wiring, Signalling & Telecommunication Works
- Construction of Buildings and Bridges
- Final Commissioning, including electrification of the line and fencing

The railway construction will also involve related activities such as:

- Extraction and transportation of building materials (eg rock, timber, soils, fill material)
- Establishment of temporary storage areas for spoil/overburden materials
- Construction of new railway stations; campsites; storage yards; electricity substations and power transmission systems; access roads.

The stations along the SGR are to serve as passenger and freight facilities. Dar es Salaam, Morogoro and Dodoma Stations will also include water supply infrastructure. The marshalling yards will include maintenance and assembly workshops, tank-washing points, living quarters, general office buildings and other facilities.

Related infrastructure will be constructed to keep open existing roadways and water courses, eg

- Overpasses and underpasses where the proposed SGR intersects with existing roads.
- Culverts over natural watercourses or for drainage.
- Viaducts where the proposed SGR passes through well-established towns and or cities;
- Underpasses to allow cattle (livestock) and people to cross the railway

During the construction phase, about 7,000 people are expected to be employed during peak times across the Project locations. It is expected that a significant size of the workforce will be recruited locally through subcontractors. Stationary and mobile camps for temporary accommodation of mainly specialist workers at Ilala, Soga and Ngerengere have already been established, whilst Kilosa and Dodoma are still in progress.

Operational Phase & Railway Maintenance

The period of operation is designed to continue for around 100 years, after which re-laying of new rail will become necessary. It is initially planned that 24 trains (20 freight and 4 passenger trains) will be using the SGR line during normal operations over 300 days in a year. During the remaining 65 days per year, traffic will be reduced slightly to 20 trains (16 freight and 4 passenger) to enable TRC to carry out routine maintenance activities on the line. . Maintenance of the SGR is generally separated into:

- *Regular maintenance*, involving planned priory and periodically repeating maintenance works, with the goal to remove smaller defects and shortages on the railway.
- *Investment maintenance*, involving all works that cannot be done under regular maintenance, such as the reconstruction of specific parts of the railway and other servicing.
- *Unplanned maintenance*, involving unplanned breakdowns and unavoidable accidents (e.g. floods, landslides), emergency situations.

3. DESCRIPTION OF PROJECT AREA

3.1 Land Use & Economic Activities

The existing land use along the railway line is primarily agriculture, grazing, forest reserves and human settlements.

The proposed SGR route passes through various habitats for both flora (plants) and fauna (animals), including natural vegetation, settlements and patches of degraded cultivated land (Figure 3 1). In accordance with IFC[2], habitats are characterised into three major categories, namely, natural, modified and critical.

- The natural habitats are areas composed of plant and/or animal species of largely native origin. These include forest reserves of Pugu, Ruvu South, Chisungwe and Ngerengere. It also includes some pockets of thickets between Dodoma and Makutopora.
- The modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin. Most of the habitats along the SGR route fall under this category. The modified habits include degraded natural forest, human settlement areas and cultivated land (smallholder and plantations).
- The critical habitats are defined as areas with high biodiversity value. There was strong evidence for critical habitats to occur in the Coastal Forest Mosaic Ecoregion, and specifically within the Pugu Hills and Ruvu South Forest Reserves, where habitats have been protected. To support this critical habitat assessment, baseline studies have been conducted and the field studies confirmed that the Pugu Hills and Ruvu South Forest Reserves, Rondo Dwarf Galago, African Wild Dog, Ruvu Spiny Reedfrog, Pugu Striped and Pugu Forest Grasshoppers and the large bat congregations associated with two Kaolin Mine shafts and with an old tunnel prior to SGR construction activities were defined as critical habitat.

Overgrazing and poor cultivation methods close to the railway line have resulted in land degradation, particularly in soil erosion near the railway line. Grazing along the railway has also contributed to the degradation of the top soil, and the removal of natural vegetation cover, promoting soil erosion.

[2] Performance Standard 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources

The main economic activities are agriculture, livestock keeping, industry, mining, fishing, petty trading. Whereas the Agricultural sector employs most of the population, the mining industry is both of small and large scale, the latter being represented by Williamson Diamond in Shinyanga. General industry is mostly situated in large cities, especially in Dar es Salaam and in Mwanza.

3.2 Population

The regions traversed by the SGR Project are inhabited by around 20 million people (per 2012 national census), which is about 43% of the total population of Tanzania. There are many ethnic groups which are traversed by the railway line including the

- Wazaramo, Warugulu, Wakaguru and Wakwere in Dar es salaam, Coast and Morogoro regions;
- Wagogo and Wanyaturu in Dododoma and Singida regions;
- Wanyamwezi, Wasukuma and Wakerewe in Tabora, Shinyanga, Simiyu and Mwanza regions.
- There are also pastoralist groups of the Maasai and Barabaig -present in the Districts traversed by the Project. In particular, in Magindu and Miziguni villages (Kibaha District, mid part of Lot 1), Parakuyo and Mbwade villages (Kilosa District, mid-east part of Lot 1) and Kinonko and Kidugalo villages (Morogoro Rural District, west part of Lot 1). There are also pastoralists groups along Kisarawe District.

