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PROJECT: DODOMA CITY OUTER RING ROAD (110.2KM) UPGRADING PROJECT, DODOMA REGION

COUNTRIES: TANZANIA

ESIA SUMMARY FOR THE PROPOSED UPGRADING OF THE DODOMA CITY OUTER RING ROAD (110.2KM) TO BITUMEN STANDARD, DODOMA REGION, TANZANIA

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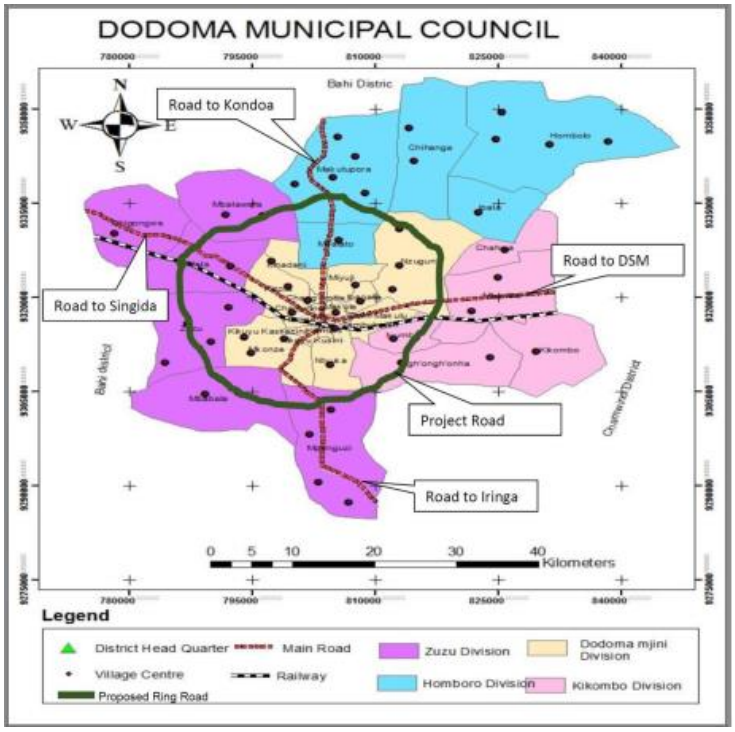
PROJECT TITLE:	**DODOMA CITY OUTER RING ROAD (110.2 KM) UGRADING PROJECT (TO BITUMEN STANDARD)**
PROJECT NUMBER:	**P-TZ-DB0-025-03**
COUNTRY:	**TANZANIA**
CATEGORY:	**1**

1. INTRODUCTION

1.1. The Government of the United Republic of Tanzania with the assistance from African Development Bank (AfDB) intends to upgrade the Dodoma City Outer Ring Road (110.2 km). The project is being implemented by Tanzania Roads Agency (TANROADS). TANROADS is an Executive Agency under the Ministry of Works, Transport, and Communication; established under the Executive Agencies Act in 2000, with the duty of maintaining and developing trunk and regional road network in Tanzania Mainland. In broad terms, improvement will involve a construction of new road. The rehabilitation and/or replacement of existing drainage structures and the construction of new, additional drainage structures are also important features of the proposed works.

1.2. When the Ring Road is completed, it shall allow traffic not destined for Dodoma City to bypass the City along a number of high-speed freeways in a quick and easy fashion. It is expected that heavy vehicles entering the Dodoma City from the four main trunk roads will be diverted into the ring road either to bypass Dodoma completely or to transfer to another radial route to suite their eventual destination and in doing so avoid the town center. There will also be transfer of traffic to the ring road from the traffic that currently uses a network of roads within the town. Below is the map of the proposed road.



1.3. Locational Characteristics: The project road starts at Veyula settlement located along the Dodoma –Kondoa trunk road traverses south east towards Ihumwa settlement located along Dodoma-Morogoro trunk road. From Ihumwa the project road traverses towards south to the Matumbulu Settlement along Dodoma- Iringa trunk road then it precedes North West to Nala **settlement located along Dodoma –Singida trunk road before it completes the ring at Veyula.** The Dodoma Region lies in the heart of Tanzania in the eastern-central part of the country. The region, which is primarily semi-arid, covers an area of 41,311 square kilometres (15,950 sq. mi). The region is bordered by the Manyara Region to the north, the Singida Region to the west, the Iringa Region to the south, and the Morogoro Region to the southeast. Dodoma Municipal is one of the seven districts of the Dodoma Region of Tanzania. It is bordered to the west by Bahi District and to the east by Chamwino District. Its administrative seat is the city of Dodoma. It lies between Latitudes 6.00º and 6.30º south, and Longitude 35.30º and 36.02º East. It is 456 kms to Dar es Salaam and 426 kms to Arusha.

1.4. Categorization: In accordance with the laws and environmental guidelines in force in Burundi, as well as with Bank's ISS policy and Environmental and Social assessment procedures, the project is classified as Category 1. The justification for this categorization relates to: (i) the scope of the project (above 50 km); (ii) the presence of environmental sensitive receptors in the Project area; (iii) and the number of Project affected Persons (PAPs) which is above 200.

