

# THE UNITED REPUBLIC OF TANZANIA



## MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION

### CONSULTANCY SERVICES FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR UPGRADING OF IRINGA – IRINGA (IPOGOLO)-IDETE REGIONAL ROAD: IRINGA-KILOLO SECTION (33.61KM) TO BITUMEN STANDARD

CONTRACT NO: AE/001/2018-2019/IR/C/1(C)

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED UPGRADING OF (33.61KM) IRINGA-KILOLO ROAD TO BITUMEN STRANDARD IN IRINGA & KILOLO DISTRICTS – IRINGA REGION

SUBMITTED TO:  
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### NON-TECHNICAL EXECUTIVE SUMMARY

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## Non-Technical Executive Summary

### 1.1 Background

The Government of the United Republic of Tanzania has set aside funds to undertake the Environmental and Social Impact Assessment (ESIA) including development of the Environmental and Social Management Plan (ESMP) as well as to undertake the Resettlement Action Plan (RAP) for the upgrading of Iringa-Kilolo section (33.61Km) to bitumen standard. The road improvement is part of the Government strategy to develop its road network to support socio-economic development of the country.

TANROADS and the World Bank initiated discussions to consider the upgrading to Bitumen Standard of Iringa (Ipogolo) – Idete Regional Road, Iringa – Kilolo Section (33.61Km) under the potential **Roads to Inclusion and Socio-economic Opportunities (RISE) program**.

### 1.2 Requirements for an ESIA

This Project falls under the list of projects requiring EIA pursuant to the First Schedule made under Regulation 6(1) of the Environmental Impacts Assessment and Audit Regulations, 2005 and Regulation 17 of its amendments of 2018.

Also the World Bank requires that all environmental and social risks and impacts of the project be addressed as part of the environmental and social assessment conducted in accordance with ESS1. ESS2–10 set out the obligations of the Borrower in identifying and addressing environmental and social risks and impacts that may require particular attention.

### 1.3 Approach and Methodology

The ESIA methodology was subject to the EIA procedures of Tanzania as per Environmental Impacts Assessment and Audit Regulations, 2005 and Regulation 17 of its amendments of 2018:

### 1.4 Limitations of the Study

- Delayed acquisition of historical weather data for Iringa region from Tanzania Meteorological Agency led the consultant to use data from other sources.

### 1.5 Assumptions of the Study

- The study assumes that the respondents provided information that are reliable on the implementation of the project;
- The study assumes that the Design Consultant shall incorporate ESIA mitigations into the design of Iringa (Ipogolo)-Kilolo road project; and
- The study also assumes that the project contractor will fully adhere to ESMP

### 1.6 Key Components of the Proposed Road Project

Key components of the proposed road upgrading project are : Carriage Way, Shoulders, Pedestrian Walkways, Storm water Drains, Service Roads, Bridges and Drifts, Outlet Ditches, Side Ditches, Culverts, T/Y Junctions, Bus Bays, Road Signs and Crossings, Road Side Parking Lots, Road Lights

#### 1.6.1 Road Classification

The road is classified as **Regional Road – Road Design Class DC4**. The road will be upgraded from gravel road to bituminous standards, the minimum design criteria for the road are as follows:

- Carriageway width: 6.5 m
- Shoulder width: 1.5 m
- Right-of-way width: 60 m

### 1.6.2 Pedestrian and Cyclists Ways

Shoulders along the project road shall be used for pedestrians and cyclists. A 2.0m wide shoulder has been provided in built up areas to ensure safety of pedestrians.

Consultant has provided a raised 2m wide cycle way and 1.5m wide for footway on built up area(villages) and Town centers – Ipogoro and Kilolo as it was noted that combined daily volume of pedestrians and cyclists is exceeding 400.

### 1.6.3 Junctions and Access Roads

Intersection design and control is a major factor in improving road safety. The identified and possible accident spots have been considered in the design by providing facilities such as pavement markings, signs, and traffic islands to regulate and direct conflicting traffic streams into specific paths.

### 1.6.4 Realignments

The proposed road alignment generally follows the existing alignment with minor improvements (realignments) due to several factors with key ones indicated below:-

- Avoiding sharp curves
- Improving road drainage
- New locations of Bridges
- Avoiding built-up areas and religious buildings hence reducing compensation costs
- Improvement of road safety
- Reduction of cost of construction

### 1.6.5 Road Furniture

These shall include: Road Signs and Road Markings, Bus Bays, Guardrails and Chutes , Road Humps and Rumble Strips, Road Edge Marker Posts, Kilometer Markers

## 1.7 Project Schedule and Life

Site preparation for the proposed Iringa – Kilolo Section (33.61Km) road upgrading project is expected to start soon after approval of all related studies, engineering designs and environmental clearance and construction tender award in early 2020. The project life is expected to be 20years.