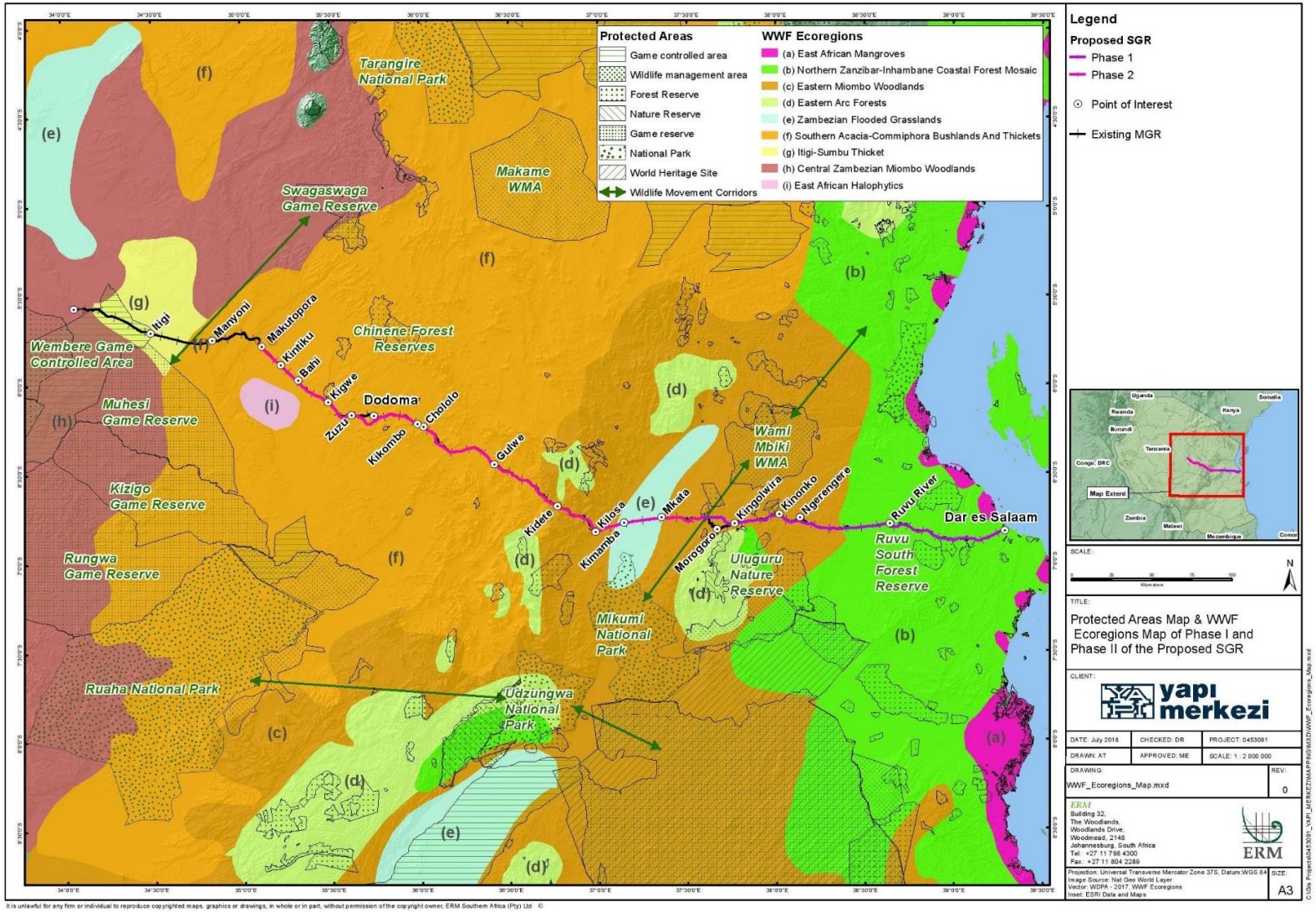


Figure 3-1 Layout of Protected Areas and Ecoregions along the SGR Project Alignment.

4. HOW WAS THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT CONDUCTED?

4.1 General ESIA Process

The impact assessment process predicts and describes environmental and social (E&S) impacts that are expected to occur for different phases of the SGR Project; based on this assessment the appropriate set of actions is defined to help avoid or minimize the impacts. Subsequently, a monitoring and evaluation programme is implemented to assess the effectiveness of the mitigation measures.

The ESIA for the SGR Project was carried out using different scientific methodologies to comply with the EIA Regulations and good international practice. The main ESIA steps are described below.

4.2 Initial Desk Study

The first ESIA step included a review of relevant literature pertaining to the SGR Project and project areas. Much of the background information on the project was collected from TRC – which included the project conception, plans, project coverage as well as existing E&S studies, baseline description and other assessments. In addition, relevant district and regional profiles were used as sources of data and information that describe baseline conditions.

4.3 Stakeholder Consultation

Stakeholder engagement – meaning discussions with institutional stakeholders (government authorities), nearby residents, affected persons and other interested parties - was done within the ESIA process to gather information, to disclose the project to affected people and to gather their perceived project-related concerns.

A Stakeholder Engagement Plan (SEP) has been prepared to coordinate stakeholder engagement and project disclosure. The SEP was also used as a tool to enable TRC to align with international best practice for engaging stakeholders and to ensure that this has been done in line with a culturally appropriate approach. The SEP includes a Stakeholder Identification, a Stakeholder Analysis, Engagement Planning, and the Development of a Communication Strategy. Further information on the Stakeholder Engagement is given in chapter five of this NTS.