1.4.1. ESIA Requirements: As a category 1 Project a full environmental and social impact assessment has to be undertaken to effectively inform the projects design and leverage the projects compliance to both national and international requirements. The Environmental Impact Assessment has been conducted in accordance with the requirements of the Environment Management Act No.20 of 2004 and Environmental Impact Assessment and Audit Regulations (2005). The Regulations give mandate to NEMC to oversee the EIA

process, which culminates with an award of the EIA Certificate by the Ministry responsible for Environment. The EIA Certificate is among the prerequisite approvals required before the project takes off. This project will need this approval before it is implemented.

1.4.2. RAP Requirements: Realignment of the road, borrowing of naturally occurring construction materials, and construction of camps outside the Right of Way (RoW) will cause loss of properties in terms of buildings and land. Affected people will have to be compensated because payment of compensation is both a legal and constitutional right under Article 24 of the Constitution of the United Republic of Tanzania of 1977.

1.5. The scope of the study included the Direct Impact Zone (DIZ) and the Area of Influence (AI). Direct Impact Zone (DIZ) - This is the Right of Way of the proposed Project Road which includes 75m from the centreline (150m in total), 150m on both sides for the four major junctions, borrow pits, quarry sites, campsites etc. Immediate Impact Zone (IIZ): These are immediate surrounding areas about 500m on both side of the proposed road (villages/mitaa along the road). Area of Influence (AI): - This covers the wider geographical areas that are influenced by this Project (e.g. Dodoma City).

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Sustainability Triggers: The National Environment Policy (NEP, 1997) is the main policy document governing environmental management in the country. The policy addresses environmental issues as both natural and social concerns, and adopts the key principle of sustainable development. The policy requires ESIA to be mandatory for all development projects which are likely to have significant environmental impacts. The intention is to ensure that the development projects are implemented in an economically sustainable manner while safeguarding environmental and social issues for the benefit of the present and future generations. This ESIA has been carried out to fulfil the requirement of the policy, since the proposed road project is likely to have significant adverse impacts to the environment.

2.2. The National Water Policy, 2002 recognizes the role of road transport system as one of the effective tool in the implementation of water resource management activities. The project are has water scarcity and therefore if not well managed degradation of scarce water sources will have serious impact to the communities. During construction the Contractor shall ensure construction activities do not cause pollution of water source. **The National Forestry Policy of 1998 calls for environmental assessment of any investment which** would convert forest land to other land use or may cause potential damage to forest environment, this road upgrade is likely to cause clearing trees from exotic tree forests that are located along the project road.

2.3. The ESIA is **guided by the National Human Settlement Policy, 2000** whose overall goal of the policy is to promote development of sustainable human settlement and to facilitate provision of adequate and affordable shelter to all people, including the poor. During construction, residents living in the neighborhood of the project are likely to be affected due to deterioration of ambient air quality by smokes and dust due to increased movement of construction machinery and equipment; and vehicles. Improved accessibility to forests is likely to increase due to improved road and hence increased harvesting of trees for firewood, charcoal, and timber production. These impacts have to mitigate. **The National Land Policy, 1995 (Revised in 1997) emphasizes** on the protection of environment and natural ecosystems from pollution, degradation, and physical destruction. In line with this required, this ESIA

documents the measures that will be implemented during the construction including sustainable disposal of waste and minimized disruption to water utilities across and within the RoW in order to avoid limiting community access to social services.

2.4. The socio-economic triggers for this project lie in the National Policy on HIV/AIDS, 2001 which recognizes the linkage between poverty and HIV/AIDS, as the poor communities of the society are very vulnerable. During project implementation of the project influx of people in the project area could accelerate the spread of the disease. In order to contribute towards observing the objectives of the National Policy on HIV/AIDs, the project Contractor will be required to have HIV/AIDs programme aimed at promoting awareness of HIV/AIDs among its service providers and its employees, despite that the HIV/AIDs knowledge is known to most of people. Also, the **National Gender Policy, 1992 (Revised 2002)** requires that project management to ensure that gender issues are given emphasis. It also requires that women and men are given equal employment opportunities in the project, whenever possible. During construction, the contractor will have the obligation to ensure that as much as possible men and women are given equal opportunities during recruitment of construction workers. The ESIA was further guided by the **National Poverty Reduction Strategy, 2003, which** provides emphasis is on the growth momentum to fast track the targets of vision 2025 for high and shared growth, high quality livelihood, piece, stability and unity, good governance, high quality education, and international competitiveness. Other policies triggered include the Tanzania`s Property and Business Formalization Programme (TPBP) and the Tanzania Agricultural and Livestock Policy.

2.5. The legal framework to address the social dimensions, impacts, and implications of the project includes the Constitution of the United Republic of Tanzania of 1977, the Environmental Management Act 20, 2004, The Water Resources Management Act (2009), which repeals the Water Utilization (Control and Regulation) No 42 of 1974, The Land Act Cap. 114 (No.4), 2004 (Amendment Land Act, 1999). The Village Land Act Cap 114 (No. 5 of 1999) confers the management and administration of village lands to Village Councils, under the approval of the Village Assemblies, although the Minister of Lands is entitled to decide on the amount of land which can be owned by a single person or commercial entity. The involuntary resettlement triggers include the Land Acquisition Act, 1967 (Revised Edition 2002) whereby although the majority of the road will follow the existing alignment, there are sections where realignment of the road and so land acquisition will be inevitable in order to improve the safety of the road. In addition, land acquisition will be necessary for borrowing of naturally occurring construction material such as sand, gravel, and hard stone. The Contractor shall comply with all the above requirements of the Occupational Health and Safety Act No.5 of 2003 as well as the HIV and AIDS (Prevention and Control Act, 2008) and the Road Act No. 13, 2007. Regarding heritage resources the ESIA was guided by the Grave (Removal) Act No. 9 of 1969 (Revised Edition, 2002, Cap. 72).