## 1.8 Estimated Project Cost

The proposed Iringa – Kilolo Section (33.61Km) road upgrading project construction is estimated to cost approximately 47.054 Billion TShs (VAT Incl). PAPs' compensation, Environmental and Social Management and Monitoring and related activities are estimated to cost approximately 2.5 Billion TShs (VAT Exclusive).The project is wholly funded by the Tanzanian government through loan from World Bank.

## 1.9 Project Cycle

### 1.9.1 Project Planning Phase

ESIA and RAP, preliminary engineering planning, final engineering planning and construction planning form the planning phase of the project.

### 1.9.2 Project Mobilization & Construction Phase

The mobilization and construction phase will take place subsequent to the issuing of Environmental Impact Assessment Certificate and once a construction contract with a suitable contractor is signed. The construction phase is expected to be approximately 18- 24 months for the proposed road.

All efforts will be made to ensure that all construction work will be undertaken in compliance with local and national legislation, local and international best practice, as well as the Environmental and Social Management Plan (ESMP).

During the construction phase, both skilled and unskilled temporary employment opportunities will be created. Approximately 300 direct and indirect employment opportunities are expected to be created during the construction phase.

### 1.9.3 Project Operation Phase

Once the construction phase is completed, the roads will start to operate to serve the intended purposes. The activities that are expected to be executed during operational phase include:

- Transportation of goods, agriculture produce and services
- Traffic management
- Road and Facilities maintenance

### 1.10 Sources for Construction Materials

Quarry and borrow pit sites for the project's construction materials are within the project's districts as indicated on table below.

S/N	CHAINAGE(KM)	OFFSET (KM)	LOCATION	VILLAGE	DISTRICT	TYPE	SIDE	REMARKS
1.	10+000	0+200	Kitayawa	Tagamenda	Iringa	Borrow pits	LHS	Along Iringa/Ipogolo-Kilolo road Road, Settlements are located 860m on the West of the pits
2.	24+100	0+050	Chama	Italula	Kilolo	Borrow pit	RHS	Along Iringa/Ipogolo-Kilolo road Road, Settlements are located 60m on the East of the pit
3.	35+000	3+000	Lulanzi	Lulanzi	Kilolo	Borrow pit	LHS	Along Kilolo-Lulanzi Road, Closest Settlement is located 70m on the East of the pit
4.	36+000	0+200	Mazombe	Mazombe	Kilolo	Quarry	LHS	Along TAANZAM Highway(From Ipogolo)
5.	42+000	0+500	Ndolela	Ndolela	Iringa	Quarry	RHS	Along Dodoma Trunk Road(From Ipogolo)

### 1.11 Water Supply

Water for construction and maintenance of the road during operation shall be drawn from Ruaha River and its tributaries located adjacent to Iringa-Kilolo road on the left of the road section between Ipogolo and Tagamenda village as well as Ndiwili village where the river crosses the road to Kilolo. Alternative suitable sources i.e. Boreholes will be determined based on demand and location/distance from the road segment under construction.

### 1.12 Power Supply for the Project

Power supply for the proposed project's construction activities will be provided by TANESCO and generators for performing hot works, lighting e.t.c. During operation phase of the road, the project ancillaries might be use solar power or connected with TANESCO power lines where necessary.

### 1.13 Required Permits

Prior to the approval of the construction and eventual construction of the Project, it is necessary to obtain a number of authorizations and permits from local and central government authorities of Tanzania as indicated below

Permit/Authorization	Issuing Authority	Description
EIA Certificate	NEMC/VPO	Approval of project implementation
Resettlement Valuation Report	Government Chief Valuer	To allow compensation and resettlement procedures
TTCL Infrastructure Relocation Approval	TTCL-Regional Office	To wave away construction of the proposed road
TANESCO Infrastructure Relocation Approval	TANESCO-Regional Office	To wave away construction of the proposed road
IRUWASA Infrastructure Relocation Approval	IRUWASA-Regional Office	To wave away construction of the proposed road
Water Use & Discharge Permit	Rufiji Water Basin/MoW	To allow abstraction of water from Little Ruaha River for project construction
Clearance of Acacia Trees	Ruaha Forest Reserve/Ministry of Natural Resources	To wave away construction of the proposed road
TAZAMA pipeline/Infrastructure Relocation Approval	TAZAMA	To wave away construction of the proposed road

### 1.14 Policy, Legal & Administrative Framework

Several relevant policies and legal documents have been reviewed to ensure that “Upgrading of Ipogolo-Kilolo Road Project” meets policy and legislative criteria.

#### 1.14.1 World Bank Policies

World Bank's Environmental and Social Framework and its components [Vision for Sustainable Development, World Bank Environmental and Social Policy for Investment Project Financing, and Environmental and Social Standards].