4.4 Data Collection and Observations

Interviews and documentation methods were supplemented by physical observations to identify features within the specific route (Right-of-Way RoW) of the SGR Project. Fauna and flora specialists, social & environmental assessors and valuation and compensation experts conducted several fieldwork trips in the Project areas.

The fieldwork involved physical surveys, social-economic surveys, verification of secondary information, and consultation in order to gather information on physical, biological, cultural and social-economic aspects of the SGR Project through sampling, site walkovers and engagement with local stakeholders. The resettlement experts undertook a physical survey of the project affected structures and land use.

4.5 Impact Assessment

The impact assessment applies the proposed project activities onto the baseline environmental and socio-economic conditions of the project site. The result is an identification of potential environmental and social impacts of the proposed SGR Project.

In this regard, several project alternatives were also considered, including that of not implementing the project. At this stage, it is very beneficial if initial findings from the impact assessment can be

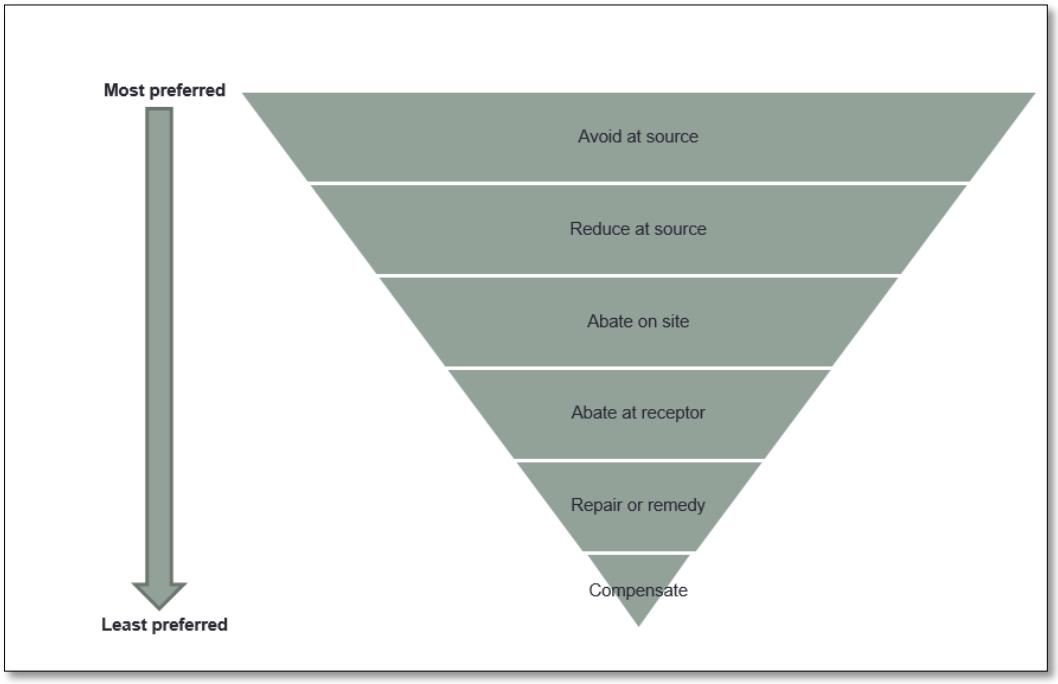
passed on to the Project designers so that they can improve the design to avoid subsequent negative impacts during construction - and to enhance the positive impacts.

A key guiding assumption in this ESIA is that the SGR Project will be designed, constructed, operated and maintained with due care for safety and environmental matters using current and practical engineering designs and methods that also meets good international practice for such projects.

4.6 Identification of Mitigation Measures

The ESMMP for the SGR Project details environmental and social actions – the so-called Mitigation Measures - to minimize the potential impacts identified in the ESIA, including the requirement to establish and implement an Environmental and Social Management System (ESMS). Further information regarding the management and monitoring of project impacts is given in chapter seven of this Non-Technical Summary.

The Mitigation Hierarchy:



5. HOW IS THE STAKEHOLDER ENGAGEMENT DONE?

Generally speaking, the term “stakeholders” refers to local residents, public institutions, private organisations and other persons who may be (positively or negatively) affected by the Project or are otherwise interested in the Project.

Stakeholder engagement, as a part of the ESIA process, is all about how the developer of the project provides information to the stakeholders – and asks them about their views of the Project, including any comments, suggestions, questions or complaints. This two-way process of stakeholder engagement is a very important part of the overall SGR Project, beginning prior to start of construction and continuing through the operations. Identification of the relevant stakeholders as well as involving them in the entire ESIA study was guided by the Stakeholder Engagement Framework.

The principal entities identified for this ESIA Study included government ministries, departments or agencies at national, district and local levels, private companies, non-government/civil-society organisations (NGOs), community- based organizations, user groups and people directly affected by the Project, such as goods and services providers.

5.1 Stakeholder Engagement Plan (SEP)

The SEP is a separate document describing the mechanisms by which involved people, communities and other stakeholders are informed about the Project and given opportunities to provide comments and input to the Project development. The SEP describes the engagement already undertaken in the past as well as meetings and other events planned for the future. In line with current international best practice, the SEP aims to ensure engagement that is free of interference and intimidation. Engagement should also be relevant, understandable and provide accessible information in a culturally appropriate way. The SEP thus allows affected people to give their opinions and concerns, and allow that these concerns influence Project decisions.