2.6. Other instruments include Employment and Labor Relations Act, 2004, Public Health and Safety Act No. 1, 2009, Workers' Compensation Act No. 20, 2008, Occupier's Liability Act No. 54, 1968, the Forest Act No. 14, 2002, the Explosives Act (Cap 45) (No. 56), (Revised Edition, 2002), Land use Planning Act No. 6, 2007, The Mining Act, No. 14, 2010, Antiquities Act No. 22, 1964 (Revised Edition: 2002) amongst others.

2.7. The project triggers all the Operational Standards in the African Development Bank's Integrated Safeguard Policy including

- *Operational Safeguard 1*: Environmental and social assessment – The project is Category 1 requiring a full environmental and social assessment.
- *Operational Safeguard 2*: Involuntary resettlement land acquisition, population displacement and compensation – The project will lead to involuntary resettlement and a resettlement action plan has been developed.
- *Operational Safeguard 3*: Biodiversity and ecosystem services – The project location includes water systems, forests and communities, the application of the mitigation hierarchy is key in ensuring the sustainability of the project
- *Operational Safeguard 4*: Pollution prevention and control, hazardous materials and resource efficiency – The project will handle hazardous waste that has to handled well in order to minimize pollution
- *Operational Safeguard 5*: Labor conditions, health and safety – The project is implemented through a contract and workers welfare and safety is key to the successful implementation process.

2.8. The administrative and institutional arrangements for environmental management for all sectors in Tanzania are stipulated in the Environmental Management Act No. 20 of 2004. There are seven (7) institutions mentioned by the act, of which the Minister Responsible for Environment is the overall in-charge for administration of all matters related to the environment. The legal institutions for environmental management include the National Environmental Advisory committee, the Minister responsible for Environment, VP Office, The Director of Environment, National Environment Management Council (NEMC) and Sector Ministries. The Regional Administration Act No. 9 of 1997 provides for Regional Commissioners to oversee Regional Secretariats, with District Commissioners directly supervising the District Councils. Local authorities oversee the local planning processes, including establishing local environmental policies.

3. DESCRIPTION OF PROJECT AND JUSTIFICATION

3.1. Project Location: Dodoma town was declared the National Capital under The Presidential Decree No.320 of 1973. Since then, a series of successful stories have followed. In 1980, Dodoma City was established and in 1995 the Government decided that all parliamentary activities should take place in Dodoma and consequently The Tanzania National Assembly moved to Dodoma in February 1996.

3.2. The city of Dodoma covers the Capital District which is an area earmarked for the Capital Development Area. The area involved includes the area earmarked for urbanization to a population of 1,000,000; future International Airport, underground water catchment area; agriculture and livestock grazing area, a forestation and conservation areas; and other necessary institutional and service facilities. Numerically therefore Dodoma Municipal covers an area of about 276,910 hectares, (equivalent to 2,769 sq. km), radiating 30-40 kilometres in each direction from the present centre of the existing town. It is the smallest district in Dodoma region representing 6.3% of the total area. Dodoma City is administratively divided into one parliamentary constituency, 4 divisions, 41 wards, 18 villages, 170 mitaa and 89 hamlets.

3.3. Design Concept: Pertinent features of the road design include: a.) the width of the bitumen carriageway will be 6.5m. b.) The width of the (paved) shoulders will be 1.5m. c.) A road reserve corridor of 75m. d.) At the 4 major junctions a reserve of 150m on both side of the

road will be maintained. d.) Cross-drainage structures, intersections and ancillary road works and e.) The road will have 20-year design life.

3.4. Mobilization and Preconstruction (4 months): This phase entails mobilization of labor force, equipment and construction of offices/campsites as well as acquisition of various permits as required by the law. Other activities during this phase include Topographical Survey, Geo-technical Investigation, Soils and Construction Materials Investigation, Land acquisition (If any), material storage and material preparation, Identification sources of material including and source of water.

3.5. The construction phase of the Project, which is estimated to take 3 years includes major construction activities such as;

- Extraction and transportation of materials (gravel, sand, hard stones, aggregates, water and bitumen)
- Clearing the Corridor of Impact (CoI).
- Construction of drainage structures
- Formation of the road embankment, establishment of sub-base and base, road surfacing
- Construction of bus bays
- Installation of road furniture
- Pedestrian Crossings, Speed Humps and Rumble
- Strips shall be provided in all built up areas, near schools and trading centers
- The landscaping of areas covered by the project road and establishment of vegetation for functional and aesthetic purposes on cut and fill slopes
- The final finishing and cleaning up of the road after construction, treating of old road and temporary diversions.

3.6. Decommissioning Phase: After completion of road construction, Engineer's camps shall be reverted to the TANROADS who will decide on their future use. However, Contractors' camps shall be closed out. The main activities during demobilization phase, which will take 3 months, will entail the following:

- Demobilization of temporary structures will be done for proper restoration of the site (e.g. removing/spreading top-soils piled along the road, removing all temporary structures, sites offices may be left to the local governments depending on agreements that will be reached during the mobilization phase.
- Other activities include rehabilitation of the workshop and stockpile yard, rehabilitation of site at least to the original condition, clearance of all sorts of wastes including used oil, sewage, sewage, solid wastes (plastics, wood, metal, papers, etc).
- Deposit all wastes to the sanitary landfill at Chidaya
- Restoration of water ponds to a natural and useable condition
- Termination of temporary employment.