#### 1.14.2 National Policies:

National Environment Policy 1997, National Employment Policy 2008, National Land Policy, 1997, The Construction Industry Policy 2003, National Mineral Policy 2009, Human Settlement Development Policy 2000, National Water Policy 2002, National Forest Policy 1998, National Agriculture Policy 2013, Agriculture and Livestock Policy 1997, National Action Plan to end Violence against Women and

Children (2017/18-2021/22), Policy on HIV/AIDS Policy 2001, National Energy Policy 2015, Women and Gender Development Policy 2000

### 1.14.3 Legal Framework:

Environmental Management Act (2004), Road Act (2007), Energy and Water Utilities Authority (EWURA) Act (2001), Water Resources Management Act No 11 of (2009), Mining Act 2010, Occupational Health and Safety Act (2003), HIV and AIDS (Prevention and Control) Act No. 28/08 (2008), Local Government Laws (Miscellaneous Amendments), No. 13 (2006), The Village Land Act (1999), (Identifying Considerations for Women), Land Act No. 2/04 (2004), Amendment of the Land Act (1999), Forestry Act No. 14 (2002), Antiquities Act (1964), The Standards Act No. 2 of 2009, Land Acquisition Act 1967, Revised in 2012, Contractors Registration Act (1997), Engineers Registration Act 1997 (Amendments 2007), Employment and Labour Relations Act (2004), Explosives Act (1963), Urban Planning Act (2007), Worker's Compensation Act (2008), The Sexual Offenses Act 1998, Law of Marriage Act, 1971, Law of the Child Act, 2009

## 1.15 Findings

### 1.15.1 Sensitivity Screening

The proposed project route does not fall within any threatened ecosystem, National Protected Areas, Focus Areas or areas of conservation planning Little Ruaha River that flows adjacent to and crossing Ipogolo-Kilolo road at Ndiwili village and Mbigwa River at Kilolo are classified as environmentally sensitive.

### 1.15.2 Climatic & Microclimate Condition.

The road construction and operation is expected to increase an average daily traffic which will automatically have significant impact on the climate of the area. Climate change might result into heavy rainfall and extreme temperature increase which can destroy the proposed road in future only if climate change adaptation measures shall not be taken into consideration on the design and construction of the proposed project.

### 1.15.3 Air Quality

From the measured data to define the road corridor air quality baseline conditions, it can be concluded that the main sources of air pollution at the moment in the project area are stationary sources i.e. fuel powered vehicles, and fugitive emissions from households in the settlements burning wood for heating.

### 1.15.4 Wind Speed & Direction

The predominant average hourly wind direction in Iringa is from the *east* throughout the year. An increase in maximum wind during project operation might lead to an increase in the number of road crashes. Safe driving practices should be observed during May-November.

### 1.15.5 Ultra Violet

The peak daily ultraviolet radiation level changes over the year. In Iringa, the minimum and maximum UV index are 4 and 6. Maximum UV effect is experienced in the months of September, November and August. UV is among the climate variable that will contribute to early aging of the bitumen for Iringa-Kilolo road. Climatic adaptation measures should be considered with regard to the effect of Ultra Violet on bitumen roads.

### 1.15.6 Clouds and Humidity

During operation of the road, clouds are expected to affect road users as it will reduce road visibility and likely to influence accidents. Precautions should be made to road users especially during December to May.



### 1.15.7 Noise & Vibration

It is anticipated that the night and evening noise levels will be even lower, considering the low density of population of these areas, the low frequency of vehicles during the night, and the fact that the population mainly work in the agricultural sector and carry out their core activities during the day.

### 1.15.8 Gender Based Violence

During focus group discussions organized in the villages along Iringa/Ipogolo-Kilolo Road project; the participants highlighted the two main causes of GBV in their communities/families. The first one is excessive consumption of alcohol among married couples and those in spousal relationships; Secondly, male domineering culture which is prevailing in the communities; whereby women are being overwhelmed by various tasks. Moreover, village chairmen and VEOs have revealed about frequency of GBV reported cases range from two to four times a month.

#### Existing GBV Situation on Project Communities:

##### (a) Awareness on Gender Based Violence

The participants indicated to know the meaning of gender based violence in their respective villages. According to them gender based violence is a practice of assaulting, humiliating and confronting male or female human in a family, community and nation at large. So, GBV implies the following:-

- Domestic violence
- Emotional violence
- Child labour abuse;
- Forced marriage of girls to spouses who are chosen by their parents

##### (b) Existing Forms of Gender Based Violence in Project's Communities/Families

According to participants of FGDs held during community consultation meetings forms of GBV are as follows:-

- Widows are denied inheritance of property based on a traditional mind-set and belief that women ought not to inherit, or share in property.
- Punishment to women i.e. divorce for not bearing children.
- Children lack parental love i.e. physical affection, considerate treatment, tenderness and being irresponsive.