The SEP covers the pre-construction and construction phases of the Project. The SEP covers:

- engagement activities for the land acquisition phase (particularly for Lot 2);
- disclosure of the Project ESIA Package;
- engagement during Project construction.

This SEP is a *'living document'* and will be regularly updated as the Project progresses and, for example:

- new stakeholders are identified for the Project;
- more details become available on stakeholder preferred means of engagement;
- more resources are needed for implementing the SEP;
- responsibilities for implementation change or are delegated.

A key part of the SEP is the so-called "Grievance Mechanism", which provides an easy way for every person affected by the SGR Project to submit their comments, questions or complaints (so called "grievances") to the responsible project managers of the project developer. Under the Grievance Mechanism, all such grievances submitted are tracked and must be responded generally within 30 days.

The SEP does not cover engagement during operation and decommissioning phases. Separate SEPs will need to be developed by TRC as the Project progresses into these phases.

5.2 Stakeholder Engagement Activities

Stakeholder engagement and project consultation was undertaken during the preparation of the ESIA and included the following activities:

- Consultative Meetings with Regional District Authorities and Utilities Companies; and
- Public Consultation through
  - Meetings with Communities (namely Village and Ward Leadership, in the settlements of Pugu, Soga, Ngerengere, Mkata, Gulwe, Bahi, Kintiku, Zuzu and Makutopora);
  - Public Consultations with Villagers;
  - Focus Group Discussions, involving ward leaders, economic venture groups, influential elders, self-help groups, sports team leaders, teachers, income-generating groups, livestock keepers, farmers, women, disabled, businessmen and women;
  - Household Questionnaires.

5.2.1 Consultation with Authorities

Consultative meetings were held in all nine regions traversed by the SGR, which include Dar es Salaam, Coast, Morogoro, Dodoma, Singida, Tabora, Shinyanga, Simiyu and Mwanza.

At regional and district levels, the consultations involved discussions with regional and district officers, specialists and other knowledgeable people and key informants. Specific consultations were undertaken with Regional Commissioners, Regional Administrative Secretaries, Regional Secretariat experts, District Commissioners, District Administrative secretaries, Chief Executive Officers of City/District/Municipal Councils, and Utilities agencies.

The Tanzania Railways Corporation (TRC) (Headquarters) and major stations at Morogoro, Dodoma, Kilosa, Munisagara, Nzaganza, Kidete, Godegode, Gulwe, Kikombo, Ihumwa, Zuzu, Bahi, Kitinku and Makutupora were also part of the consultation.

5.2.2 Public Consultation

Public consultation is an inclusive and culturally appropriate process, which involves sharing information and knowledge, seeking to understand the concerns of others and building relationships based on collaboration (Figure 5-1). The public participation process is designed to provide information to and receive feedback from stakeholders for use throughout the ESIA process, thus providing them with an opportunity to raise concerns and make comments and suggestions regarding the SGR Project.

The main aim of the consultation process is to inform people about the proposed Project and incorporate the views of stakeholders in the design of the mitigation measures, the Environmental and Social Management and Monitoring Plan (ESMMP) and the Resettlement Action Plan (RAP).

Meetings with Communities – Village and Ward Leadership

Brief meetings were held with local leaders including ward and village officials for the wards/villages traversed by the SGR Project. The following settlements were sampled for consultative meetings within the range of specific criteria: Pugu, Soga, Ngerengere, Mkata, Gulwe, Bahi, Kintiku, Zuzu and Makutopora.

Meetings with ward/village leaders focused on the existing socio-economic situation in the area and the need to identify clusters of people likely to be adversely affected by the SGR Project. The discussions provided an opportunity to introduce the Project to the leaders and identify key informers.

Figure 5-1 Consultation with the Public/ project affected communities (Source: ARU ESIA, 2018).

In addition to these activities, in April and May of 2019, the Project undertook systematic consultations with communities to gain a high-level understanding key livelihood activities, constraints, and opportunities with efforts targeting an understanding of traditionally marginalised groups (namely women and vulnerable groups).

Between June and August 2019, the Project began the initial screening of potential livelihood restoration implementation partners who will continue to be engaged throughout the land acquisition and livelihood restoration implementation process.

These engagements are complemented by ongoing studies including a specialist-commissioned Indigenous Peoples (IP) Assessment to identify Indigenous Peoples within the Project area.Continued engagement as per the Informed Consultation and Participation Strategy (ICP) for IPs[3] with affected IPs will be required to ensure that underpasses, overpasses and livestock crossings are effectively communicated and utilized.

Public Consultation with Villagers

Public meetings were conducted in the surveyed settlements, as mentioned above. The following wards and/or villages were consulted during public consultation:- Makutupora Station, Kinkintu, Bahi, Zuzu, Ihumwa, Mkata, Msamvu, Ngerengere, Soga and Pugu Station.