3.7. Required Site Investments: *The main construction materials* for the road include sand, gravel, hard stones (aggregates), reinforcement iron bars, water and bitumen. Most of the materials shall be obtained locally (within Tanzania) except bitumen which shall be imported. Material investigations have been made with the aim of identifying sources for suitable

construction materials including borrow pits, sand pits, construction water sources and quarry sites.

3.8. Water: Due to geographical nature of Dodoma region, there is no any perennial water source identified along the route, thus the only water sources identified and sampled for laboratory testing is from DUWASA located at town center.

3.9. Other site investments will include Fuel storage tanks; Storage facilities for construction materials (cement, bitumen, paints, steel, timber etc.); Mechanical workshop for repair and maintenance of construction machinery, equipment, and vehicles and Accommodation and offices for the Contractor and Engineer (Engineer) key and support staff.

4. DESCRIPTION OF PROJECT ENVIRONMENT

4.1. Spatial Boundaries: The ESIA focusses on the Right of Way, potential sources of naturally-occurring construction materials (water, gravel, crushed aggregates, fill materials, sand) and their access roads, camps, diversions and detours and the area immediately after the RoW (150 m on both sides). **The temporal boundaries of the project consist of the** durations for mobilization, construction, and demobilization phases of the project which is shown in the table below. It addition, the temporal boundaries are the design periods of the road and its components (road pavement, culverts etc.).

Phase	**Time**
Mobilization period:	4 months
Construction period:	24 months
Demobilization period:	3 months
Design period of the road pavement:	20 years

4.2. Institutional Boundaries: The road project falls under the Ministry of Works, Transport, and Communication. The project is being implemented by TANROADS, which has the primary function of maintaining and developing the road network of Tanzania. When it comes to fulfilment of other legal frameworks, then comes Vice Presidents office with the following institutions: Division of Environment who coordinates environmental management activities like coordination of environmental policy and issuing environmental clearance or ESIA approvals; National Environment Management Council – coordinates Environmental Impact Assessments, Monitoring and Auditing; Dodoma City through which the project road passes there are institutional bodies, which includes the following: District Executive Directors their teams of experts in various fields - engineering, water, health, community development, natural resources, environment, land, property valuation etc.

4.3. The climate of Dodoma is semi-arid, characterized by a marked seasonal rainfall distribution with a long dry and short wet seasons falling through December to April each year. In 2011 the total rainfall was 643.1mm while in 2012 it was 605.1mm. However, the calculated total annual rainfall ranges between 550-600mm per year. The general trend of average temperature varies from 200C in July to 300C in November each year. The highest temperature is 31.40C while the lowest is 14.50C. Due to the semiarid nature of Dodoma City dry wind is a common feature with increasing wind speed in July to November. It can be concluded that wind speed is usually high in dry season compared to wet season.

4.4. Topography: The Dodoma region is characterized by broad upland plains which are part of East African's Central Plateau. The Plains shelve gently down to mbuga swamps and separated by ranges of hills and punctuated by inselbergs, prominent, isolated rock outcrops. The Dodoma hills rise about 400 metres above the general level of plains. They are of great charm, with gentle valleys dividing them, such as Ntyuka and Ruaha valleys. Bounding the northerly plain to the North east are the more mountainous Hombolo Hills, rising 900 meters above the plain. From the site of the capital these appear as a massive wall.

4.5. Geology and Soils: Geology of the area is characterized by intrusive Basement Complex rocks, mainly granites**.** The granites outcrop in scattered inselbergs, mainly in Dodoma Hills south of Dodoma and in the Chenene mountains in the north. The granitic rocks are believed to be of late Precambrian age but their exact age, mode of emplacement and distribution in depth are so far unknown.

4.6. Water Resources and Hydrology: Due to semi-arid nature of Dodoma City, there is no surface water body within or near the proposed Project road. There are small streams which are usually dry throughout the year, except during thunderstorms when they collect most of the runoff from the hills and foot slopes and store this water in the sandy stream beds or drain it into the swamps where it evaporates or feeds groundwater reservoirs.

4.7. Groundwater is abundant in almost all the villages along the project road. This is evidenced by the fact that shallow wells are one of the sources of domestic water supply for all the villages along the project.

4.8. Air Quality: The typical air pollutants from road transportation sources are Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Sulphur Dioxide (SO2) and volatile compounds; and particulate matters (dust). Despite the fact data on pollutant concentration along the proposed site was not available, ambient air quality was observed to be very good due to the following reasons;

- Currently there is no road (except for the 4 junctions) so there is neither dust nor vehicular emissions
- There is no industry nearby as the land is mainly used for settlements and farming
- Settlement areas are open (which facilitates populates dilution/dispersion).

4.9. Noise and Vibrations: Despite the fact that data on noise pollution of the project area was not available during the time of conducting the survey, the fact that there is no road (except for the 4 junctions), the noise and vibrations levels are rated to be negligible as the only source of noise at the project area are motor vehicles using the 4 major roads crossing the project area.