##### (c) Reporting of Gender Based Violence Issues in Communities/Families

There are various levels where families/communities report GBV issues:-

- At family level; GBV issues are being reported to Ten Cell Leader
- At hamlet/sub-village/street level; GBV issues are being reported to hamlet/sub-village/street chairman/person
- At Village level; GBV issues are being reported to Village Executive Officer
- At Ward level; GBV issues are being reported to Ward Executive Officer, or Social Welfare Officer, and or Police Post for law enforcement
- From Ward to divisional level; GBV issues are being reported to Gender Desk at Police Station
- At District level; GBV issues are being reported to Social Welfare Officer at District Council level/ and District Court for legal action

##### (d) Assistance Which Communities/Families Get From Authorities to Resolve Gender Based Violence Issues

The authorities which are responsible for resolving GBV issues practice the following:-

- From Ten Cell Leader to Village Executive Officer; GBV issues are being handled by Social Welfare Office through peaceful resolution/ or conciliation between the two persons involved
- From Ward Executive Officer to Police Post/Station; GBV issues are being handled by Ward Council through filing a case to court of law for legal proceedings
- District Court; ruling of GBV issues is given against the persons involved

(e) *The Outcomes of Gender Based Violence Faced by Project's Communities/Families*

GBV outcomes can be positive and negative depending on the resolutions reached at different levels as indicated above:-

- Family separations/divorces
- Injuries
- The shrinkage of family income as the foundation is shaken with conflicts
- Children happiness and welfare is threatened and degraded
- School dropout for male and female children
- Reconciliation among two persons involved
- Fines are being imposed to the accused persons
- Jail sentence for accused persons

(f) *The Government Institutions/NGOs that Provide Support to Reduce/End GBV in the Communities/Families*

Government Institutions:

- At Ipogolo hamlet, Ruaha Ward in Iringa Municipal council they have established a Hamlet/Street Council for resolving critical social issues including GBV issues
- At Tagamenda Village, Luhota Ward, Iringa District Council, they have established a Village Social Welfare Committee responsible for resolving GBV issues
- At Kilambo Village, Magulilwa Ward in Iringa District Council they have established a Gender Desk and Social Welfare at Ward level responsible for resolving critical issues including GBV issues
- At Ndiwili Village, Magulilwa Ward in Iringa District Council they have established a Village Committee for resolving critical issues including GBV issues
- At Luganga Village, Mtitu Ward in Kilolo District Council the village leadership is working closely with District Council Social Welfare Office and Police Force for resolving GBV issues
- At Utengule Village, Ihimbo Ward in Kilolo District Council they have established a Village Moral and Ethics Committee which closely with Police and Court to resolve GBV issues

NGOs:

- BRAC, ALAMANO, IDYDC, FISH, SAFINA, Paralegal, Anglican and Lutheran Churches Compassionate Groups have been providing support in Ipogolo Hamlet, Ruaha Ward in Iringa Municipal Council
- WOPATA providing Gender Education and TAROC have been providing support in Tagamenda Village, Luhota Ward in Iringa District Council





- ALAMANO “Kizazi Kipya” programme which is financed by PACT has been providing support in Ndiwili Village, Magulilwa Ward in Iringa District Council
- SPW/Restless Development has been providing education on mother and child rights, and APLHA has been providing education on Gender and Health have been providing support in Utengule Village, Ihimbo Ward in Kilolo District Council

### 1.15.9 Regional per Capital GDP

Agriculture is the largest sector and a major source of Regional economy (more than 80% of the population and 75% of Regional GDP) followed by timber production, livestock keeping and fishing. Maize is the major staple food crop which also contributes significantly to the household income. Other food crops of importance include paddy/rice, round potatoes, sweet potatoes, beans, soya, sesame and vegetables.

The socio-economic survey revealed that 87.8% of the interviewed households solely depend on agriculture as their source of income. Other groups depend on agriculture but also are involved in other activities like small business, formal employment (teachers, village government officials) as well as livestock keeping.

Eighty percent of the respondents reported to earn below 100,000 Tshs per month, followed by 9% who earn between (100,000 to 500,000 Tshs per month) and (500,001/- - 1,000,000/- per month). Lastly 2% reported to earn above 1,000,000/- Tshs per month.

### 1.15.10 Access to Clean and Safe Water and Sanitation

Generally, water used by villagers along the Ipogolo-Kilolo road is not safe, villagers reported to experience water related diseases such as diarrhoea, intestinal worms and typhoid.

Sanitation facilities give an indication of health status, as well as socio-economic development. Most of the households along the road use pit latrines with temporary structures including walls and roofs. Majority of the household dispose the domestic wastes in pit holes (97.8%), although in some households they throw in farms (2.2%).

### 1.15.11 Health Services

The accessibility to health facilities in the project area is good since almost every village consulted has dispensary. Villagers do walk about 1 – 5 km to reach a dispensary. The hospitals are found at Kilolo and in Iringa Municipal. In the course of the survey, the Consultant learned that access to modern treatment was inaccessible to many households due to high cost of treatment. The medical personnel are inadequate and under qualified.

### 1.15.12 Diseases & HIV/AIDS Prevalence

The major diseases found in communities along the road corridor include malaria, diarrhoea, respiratory infections including coughing, and TB, pneumonia and skin diseases. Malaria is a main killer disease in the project area.

With respect to HIV/AIDS infection in Iringa and Kilolo Districts, HIV/AIDS infection rate is high (9.1%). Based on the information gathered, the prevalence is 5.1%.