Topics of major interest for the communities included:

- land take and compensation;
- public safety;
- employment;
- human immunodeficiency virus (HIV) infection and acquired immune deficiency syndrome (AIDS) and other sexually transmitted diseases;

[3] The Informed Consultation and Participation Strategy for IPs shall set out how IPs will be meaningfully consulted and informed about impacts and involved in the design of mitigation in accordance with the provisions of PS 1 and PS 7 (paragraph 10) and associated IFC Guidance Notes 1 and 7.

- solid and liquid waste management during construction and operation;
- drainage, flooding and sedimentation;
- removal of infrastructure and utilities within the Right of Way (RoW);
- increased traffic;
- provision of service ducts.

Focus Group Discussions

Another form of public consultation, performed within the SGR Project, consists of so called “Focus group discussions”. These focus groups involved groups of women, ward leaders, economic venture groups, influential elders, self-help groups, sports team leaders, teachers, income-generating groups, livestock keepers, farmers, women, disabled, businessmen and women.

The income levels of the population (i.e. low, middle and high) typically determines the affordability of basic needs and social services and other goods. The focus group discussions ensured that all income levels were fairly represented, and issues related to gender diversity were addressed.

Household Questionnaires

The individual household information in combination with the conclusions from the focus group discussions contributed to the ESIA. Moreover, fifteen questionnaires were conducted in the ten sampled villages mentioned above with emphasis on gender balance. From the household questionnaires quantitative information was obtained, while other sources gave qualitative information.

Photo showing Enumerator conducting questionnaire survey with villager at Kintinku (Source: ARU ESIA, 2018).

6. THE MAIN FINDINGS OF THE ESIA

6.1 Summary of the Findings

The ESIA has identified potential impacts (both positive and negative, Table 6-1) to the physical, natural and socio-economic environments. In order to avoid, minimise and reduce negative impacts, and to ensure that opportunities for the enhancement of positive impacts are realised, an overall ESMMP has also been developed.

Table 6-1 Benefits and Negative Impacts of the Project

Environmental and Socio-Economic Benefits	Negative Environmental and Social Impacts – if NOT properly mitigated…
■ Boost of the local economy/ economic growth through improved connectivity within and outside the country's borders and improved access to markets. ■ Increased capacity of the central railway yielding lower Transport costs & shorter travel times – avoiding truck traffic on the roadways ■ Employment Opportunities, both direct and indirect yielding increased money circulation/ income situation ■ Improved access to social services for residents ■ Improved agriculture through better access to farming inputs ■ Increased socio-cultural interaction ■ Improvement in social infrastructure (schools etc.)	■ Water Pollution ■ Soil erosion ■ Loss of natural habitat ■ Noise and vibration ■ Air pollution and Greenhouse Gas emissions ■ Safety and health risks ■ Increased Wastes ■ Increased water abstraction and pressure on water resources ■ In-migration /influx of people from other areas ■ Increased spread of HIV/AIDS and other diseases through worker influx ■ Resettlement/ impacts on livelihoods ■ Traffic congestion near urban construction areas ■ Disturbance of (intangible) cultural heritage ■ Community severance or "the barrier effect" ■ Loss of critical habitat ■ Blockage of wildlife passages ■ Altered drainage ■ Loss of access to land

Overall, the ESIA study results show that the SGR Project will entail certain negative environmental, health & safety and social implications, during the land acquisition; construction and operation stages. The associated negative impacts can be minimized largely through good engineering design and envisaged construction practices and through implementing construction and operations-phase environmental and social management systems. Specific mitigation measures have been suggested in the ESMMP to avoid and minimize the inherent adverse impacts. Implementing these mitigation measures would thus increase environmental and social soundness of the SGR project. The SGR Project is predicted to have high long-term socio-economic benefits to the people of Tanzania.

It is, therefore, concluded that implementation of the proposed SGR will entail overall acceptable level of impacts, provided that the recommended mitigation measures in the ESMMP are adequately put in place in a timely manner.

TRC and its contractor Yapi Merkezi are committed in implementing all the recommendations given in the ESIA and ESMMP and further carrying out the environmental auditing and monitoring schedules.

6.2 What are the Positive Impacts?

The proposed SGR Project will have a number of positive impacts and benefits, especially to the local communities and the local and national economy, as summarised in the above Table 6-1 . The mitigation measures in the ESIA and ESMMP aim to enhance these positive aspects. For example, further indirect employment and income can be achieved – especially for unskilled/low-skilled persons - by promoting the use of local service providers such as drivers, cleaners, caterers etc.

6.3 What are the Main Negative *Environmental* Impacts?

6.3.1 Loss of Habitats

For the most part, the SGR will be constructed within (or near) the existing right-of-way (adjacent to the existing MGR tracks) and therefore vegetation clearance will be limited, except where there are major realignments, at the sources of construction materials and at areas where associated facilities will be constructed.

The negative impact anticipated from clearing of vegetation will be opening up of the area especially by felling large indigenous trees. As a result, the area that is temporarily exposed is likely to be subject to soil erosion. Permanent clearance will be confined only to the railway track/line.

The railway traverses through various types of habitats outside of protected areas including natural vegetation, settlements and cultivated land (Figure 3-1). The natural vegetation supports a high diversity of plant species, but these are mostly widespread and their habitats are in relative abundance.

The large indigenous trees and areas of natural vegetation lost to the project also support a range of key species and species groups. Furthermore, a number of permanent and ephemeral wetlands are to be lost or degraded by the project, prior to mitigation.