4.10. Vegetation: In their natural state, the plains are marked by open grassland with little or no tree or bush cover. Due to the erratic nature of the rains and strong radiant heat of the sun, much of the grass is sparse, except in the low lying areas. Most common, however, are wooded grassland and bush land with thickets. These types of ground cover represent the majority in Dodoma area. In many areas they are typified by groups of enormous baobab trees. The bush tends to be leafless and drab in the dry season, but springs to luxuriant life during the rains when the whole countryside turns a brilliant green. Woodlands form the remainder of the area, with the heaviest concentrations on the hills of the region.

4.11. Natural vegetation along the project site is almost uniform and it is mainly Acacia Commiphora deciduous bushland. This vegetation type is a representative of Somali-Masai Acacia-Commiphora deciduous bushland found it Tanzania. It is being characterized by an assemblage of small trees and bushes growing on rocky soil with scattered emergent trees of Adansonia digitata (Boabab). Common trees found in this vegetation includes; Commiphora spp, Acacia senegalensis, Euphorbia tirucalli,E. candelabrum, Delonix elata and succulents species of Opuntia vulgaris, Cissus quadrangularis, Adenia volkensii as well as Adenium obesum. Settlements along the project site have alien plants which area characterized by ornamental plants and includes; Bouganvillea, Catharanthus rosea, Cenna siamea and Mangifera indica**.**

4.12. The main fauna of the area for which the project road passes consist of domestic animals such as livestock, dogs, chicken, and birds. No wildlife of any kid was observed.

4.13. According to the 2012 National Housing and Population Census, the population of Dodoma City was 410,956 consisting of 199,487 males and 211,469 females representing (24%) and (1%) of the Dodoma region and National population respectively. Basing on the annual growth rate of 2.4 % of 2012, the population of Dodoma City is exponentially projected at 463,353 in 2017 (five years since 2012 census) and 522,428 in 2022 (ten years after the 2012 census). The population density for the then Dodoma Municipality was 116.6 persons per sq. km in 2002, 148.4 persons per sq.km in 2012 and in 2013 is 151.7 persons per sq.km as obtained from the projected population. In the next census which will be in 2022 the population density is projected to be 202.3 persons per sq.km**.**

4.14. Culture. Dodoma City is one of the districts in Tanzania that is endowed with cultural practices. The major tribes in the City include; Gogo, Rangi, Sandawe, and few of the other tribes. The polygamist, extended families and male dominating decision making are among of the key culture of the areas. The most common languages spoken in the council include Kiswahili, Kigogo, Kisandawe, Kirangi and other minor tribes. The common food stuff for the indigenous people in DMC include Ugali (Stiff porridge) served with dried green vegetables and milk in some families. Mlenda is common for gogo people and Sandawe people and they are normally collected during wet seasons and dried for future use.

4.15. Ethnicity: The main ethnic groups in the project area are Wagogo and Warangi who resided in Hombolo and Kikombo divisions respectively. Other small ethnic groups include the Wahehe, Wanyaturu, Wasandawe and Wasukuma. Most of the ethnic groups are predominantly agriculturalists. Regarding religion, 78% of residences are Christians and 22% are Muslims and the rest never indicated their religion.

4.16. Settlement: The route corridor is densely populated. Settlement patterns include dispersedly (though by no means isolated) dwelling nucleated villages and small urban centres. Most of the settlement reveal the influence of the Government Institution like Makutupora Jkt, Ihumwa Army division, University of Dodoma, in that houses are built in straight lines – though much infilling has since occurred**.** Buildings in the densely populated centres of large wards like Ihumwa, Nala, Makutupora and Matumbulu do face the proposed road, other places the houses are far from the proposed road, and instead there are farms.

4.17. Livelihoods: 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.

4.18. Energy: Some of the households are connected with electricity while others not. Majority 76% of the households are connected with electricity while the rest 20% use solar as a source of light and 4% use kerosene.

4.19. Water Supply: There are different sources of water in the project area. This includes house connection, communal hand pumps as well as natural springs. There are water problems especially in ward like Matumbulu, Nghong'onha and Mbambala wards because of this majority of people don't have a permanent source of water. Villagers travel long distances looking for water. Makutupora, and Zuzu have no water problem compared to other wards.

4.20. Education Services: Education services are well developed. Almost in each ward there is a secondary school. The problem that was observed is the distance of walking to reach those secondary schools. For instance, students within Zuzu, Matumbulu and Nzuguni do walk more than 5 kilometres to reach to a place where the secondary school is located.

4.21. Land use and Ownership Patterns: There are different systems of land tenure found along the project road. This includes; customary right-inherited from parents, village government allocation, buying as well as self-allocation. The primary data from the socio economic survey revealed that 45% of the interviewed households acquired land through buying while 47% inherited land form their parents the rest 5% reported to have been given land by village government. Only 3% of the interviewed households have been allocated land themselves. During the selling of land the village government normally witnesses the transaction and keep records for future reference in case of problem between a seller and a buyer.

4.22. Housing: In the Dodoma Municipal communities, cement bricks are the usual walling materials. Good numbers of houses are roofed with corrugated iron sheets. These houses are normally owned by wealthier members of the community. The proportion of houses built with durable materials is significantly found at all Wards. All houses are either square or rectangular. All houses are single story and have two to three rooms. Houses are almost exclusively owners occupies, there are many houses which are rented by employees and other people working in the wards.