### 1.15.13 Waste Management & Disposal

In the project area solid waste management practices involve collection of solid wastes and disposal to Kihesa dumpsite located along Dodoma road. This is practiced in Ipogolo among the other project's villages. Tagamenda and the rest of the villages use onsite disposal and burning.

Liquid waste management is practised through onsite disposal for all project's villages.

### 1.15.14 Off-Site Facilities

#### (a) *Borrow Pits for Sand*

Sand borrow pits at Tagamenda village are located on the South East and approximately 1.2km from Kitayawa centre and about 800m from the nearest settlement Both pits on LHS and RHS of Iringa/Ipogolo-Kilolo Road are active and used to supply the valuable construction material (sand) to Iringa people.

They mainly comprise of whitish natural coral stone with reddish clayey silt. The borrow pits were used to repair nearby roads. They have extension potential of about 50m each side. The borrow pits site has overburden material of varied thickness ranging from about zero to 0.25m thick. The average depth of the material is about 1.2m with an estimated quantity of over 15,000 m<sup>3</sup>.

The areas have no sensitive flora species, only grasses and few regenerating trees were observed during the study.

Topography of sand sources is described to be flat and no any kind of surface water source is located near the borrow areas. Sand borrow pits have an approximate area of 16acres in total.

#### (b) *Borrow Pits for Gravel*

Chama/Italula borrow pit mainly comprises of reddish brown clayey silty GRAVEL. The borrow pit is active and currently used to supply materials for regular maintenance of the roads in Iringa and Kilolo districts. It has extension potential of about 50m each side. The borrow pit site has overburden material of varied thickness ranging from about zero to 1.5m thick. The average depth of the material is about 0.9m with an estimated quantity of over 15,000 m<sup>3</sup>. Total estimated area covered by the borrow pit is 12acres.

The borrow pit is situated close (at 60m) to residential houses and 1.5km on the South of Little Ruaha River.

Lulanzi borrow pit mainly comprises of reddish brown clayey gravelly silt. The borrow pit was used to repair nearby roads. It has extension potential of about 100m each side with an estimated area of 10acres. The borrow pit site has overburden material of varied thickness ranging from about 1.4m to 1.6m thick. The average depth of the material is about 2.5m with an estimated quantity of over 250,000 m<sup>3</sup>.

The pit area has some matured pine trees and no water source is located nearby. The nearest residential house is located about 70m on the East of the borrow pit.

The study found sand borrow pits located more than 1km from residential houses while gravel pits were 60-70m from residential houses. The average minimum distance for borrow pits as per Occupational Safety and Environmental Protection Regulations, 2010 is 100m from residential houses.

#### (c) *Quarry Sites*

Mazombe quarry site is located approximately 570m on the West of Mazombe settlement, has an average size of 36acres. There are no water sources close to the site and no vegetation within the quarry site.

Ndolela community is located on the West and South of quarry site, the nearest residential house is approximately 100m South of the quarry. Neither vegetation nor closest water source were observed during the study. The quarry area is estimated to be 9acres with an average resource of 115,000m<sup>3</sup>.

Whenever blasting occurs on site, vibration is of consideration particularly as the mining industry permits blasting to within 150 m of dwellings [the ppv (peak particle velocity) can be controlled to an acceptable level for dwelling to within 150 m].

During the study, both quarry sites were not operational. The sites are legally owned by TANROADS and are strictly used for its projects.

## 1.16 Stakeholders Engagement Methodology

### 1.16.1 Stakeholders Identification

The main stakeholders for upgrading of Ipogolo-Kilolo road project include; Regional Secretariat of Iringa (RAS-Iringa Region), TANROADS, TANESCO-Iringa Region, Regional Traffic Office-Iringa Region, District Commissioner's Offices;-Kilolo District, Iringa District, Iringa Municipal Council, TTCL-Iringa Regional Office, Rufiji Water Basin (MoW)-Iringa, IRUWASA, CDTI, Tagamenda Secondary School, Tagamenda Primary School, Kitayawa Primary School; Kilambo Primary School, Ndiwili Primary School, SAGCOT Ihemi Cluster, GBRI Farm-Iringa, ALAMANO Centre-Iringa, TAHESA-Iringa, Iringa District Council, Iringa Municipal Council, Kilolo District Council, TAZAMA Pipeline; and communities in 6 villages located along the road (road users: bodaboda/bajaj drivers, traders, commuter bus drivers, cattle herders, people with disabilities, school children and teachers, women and children, religious leaders) to mention the few.