Examples of mitigation to avoid and minimise impacts include e.g. limiting the clearance of vegetation to the strip of land needed for the occupation of the permanent railway corridor and adjacent working width; protecting large trees directly adjacent to construction by covering their trunks; and restoring areas temporarily affected by construction to a state as close to the original conditions as practically possible.

The Project has developed a Biodiversity Action Plan (BAP) in line with IFC performance standards to promote the sustainable protection and management of biodiversity resources, to maintain the ecological integrity of protected areas and to maintain the benefits from ecosystem services through the adoption of practices that integrate conservation needs and development priorities.

The BAP explains where no net loss of biodiversity and net gain requirements are needed, and develops mitigation to achieve these targets. These include a programme of wetland restoration and of sustainable charcoal production. Monitoring measures are presented to measure the future achievement of these targets.

6.3.2 Impacts to Protected Areas

The Pugu Hills and Ruvu South Forest Reserves are the protected areas that are directly affected by the SGR, therefore impact assessment focusses on the impact to the Pugu Hills and Ruvu South

Forest Reserves. The proposed route passes alongside and marginally through the Pugu Hills and Ruvu South Forest Reserves. Approximately 11% of the Pugu Hills Forest Reserve will be fragmented from the main block, while the route passes along the northern boundary of the Ruvu South Forest Reserve. Some sections of the SGR alignment through the Pugu Hills Forest Reserve follow the old MGR route and the reserve is currently impacted by this route. Other sections of the SGR alignment necessarily deviate from the MGR route to avoid sharp bends and accommodate a high-speed rail.

A broad range of mitigation measures are presented within the BAP, of which the majority are relevant to the protection of the forest reserves. Additional conservation programmes proposed in line with IFC PS 6 include re-establishing lost forest and conservation support for the forest reserves. These will not alter the impacts, but rather serve as a form of compensation for them.

6.3.3 Fragmentation Impacts to Wildlife Corridors

The ESIA, following communication with the Tanzania Wildlife Research Institute (TAWIRI) noted the existence of wildlife migration routes between conservation areas that will be intersected by the SGR. A TAWIRI (2009) report describes two wildlife corridors that will be intersected by the SGR, namely between the Mikumi National Park- Wami Mbiki Wildlife Management Area (WMA) and the Selous Game Reserve - Wami Mbiki WMA.

These wildlife corridors were investigated, and evidence of regular elephant movement across the SGR route was confirmed. The SGR will be fenced, but fences will be constructed to pass over the top of culverts and underpasses, so that they do not obstruct wildlife, livestock, and human or vehicle movements through these structures. Bridges will not be fenced and the proposed bridges, culverts and underpasses will be adequate to accommodate elephants and all other forms of wildlife, with the exception of giraffe; however, there has been no evidence that giraffe are present in the study area.

Given these measures and the number of other smaller underpasses and crossing points along the alignment, the current SGR design is not expected to severely fragment wildlife populations, and no design changes are therefore proposed. This permeability for wildlife is, however, dependent on these bridges, culverts and underpasses being kept free of debris, not being occupied as shelters by people or used as vehicle parking facilities. As such, measures have been included within the BAP to monitor these features and maintain their condition.

6.3.4 Impacts on the Air Quality & Noise

Dust will mainly be generated from earth movements during the construction phase of the SGR Project or from moving /travelling of trucks and machinery along unpaved surfaces.

Along the proposed project area, the adjacent areas are relatively open, without blocking air movements and can thus enhance the dilution of dust and other air pollutants. Leafy vegetation

should also be able to filter out a considerable amount of air emissions. Thus, ventilation and vegetation are anticipated to lessen the air pollution issue of the SGR Project.

Construction activities will involve fully or partially closing local roads in Dar es Salaam and Morogoro, which could increase local traffic jams and cause additional air pollution from the exhaustion of the cars.

Noises from vehicles during the construction phase due to various construction machinery at site or the transportation of materials are another aspect of consideration. Construction activities and operational vehicles generate noise and vibration, which can cause disturbance to humans. However, the impacts will not be significant because the railway passes to a great extent far away from human settlements.

Appropriate measures of management have been identified through the ESIA and are implemented within the ESMMP (e.g. preparation and implementation of a Dust Management Plan; vehicles and construction machinery will be required to be properly maintained and to comply with relevant emission standards; all construction equipment will comply with the requirements of Tanzania Bureau of Standards (TBS) on noise emission; construction works will not be permitted during the night; the operations on site shall be restricted to the Period 07.00 - 19.00 h etc.).

It is anticipated that the operation of the SGR will result in generation of noise and vibrations from a variety of sources. Noise reduction or prevention measures will be implemented from the design phase, such as usage of modern non-metallic disc brakes, reducing rolling noise, and consideration of soundproofing at noise-sensitive areas.

Because the railway is electrified, with only occasional use of diesel engines, no air quality impacts along the railway corridor are predicted as a result of Project operation.

6.3.5 Waste Management & Soil and Water Pollution

The waste streams from construction activities as well as from workers at the camp and project site can create impacts to the environment if not managed properly. The solid waste include waste rocks, spoil, rubbles, tree logs, metals, glasses, papers etc. while the liquid waste include sewage, oils etc.

These wastes, if not well handled, can further change the aesthetic nature of the project area and can even lead to water pollution in case of improper disposal of oils.