5. SUMMARY OF PUBLIC AND STAKEHOLDER CONSULTATIONS

- The construction of the Poad will open the economically other areas like Bihawana, Matumbulu also Zuzu, which the centres for businesses will grow and also agriculture issues will be improved
- Dodoma City now is finalising its master plan, it will be good if the consultant/TANROADS share the design with the Dodoma City
- The project will help the master plan to attentive, and feasible
- All borrow pits must be rehabilitated well after construction
- There are three satellite towns earmarked at Veyula, Nala and Kikombo (near Ihumwa) therefore the project road shall serve these towns
- All types of wastes must be well collected and taken to the Landfill at Chidaya about 12km from city centre
- Community sensitization programme on HIV matters must be part and parcel of the project

- Community development officers of the municipal must be part of the programme
- Contractors must construct diversions that will allow users to access road service and effectively implement environmental and social management plans
- The compensation aspects need to be addressed effectively and therefore ward/sub ward governments in collaboration with the central government should engage to assist the PAPs in acquiring the land for construction. Many ward/subward governments have enough reserved lands for those who will be landless.

6. ALTERNATIVE ANALYSIS

The following alternatives have been analyzed:

Alternative	Description of Alternative
Base Alternative (Alternative 1)	Without project or Do minimum. The project road retains status quo and gets minimal maintenance.
Alternative 2	Construct a Bypass Ring Road (2-lanes) AC standard
Alternative 3	Construct a Bypass Ring Road (4-lanes) AC standard
Alternative 4	Construct a Southern Bypass Half-Ring Road (2-lanes) AC standard

7. The result of the study concluded that construction of the Dodoma Outer ring road to AC standard is economically viable, with positive NPV and IRR greater than the test discount rate of 12%. Two options (2-lane and 4-lane roads) are both economically viable, but the 2-lane option has higher NPV and IRR values than the 4-lane option. The DBST option is therefore recommended as the most preferred option. On the other hand, the volume/capacity considerations show that the 2-lane option is likely to get traffic jams before its economic life of 20 years while the 4-lane option is not likely to develop traffic jams during its economic life. Based on the economic viability, it is recommended that the government should continue with project preparation and implementation activities.

8. POTENTIAL ENVIRONMENT AND SOCIAL IMPACTS AND MITIGATION MEASURES

8.1. Summary of Impacts

S/N	Environmental parameters/Impacts	Impact Rating Criteria					Impact Significance Rating			
		Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
	Negative Impacts									
1.	Land expropriation, loss of property and resettlement	L	ST	R			-3	-2	0	0
2.	Destruction of public utilities	L	ST	R			-1	-2	0	0
3.	Soil erosion and instability of slopes	L	ST	R	✓		0	-2	-1	0
4.	Increased noise, vibration and air pollution	L	MT	R	✓		-1	-2	-2	-1
5.	Occupational Safety and health risks	L	ST	R			-1	-2	0	+1
6.	Increased accidents	L	MT	R	✓		-1	-2	-1	-2
7.	Increased Waste	L	ST	R			-1	-2	-2	-1
8.	Loss of Scenic Quality	R	LT	IR		✓	-1	-2	-1	-1
9.	Loss of Vegetation	R	LT	R		✓	-1	-2	0	0
10.	Interference to local hydrology	L	LT	R		✓	0	0	0	-2
11.	Loss of Definite Materials and Land Degradation	L	ST	IR		✓	-1	-2	-1	-1
12.	Increased HIV/AIDS	R	LT	IR	✓	✓	-1	-2	0	0
	Positive Impacts									
1	Employment Opportunities	R	LT				+2	+3	+1	+2
2	Improved Transport and economy in Dodoma suburbs	N	LT				0	0	0	+3
3	Decongestion of Dodoma main Roads	R	LT				0	0	0	+3
4	Improved community life and services	R	LT				0	0	0	+3

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

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

8.2. Preconstruction Phase: During this phase people shall be employed by the contractor to do mobilization works such as construction of site offices, quarrying and material extraction and transportation activities etc. About 50 people shall be employed during this phase. This shall increase the income to all those who have the opportunity to be employed by the contractor. Negative impacts include Land expropriation, loss of property and resettlement Loss of employment and income.

8.3. Construction Phase: The following impacts were identified to be likely to occur during construction phase: most of the casual laborers and some skilled workforce will be absorbed from within Dodoma Municipality. The Project is expected to employ more than 100 casual laborers from nearby streets. In addition, the local people will be selling food and other merchandise to the construction workforce. The utilization of local workmanship will take place for the activities that do not require a high specialization, and in any case there will be diffusion of knowhow from the more qualified personnel towards the local personnel. Negative impacts include the following:

- Destruction of public utilities
- Soil erosion and instability of slopes
- Risk Water and Land Pollution
- Increased noise, vibration and air pollution
- Occupational Safety and health risks
- Increase road accidents
- Increased Waste
- Loss of Scenic Quality
- Loss of Vegetation
- Child Labor
- Increased HIV/AIDS Population Influx
- Visual Intrusion during Construction

8.4. Operational Phase: The following impacts were identified to be likely to occur during operational phase;

- Job creation and increased income
- Improved Transport and economy in Dodoma suburbs
- Decongestion of Dodoma main Roads
- Reduced Vehicle operation costs
- Increase road accidents
- Interface with local hydrology

9. MITIGATION MEASURES

9.1. Pre-construction Phase

9.1.1. Land Expropriation, Loss of Property and Resettlement

- The designs shall try as much as possible to avoid peoples properties
- Compensation shall be done according to Tanzania laws governing resettlement before commencement of the construction activities.
- Resettlement Action Plan (RAP) shall be prepared and implemented.