### 1.16.2 Major Issues Raised By Stakeholders

The stakeholders in the project area raised the following issues;

1. **Economic Benefits to be Realized after Completion of Road:** Good road with tarmac will bring various economic benefits to communities living along or near the road. These include; lowering of transport costs i.e. fares will go down from current bus fares of TShs. 2,500/= from Ipogolo – Kilolo ( length of 33.61 kms) , more buses with good condition will be travelling through this road, reduced soil erosion during rain season, low costs of transporting crops from Kilolo to Iringa and hence lower the prices of crops at market in Iringa municipal, reduced travelling time, increase in number of tourists visiting Udzungwa National Park since the proposed road is a short cut from Iringa compared to using Mikumi-Ifakara road
2. **Proposed Road Design:** To widen road alignment that will accommodate trucks, pedestrians, bicycles and motorcycles, the tarmac road that will accommodate livestock's crossings, zebra crossings in areas with public institutions like schools, checkpoints, markets i.e. Tagamenda and Kilambo villages. The weighbridge to be built to limit the tonnage of trucks carrying crops and timber, road signs for specific groups i.e. the deaf, the blind, Mobile weighbridge to be installed at Tagamenda before these trucks reach TANZAM Highway at Ipogolo, weighbridge to be placed at crops and forest produce levy collection point located near River Ruaha Bridge-Ndiwili village. Bus bays to be placed near junctions schools paths/entrances i.e. Tagamenda Secondary School, Tagamenda Primary School, Kitayawa Primary School, Kilambo Primary School, Luhota Secondary School, Magulilwa Secondary School and Muhwana Secondary School; to institutions i.e CDTI-Tagamenda, TANESCO Power Station-Tagamenda, Dabaga Bus Stand at Ipogolo township. Also contractor should build a breathing space along the road
3. **Avoid Disruption of Essential Services by Damaging the Public Facilities:** Some of the services that are being provided to the communities i.e. water supply, electricity, telecommunication and fuel pumping from Dar-es-Salaam to Zambia will be affected/ or disrupted by the road construction.



River Little Ruaha is the main source of water for residents of Iringa municipal; it has steep banks susceptible to erosion. There is water gauging meter located at the LHS of the Ndiwili bridge. There is also water gauging meter located at Ndiuka in Ruaha Ward along TANZAM Highway; Rufiji Water Basin is planning to relocate the meter to beneath the bridge connecting Igumbilo and Tagamenda; River Little Ruaha has the tendency of overflowing towards the road during rainy seasons. Avoid debris accumulation; the contractor should not treat River Little Ruaha as a dumping place. Water Abstraction Point for construction; to consider on areas far from water intake for community use. To abide to Environmental Act and Guidelines which restrict human activities to be taking place inside 60 meters from water highest mark.

4. **Relocation of Properties within Road Reserve:** Expropriation of project affected people's properties, especially houses and farms. This issue is key and extremely sensitive since it is very costly with prevailing financial circumstances for an individual to put up a house structure. They are assets which is highly valued by the communities
5. **Criteria for Location of Campsites:** Local people should be involved in the selection of the camp site/s. The contractor's camping site/s should be constructed with permanent building materials. The idea is to use these structures for public services e.g. schools or village office at the end of the project construction phase.
6. **Spread of HIV/AIDS and Other Sexually Transmitted Infections:** Impaired community safety and risk of disease intensifications, especially HIV/AIDS. TANROADS to officially make a formal contract with institution that will be carrying out the HIV/AIDS preventive campaign through dissemination of relevant and appropriate HIV/AIDS preventive awareness creation seminars, campaigns should be to both workers in particular and the communities, effective collaboration with CMACs and other stakeholders is paramount for result based HIV/AIDS awareness creation campaigns during construction of the road
7. **Gender Based Violence:** Based on the experiences gained from the rise on incidences of GBV from other road construction projects, community members expressed their concerns that during road construction more people will come to work in the project area and hence may likely fuel gender based violence in their communities as a result of interactions of people from different cultural backgrounds. They call upon the contractor to emphasize employees of the project to respect to human dignity by abiding to traditional customs and norms instead of being the cause of fuelling of GBV related issues in the project area.
8. **Early Pregnancies for School Female Children:** It has been insisted by stakeholders that most of road construction projects have been a major cause of early pregnancies for school female children. The stakeholders proposed some measures to address the situation i.e. parents should instil a culture of educating their children on sex and reproductive health education, abiding to moral and ethical values and also parents should behave responsibly as role models with whom the children can emulate them.
9. **Road Safety Awareness Creation to the Communities:** It has been always observed and witnessed the increase in number of road accidents which are fatal and leave affected with disabilities after the tarmac road is constructed; as proposed tarmac road will claim people's lives through accidents. The contractor/TANROADS to train villagers/communities' leaders on Road Safety Campaign so that they will key community educators to road users by disseminating relevant, right and appropriate information, education and communication to the communities' members. This goes in conjunction with placement or installation of clear and understandable road signs (preferably in Kiswahili), use of speed humps at villages and general traffic police surveillance.