Small-scale and short-term water pollution may result during construction of drainage structures.

Rivers that are expected to be impacted and flow all year long include the Ruvu River, Mkata River and Mkondoa River. Seasonal rivers, such as Mpiji, Ngerengere, Kidete, Kidimo and Mzase, will be impacted during the rainy season.

Various type of solid and liquid wastes will be generated during construction. The wastes may contaminate soils or be washed into local surface and ground water resources and impair the quality of these. Moreover, accidents and spills of fuels and oils may occur during refuelling and minor equipment repairs.

Appropriate measures of management have been identified through the ESIA and are implemented within the ESMMP (e.g. Preparation and implementation of the Sedimentation and Erosion Control plan or the Waste Management Plan; construction of civil objects in water courses to be done only during dry season to minimize effects on water flow, water quality and aquatic flora and fauna; the extension of the construction area next to water courses will be only that strictly necessary to adequately perform the construction works etc.).

An Environmental and Social Operation Management Plan (EOMP) will be prepared to detail how the mitigation identified in the ESIA will be delivered during operation phase. The EOMP will be supported by a standalone Waste Management Procedure to be followed (and those responsible for implementing the actions) to achieve the mitigation of the impacts.

6.4 What are the main negative *Social* Impacts?

6.4.1 Community Health, Safety and Security

Construction projects are commonly associated with social interactions amongst the construction workers and local communities. The increased number of workers and higher concentration of residents near the SGR Project construction sites can have an impact on local communities.

The entry of temporary labour force into an area could cause different negative impacts to the local communities, including (i) conflicts due to socio-cultural differences or other issues; (ii) Potential increase in crime during the construction period; (iii) increased spread of communicable diseases.

The impacts on the community health, safety and security will be localized and can have significant effects. Appropriate measures of management have been identified through the ESIA and are implemented within the ESMMP (e.g. preparation and implementation of a Health & Safety Plan for construction works; a Traffic Management Plan, Emergency Preparedness and Response Plans for construction and for operations, a Community Health & Safety Educational Programme, provision of public access to project information.).

A Community Safety Operation Management Plan will be developed to support the Environmental and Social Operation Management Plan and address mitigation measures required during the operation of the railway to protect people and animals from accidents.

6.4.2 Loss of Access

Fencing of the SGR will lead to a possible separation of communities in the project areas. Some people may also find it difficult to access infrastructure and social facilities (e.g. shopping markets, schools, churches). Wildlife and livestock will also not be able to move freely in search of pasture, water and breeding ground in these areas. There may also be informal tracks or pathways used by community members to access infrastructure or for moving livestock to water or grazing, which also may become affected. However, these impacts have been reduced by appropriate measures of management through provision of 35 underpasses and 43 overpasses, which shall be used by people and animals for crossing the railway line. The overpasses and underpasses have been located strategically at settlements and at existing animal crossings.

In some cases, there may be sections of land between the existing MGR and the new SGR, which will not be directly affected by the Project, but may be made uneconomic following acquisition of a part of the plot for the Project. These land areas are referred to as “orphan land” and could be eligible for compensation on a case-by-case basis.

The nature of the impacts to be experienced by indigenous pastoralist communities in particular livelihood and cultural related impacts. Continued engagement as per the Informed Consultation and Participation Strategy (ICP) for IPs[4] with affected IPs will be required to ensure that underpasses, overpasses and livestock crossings are effectively communicated and utilized. This will inform the development of a Severance Management Plan[5] as well as informing updates of the Project Design and the RAPs, as needed. Local tracks, routes and crossing points will be identified and mapped for both the wet and dry season using engagement (with communities and livestock grazers) and remote sensing. In addition, the infrastructure, services, water pans etc. that people are accessing will be mapped, and based on this information, crossing points will be identified. Where needed, tracks will

[4] The Informed Consultation and Participation Strategy for IPs shall set out how IPs will be meaningfully consulted and informed about impacts and involved in the design of mitigation in accordance with the provisions of PS 1 and PS 7 (paragraph 10) and associated IFC Guidance Notes 1 and 7.

[5] The Severance Management Plan will, amongst other, map crossings and water points used by pastoralists through additional informed consultation and participation (ICP),

also be upgraded near these crossing points to ensure continued safe access for people and livestock.

6.4.3 Expropriation and Land Acquisition

The law requires the Project to clear a RoW (i.e. a corridor) of 15 metres in towns and cities while outside the towns, the RoW should be 30 metres on either side of the centre line. For the sections where the SGR goes parallel to the existing MGR, the SGR shall be constructed within the existing RoW and therefore 15 metres of land will be permanently taken on one side to compensate the used portion of the RoW. Where the SGR passes completely out of the existing RoW (eg bypass at Morogoro), a RoW of 60 metres will be cleared for railway construction. Within this RoW, no structures or buildings can be established.

The Project will require permanent land acquisition comprising approximately 3,692 hectares (1,500 hectares for Lot 1 RoW and 2,192, hectares for Lot 2 RoW). Additionally the Project will require acquisition of land outside the RoW for the establishment of borrow pits, dumping sites, quarry sites, construction of marshalling yards and campsites. While the use of these areas will be temporary, the Project will acquire the required land permanently. These represent additional 1,157 hectares of land (784 hectares in Lot 1 and 373 hectares in Lot 2). These additional facilities are located at distances of up to 2 km from the SRG line.