10. **Growth of Town/Villages:** The project will fuel growth of towns and village located along the road. These towns should be assisted by the government in planning (e.g. land use and plot surveying) in order to curb unplanned growth of settlements which directly affect the accessibility of essential public services like supply of clean water and managing waste generated by residents of respective towns and villages along the road.
11. **Recruitment of Local Labourers during Construction Phase:** Each village being transverse should be given first priority in the provision of unskilled and semi-skilled labourers in the project. The contractor should therefore adhere to local content policy in executing the project during recruitment of labourers and commodities and services supply chain.
12. **Insurance of Workforce:** Experience gained from other foreign contractors is that they do not provide workplace insurance for casual labourers. In accordance with existing labour laws, TANROADS should enforce the contractors to abide with existing laws of the land in safeguarding safety of entire workforce at the construction site to make them well covered by appropriate insurance policies.
13. **Improved Accessibility:** The road will guarantee easy accessibility of road transportation of goods, commodities and people hence therefore enabling more physical development.
14. **Dust Production, Noisy and Blasting of Rocks during Construction:** Dust production, noise from moving construction equipment / machines and blasting of rocks are inherent to all road construction works. The contractor must have means to suppress the dust, reduce the level of noise and provide early notification to the communities about the proper time of blasting rocks to obtain gravels.
15. **Building Culture of Protecting Road Infrastructures After Completion of Construction:**  
It was urged by stakeholders that there is a need of cultivating a culture of safeguarding and protecting the project infrastructures among communities' members especially after completion of road construction. It has been noted in other areas that people have been vandalising road infrastructures i.e. bolts, nuts tied in bridges by selling them as scrap metals.
16. **Environmental Safeguard and Sustainability:** storm water channels should not be directed to farms since such practice has damaged crops and farming land due to accelerated erosion. It should be directed to the proper water channels that are not polluting environment. Also leakage of diesel, oil and other lubricants from construction equipment and machines to road surface and in water sources should be avoided.

## 1.17 Identification Methods of Project Impacts

### 1.17.1 Matrices (Activities-Environment Interactions)

Interactions between the project activities and the environment were identified for each stage of the project, by using a matrices

### 1.17.2 Focused Approach Impacts Mapping/Identification

This is a collaborative process of reflecting the reality along the proposed road's sections in order to find implementable solutions/mitigations to avoid or reduce the impacts.

#### 1.17.2.1 Climate & Microclimate

Impacts on the microclimate and meteorology of the local area will be negligible since there will be minor changes in surface reflection and no aerodynamic disturbances.



### 1.17.2.2 Air Pollution

Traffic jams that may occur during construction are considered as indirect source of emissions in the air especially at Ipogolo/TANZAM roads. This negative impact has been estimated as temporary with a medium size.

### 1.17.2.3 Noise & Vibration

Construction of the Ipogolo-Kilolo is linked to a series of activities that cause vibrations as a consequence of using construction mechanisation.

It is expected that the impacts from vibrations will be insignificant, mostly localized, at the construction sites and limited to the local workers as well as the local species.

### 1.17.2.4 Impact on Soil Structure/Topography

The soil may be polluted by inappropriate storing, handling and depositing of waste, as well as by potential leakage of oils during the construction activities.

The impact during the construction phase on soil pollution is assessed as negative with insignificant size and of temporary character.

### 1.17.2.5 Soil Erosion

The construction of the proposed alignment will therefore mark the beginning of the race between soil stabilizing factors such as vegetation cover and others which seek to destabilize the existing balance such as increased surface runoff and evaporation.

During construction, soil erosion is expected to be low

### 1.17.2.6 Impact on Surface Drainage /Hydrology

Changes to the natural drainage system may also occur due to the interception and redirection of the natural watercourses in order to construct drainage structures or the substructure of bridges. The effects of these activities are likely to last throughout the operational phase.

The rivers pollution and hydrological impacts are considered to be low to moderate as a result of the project activities.

At Igula market/ road section between Tagamenda and Kilambo villages is a drainage pattern which flows into Little Ruaha River. No historical records of floods on the area but precautions should be taken into consideration on the design of the road taking into account climate change adaptation measures.

### 1.17.2.7 Impact on Vegetation Coverage

During the construction phase of the project, there will be clearance of vegetation along the RoW, however minimal, to pave way for contractor's camp/s and borrow pits. This will lead to the negative impacts to the environment. This impact will be low though there is necessity to clear vegetation existing in the road reserve.

### 1.17.2.8 Change of Land use

The land-use in the project area is mainly for agriculture, commercial and residential. With the implementation of the project, the rural areas may get urbanization gradually in the long run and this could introduce secondary impact which might change the existing land use. The impact will be of medium magnitude.

### 1.17.2.9 Land Acquisition & Resettlement

Prediction and evaluation (*impacts characterization-Table:6-10*) indicates that resettlement impact has an overall score of -28 (*see Table:6-9*) which is low/acceptable. Residual impacts are expected after mitigation which is also considered of medium significance.

### 1.17.2.10 Impact on Employment

It is expected the construction phase will create employment opportunities and will have a medium magnitude.

### 1.17.2.11 Traffic & Road Impacts

A number of factors that increase a pedestrian's exposure to risk are expected, and they include issues related to:

- **Driver behaviour:** Speeding, drinking and driving, distracted driving and failing to respect a pedestrian's right-of-way.
- **Pedestrian behaviour:** Alcohol-impaired walking, distracted walking, a lack of ability to be seen in certain conditions and failing to abide by road signs and signals.
- **Road design:** Failure to prioritize the needs of pedestrians in road design by providing safe, accessible, and comprehensive facilities and services, such as sidewalks, raised crossings, raised medians and inadequate roadway lighting.

This is likely to cause an additional casualties and fatalities per year at the start of the operational phase. The significance of the negative impact on road safety is therefore assessed to be high without measures/mitigation. As the vehicles volumes increase annually, the accident rate will also increase proportionately.

### 1.17.2.12 Occupational Health & Safety Impacts

In order to avoid and prevent potential adverse impact on the local communities caused by workforce influx, there will be low occurrence of off-site accommodation, i.e within the communities. The road project shall require temporary land acquisition for the construction of camp/s.

### 1.17.2.13 Impact on Local Life Style

Most of construction activities as a source of air pollution will be located outside the settlements. Due to this the impact shall cause only small alteration of Quality of life thus the impact magnitude is estimated to be low.

#### (1) Noise

Due to this, the impact will cause partial loss in Quality of life but it will not adversely affect the integrity. Thus the impact magnitude is estimated to be low.

#### (2) Safety

Construction traffic will have temporary impacts on the traffic network of the area i.e Ipogolo & kilolo centers, generating increased traffic risks and accidents. Due to this, the impact will cause partial loss in quality of life but it will not adversely affect the integrity. Thus the impact magnitude is estimated to be medium.

#### (3)Improvement of Quality of Life Due to Changes in Economic Well-Being

It is estimated that improvement of economic wellbeing as a result of the road operation will impact the quality of life with medium magnitude, by causing improvement of receptor quality.

During the operational phase, the local economy will benefit through some employment opportunities through development of local economic activities like agriculture, forestry, tourism e.t.c due to better access to newly opened markets locally and nationally. Passengers should save money due to the cheaper transport.

#### **1.17.2.14 Gender Based Violence & Equality**

Gender and equality biases in road projects may be the basis of differential treatment of persons based on their sex roles, ethnicity, status, religion, race, age, beliefs and disability among other attributes. The impact magnitude is expected to be low of longterm duration

#### **1.17.2.15 Spread of HIV/AIDS**

The HIV/AIDS spread impact on the Ipogolo-Kilolo road project is considered to be long terms with medium significance

#### **1.17.2.16 Cultural/Religion Values**

Disturbance of burial ceremonies and demolition of mosques are expected during construction phase.

The magnitude of the impact on the burial ceremonies are expected to low and short term while demolition of mosques is considered to be medium and longterm.

#### **1.17.2.17 Climate Risk Vulnerability Assessment**

Climate change will directly affect the proposed road infrastructure in several ways. High temperatures will cause road to easily develop cracks within a short period after their construction. Furthermore, higher temperatures combined with increased solar radiation (UV) may reduce the life of the proposed asphalt road surface. Additionally, high precipitation will allow new road to easily develop potholes.

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

### **1.18 Environmental and Social Management Plan (ESMP)**

The proposed mitigation measures provide the basis for the development of environmental management plan and monitoring plan for the Project, required to meet World Bank's and NEMC's environmental approval and permitting requirements as indicated on tables 7-1 & 8-1 of the main report.

### **1.19 Summary and Conclusion**

The proposed project has undergone ESIA study as legal requirement under the National Environmental Management Act, 2004 as well as World Bank's requirement as stipulated in Environmental and Social Framework, 2018.

Environmental and Social Impact Assessment study was conducted from March 2019 throughout July 2019 which involved collection of baseline information including secondary data, focused approach impacts mapping, engagement of communities along the proposed road i.e. Ipogolo, Tagamenda, Kilambo, Utengule, Ndiwili, and Luganga villages, impacts identification, impacts evaluation and preparation of Environmental and Social Management Plan.

Impacts identified include various categories; physical, biological, social, economic and climate change risks. Evaluation of impacts indicates low magnitude on physical and biological negative impacts. Positive economic impacts are anticipated to be of medium magnitude. Most of Social negative impacts





scored low magnitude except those related to Road Users Safety. Evaluation of climate change vulnerability risks indicates medium impacts only if climate adaptation measures will not taken into account in the road design.

As described in chapter 4 of this report, trends of climate change variables in the project area are varying from year to year, rain/precipitation, temperature and ultraviolet index are expected to increase in future, and functionality of the proposed road might be under threat of climate change.

Among the proposed measures includes provision of road's visibility, safety markings and signs in the design as well as proper road design to withstand climate change scenarios, provision of water drainage structures with capacities to allow free flow of runoff from either sides of the road, safety and health trainings to the workers and communities and fair valuation and compensation to the project's PAPs.

It is, therefore, concluded that, implementation of the proposed project will not cause significant impacts provided that the recommended mitigation measures are adequately and timely put in place. The identified adverse impacts shall be managed through the proposed mitigation measures and monitoring schedules outlined in chapters 7 and 8 of the main report.