To date, through RAP activities that have taken place to date, approximately 6,798 households (3,126 for Lot 1 and 3,672 for Lot 2) will be affected by the project through physical and economic displacement. Additionally, 32 public infrastructure (e.g. schools, dispensaries etc.) shall be affected (21 in Lot 1 and 11 in Lot 2).

Resettlement for the Project is being managed by TRC according to the requirements of Tanzanian legislation on land acquisition and involuntary resettlement. The RAPs were developed for Lot 1 and Lot 2 to meet Tanzanian and Lenders requirements. These aims to mitigate the adverse effects of resettlement through the provision of compensation for loss of assets (land, structures, business, crops and trees) and ensuring that resettlement activities are implemented with appropriate disclosure of information and the informed participation of those affected by the Project.

TRC will conduct additional data collection through the completion of a Livelihood Impact Assessment (LIA). The LIA will involve completion of a census and basic socio-economic survey of all Project-affected households to construct a detailed demographic and socio-economic profile of each affected household. The information collected in the LIA will serve as the basis for assessing vulnerability and livelihood activities, and for establishing the baseline for monitoring and evaluation. The LIA will involve the basic socio-economic survey of those households evicted from the MGR RoW in 2017/2018 to construct a detailed demographic and socio-economic profile of each affected household. Households losing more than 25% of their total land holding due to the Project will be identified as ‘severely impacted’.

TRC will implement a comprehensive Livelihood Restoration Plan. This plan consists of an initial set of programmes that have been developed in line with international resettlement standards and provides for the development of supplementary programmes based on the results of the Livelihood Impact Assessment (LIA). Where compensation is not deemed to meet requirements of Full Replacement Cost, TRC is committed to paying an additional compensation amount equal to the value of depreciation for owners of non-residential structures to bridge the gap in replacement value defined under the IFC.TRC will pay additional compensation for owners losing only non-residential structures. The rate of compensation will be equivalent to the rate of depreciation applied during asset valuation.

During the operational phase, however, no additional land acquisition and physical and economic displacement activities will be required.

7. HOW WILL THE IDENTIFIED RISKS BE MANAGED?

The ESMMP describes the environmental and social mitigation and monitoring measures, the criteria for their successful implementation and the organizational measures to be implemented during the (pre-) construction and operation of a project. The ESMMP is included in the ESIA package of documents, which is made publicly available. Going forward, the ESMMP will be regularly reviewed and updated as the project evolves to reflect any changes in the implementation and organization as well as in regulatory requirements.

The ESMMP for the SGR Project details environmental and social actions, in order to minimize the potential impacts, and includes the requirements of an Environmental and Social Management System (ESMS) and an ESMMP. The ESMS in turn includes other management plans that are key to an adequate implementation of the SGR Project, such as a Resettlement Action Plan (RAP), Biodiversity Action Plan (BAP), a Waste Management Plan, Health & Safety (H&S) Plans for construction works, an Emergency Preparedness and Response Plan, a Traffic Management Plan, a Chemical Accident and Spills Management Program and others.

In addition to these management plans, other key components of the SGR Project's ESMS include training, audits and inspections and reporting.

8. HOW WILL THE IMPLEMENTATION BE MONITORED?

Monitoring is the systematic collection of data through a series of repetitive measurements over a long period of time to understand the impacts of the project, highlight any problems & address them. The Project's ESMMP provides the mechanism to monitor the environmental and social impacts of the project implementation in order to reduce their negative effects and to introduce standards of good practice to be adopted for all further project works.

The ESMMP includes ongoing monitoring of numerous aspects, such as:

Land Expropriation, Loss of Property and Resettlement aspects	Vegetation Change	Water Quality Change
Air Quality Change	Noise and Vibration (Baseline)	Soil Erosion
Waste Management	Safety and health risks	HIV AIDS statistics
GHG Emissions	Presence of invasive species	Biodiversity

How can the stakeholders be sure that all these actions will be undertaken in the future as promised in the ESIA and the ESMMP?

The Project activities will be monitored and checked frequently by numerous parties, eg.

- The Tanzanian regulatory inspectors and regional/local officials will conduct their obligatory, statutory inspections per the Tanzanian permits and regulations applicable to the Project;
- Yapi Merkezi will monitor its own activities – and those of its subcontractors – per the obligations and commitments in the ESIA/ESMMP, and must submit periodic reports to TRC;

- TRC will monitor the activities of Yapi Merkezi to ensure they are abiding by their contractual obligations, including conformance with permits and ESIA/ESMMP commitments; TRC will need to report periodically to the Project Lenders on progress in implementation of commitments;
- Finally, the international Project Lenders for the SGR Project will conduct periodic monitoring visits of the Project to ensure that TRC, Yapi Merkezi and all other parties are in compliance with their obligations under the loan agreement. Typically, the Lenders conduct visits on a semi-annual basis during construction, and then annually during operations.

If the lenders discover that there are serious gaps in the implementation of the ESIA/ESMMP obligations, they are able to exert pressure on TRC to rectify the situation. As such, for the SGR Project there are multiple-layers of monitoring and reporting obligations to help ensure that the ESIA/ESMMP obligations are ultimately implemented for the Project in a satisfactory manner.