9.2. Mitigation Measures for Construction Phase Impacts

9.2.1. Destruction of Public Utilities

- The TANESCO and UWASA shall be involved from the early stages of these project so as to have an integrated planning.
- Early notice shall be given to the community before any service interruption
- The funds for the relocation of this infrastructure shall be part and parcel of the Project.

9.2.2. Soil Erosion and Instability of Slopes

- Unnecessary ground clearance and sensitive re-alignments shall be avoided.
- Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of storm-water. The discharge points shall be carefully chosen to avoid erosion of arable land and creation of gullies.
- The contractor should plant grass or any other vegetation cover to minimise exposed soil surface.
- Proper grading to promote sheet flow and minimize flow concentration on unconsolidated soil.
- Directing flow to properly designated channels.

9.2.3. Noise, Vibration and Air

- The nuisance of noise, vibration and dust will be transient and good work practice can minimize them. In addition, these impacts are already being experienced due to the existing road segments.
- The impacts of noise will further be minimized by proper choice of plant and machinery (i.e. fitted with noise silencers or reducers) and locating quarry areas away from human habitations (at least 500m away).
- Dust at work places within or close to human habitation should be critically minimized by periodic water sprinkling on working sections. The contractor shall advise or notify local households on dust, noise, vibration and other dangers.
- Watering should be practiced regularly at all active work sections along the road and at all quarries and borrow sites for the protection of workers. In addition, sections of road heavily traversed by construction vehicles should also be regularly watered.

9.2.4. Safety and Health Risks

- Appropriate working gear (such as nose, ear mask and clothing) and good site management shall be provided.
- During construction the contractor shall ensure that the site office is fenced and hygienically kept with adequate provision of facilities including waste disposal receptacles, sewage, firefighting and clean and safe water supply.
- The contractor may be required to drill a borehole for obtaining water for construction.
- A well-stocked First Aid kit (administered by trained first aider) shall be maintained at each site office, quarry sites and each active work section along the road.
- The first aider shall also be responsible for primary treatment of ailments and other minor medical cases as well as providing some health education to the workforce.

9.2.5. Increased Road Accidents

- The road design shall take account of safety concerns especially at human habitation crossings e.g. installation of bus stops at settlement centres.
- Traffic management plan shall be incorporated in the designs to include for example details of signs, markings, intersection layouts, access restrictions, bus stops, crossings, footpaths etc.
- The traffic management plans shall be presented both in English and Swahili.

9.2.6. Increased Waste Generation

- Adequate number of waste bins shall be provided at the construction sites site
- Only inert materials or readily decomposable materials shall be disposed by burial.
- No burning of waste materials which produces black smoke shall be approved. Plastics shall not be burned.
- No open burning of oils shall be done
- The construction sites shall have adequate toilets with septic tank-soak away treatment system.

9.2.7. Loss of Definite Materials and Land Degradation

- The topsoil shall be stock piled for later use in reinstating the pit. Shallow slopes will encourage rapid re-vegetation thus preventing erosion as well as providing safety to animals.
- Obtaining sand from valleys and riversides must be well investigated to avoid accelerated land degradation and pollution of water sources and/or interfere with agricultural activities in farmland.

9.2.8. Loss of Vegetation

- Close supervision of earthworks shall be observed in order to confine land clearance within the proposed new corridor of impact boundaries.
- Topsoil shall be stockpiled and used for reinstating flora along the road. It is assumed that displaced fauna will return once the work is over, or seek another habitat locally.
- The road design shall try as practicable to offset the route so as to avoid felling all big trees that take many years to grow or other flora of outstanding importance.
- Consultation with the Dodoma City Natural Resources Officer shall be made.

9.2.9. Loss of Definite Materials

- Exploitation of construction materials will be from the authorized source only
- The borrow pits/quarries shall be restored after use constituting levelling the area and seeding or planting of trees and/or grasses will done in association with local government (natural resources department). If appropriate the levelled area will be left for natural re-vegetation.
- Shallow slopes will encourage rapid re-vegetation thus preventing erosion as well as providing safety to animals.

- Obtaining sand from valleys and riversides must be well investigated to avoid accelerated land degradation and pollution of water sources and/or interfere with agricultural activities in farmland.
- Construction equipment shall be maintained in good running condition and refuel restriction at the workshop/base camp.

9.2.10. Increased HIV/AIDS and other Sexual Related Diseases

- The contractor shall deploy locally available labor as practically possible
- Maintain good security in the area with signage like "No employment at the moment", to keep away job seeker to avoid unnecessary people in project sites
- A safety, health and environment induction training shall be conducted to all workers, putting more emphasis on HIV/AIDS.
- In order to prevent more HIV/AIDS infection, during the implementation phase, the project shall include information education and communication component (IEC) in its budget. This will help to raise more awareness on HIV/AIDS, and means to suppress its incidence.
- Staff shall be encouraged the use of preventive measures like condoms by availing condom dispensers.

9.3. Mitigation Measures During the Operation Phase

9.3.1. Increased Road Accidents

- Capacity building of district polices (traffic) offices
- Installation of proper road signs and regular inspections for their presence
- Installation of speed control devices like humps
- Installation of pedestrian lanes at human settlement crossings.

9.3.2. Interference with Local Hydrology

- Where possible, the designs shall leave enough unpaved space alongside the road for water to seep into the ground
- The design will provide controlled and effective storm water dispersion by installation of adequate and appropriate drainage structures.

10. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Environmental and Social Management Plan (ESMP) intends to set forth "environmental and social conditions" that the Project proponent shall adhere to. It aims at ensuring effective implementation of the proposed mitigation measures. The following will be responsible for implementing the ESMP:

10.1. TANROADS will be responsible for the overall implementation, administration, and enforcement of the recommendations of the ESIA, including:

- Ensure that the ESMP provisions are included in all tender documents issued for construction work and activities on site and shall monitor/enforce that the Contractors abides by the specifications thereof
- Coordinating the implementation of the ESMP by the contractor Asses the performance of environmental controls and proposed mitigation measures
- Provide NEMC with reports on environmental and social compliance as part of their annual progress reports and annual environmental monitoring reports.

10.2. *The Civil Works Supervising Consultant* will be responsible for overall project management. The Consultant will be responsible for ensuring day to day implementation and compliance with the portions of ESMP. The Engineer will ensure that the Contractors provide appropriate training for their staff on ESMP.

10.3. *The Contractor will ensure the control and limitations* of disturbance to the project site, routes, and its surrounding environment and communities during the construction cycle of the project. Within 60 days upon notification of contract award, the contractor shall prepare and submit site specific Environmental and Social Management Plan (SSESMP) and Health and Safety Plan (SSHSMP). The Plan shall describe measures to be followed to protect the environment, public, local communities, workers, and ecological habitat in proximity to the Project operational areas.

10.4. *National Environment Management Council* (NEMC) is the main responsible agency for foreseeing development projects carried out in the United Republic of Tanzania adequately address environmental and social issues during the lifetime of the program. NEMC shall therefore:

- Periodically carry out or assign an independent evaluator to carry out compliance monitoring in cases when claim has been raise from any member of the community, Community Based Organization, or Non-Governmental Organization on the negative aspects of the project. During monitoring, District Environmental Officer shall accompany NEMC or an independent evaluator.
- Have the power to request for compliance report on ESMP and take necessary measures including fines to enforce compliance of the ESMP It has been estimated that the total cost for implementing mitigation measures (excluding the cost of compensation of affected properties) and monitoring plans is therefore TZS 634,500,800/= (TZS Six hundred million, Five hundred Thousand Six hundred thousand Eight hundred only).

10.5. Monitoring Plan: *Environmental and Social Monitoring Plan is an objective, periodical, reliable, and continuing process of observation and assessment of environmental changes*. It is intended to ensure implementation of mitigation measures is done the way they have been proposed and in accordance with the regulations and standards. It is therefore based on monitoring indicators, which will have to be compared with targets to gauge the effectiveness of the mitigations plans. There will be two basic forms of monitoring as follows:

- Effects monitoring: This will record the consequences of activities on one or more environmental components. This will involve physical measurement of selected parameters or the execution of surveys to establish the nature and extent of induced changes.
- Measurement Based Inspection: This will involve evaluation of trends in the values of environmental and social parameters systematically measured and collected, to ensure that they are within acceptable legal and technical standards. This will involve collection of samples for analysis. In this, water and air samples will be collected and analyzed.

The main tools that will be used for monitoring are checklists, visual examinations, and quantitative measurements of environmental effects monitoring parameters. Written records will be kept detailing the dates that monitoring took place and the findings of the monitoring. To ensure effective implementation of the mitigations measures, the Engineer shall deploy an Environmental and Social Specialist for regular monitoring and reporting of day to day implementation of ESMP by the Contractor. The Environmental and Social Specialist will also

advise the Resident Engineer on measures to take against the Contractor in the event that the Contractor fails to comply with SSHSMP and SSESMP as well as other environmental, social, and health and safety requirements of the Contract.

11. COSTS AND BUDGET

11.1. The options to minimize or prevent the identified adverse social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the ESMP. Many of them are based on good engineering practices. The ESMP describes the implementation schedule of the proposed mitigation measures as well as planning for long-term monitoring activities. It defines roles and responsibility of different actors of the Plan.

11.2. The Approach environmental and social costs amount to TShs 319,000,000 (Excluding the costs that will appear in then (BOQ) and resettlement exercise. The estimated annual costs for carrying out the proposed environmental and social motoring programme amounts to TSH 105,000,000.

11.3. ESMP BUDGET

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Method / Equipment and Other Requirements	Responsibility	Annual costs estimates (Tsh)
Pre-Construction Phase (Baseline)						
Land Expropriation, Loss of Property and Resettlement	Fair compensation is paid to all PAPs before construction start	Continuous	Project area	*Observations, Inquires and Records*	TANROADS/ Contractor	4,000,000
Vegetation	Vegetation growth within the RoW track right of way to ensure consistence with EMP	Once	Along the Road track	*Observations and Measurements*	TANROADS/ Contractor	5,000,000
Water Quality	pH, Conductivity, Total Suspended Solids (TSS) and Total Dissolved Solids (TDS), COD, BOD and oils	Once	Boreholes and shallow wells along the project road	*Water Quality Accredited laboratory*	TANROADS/ Contractor	3,500,000
Air Quality	TSP, PM10, PM2.5, NOx, SO2, CO.	Once	All settlements along the road	*Ambient Air Measuring Equipment*	TANROADS/ Contractor	1,000,000
Noise and Vibration Baseline	Noise and vibration level	Once	All settlements along the road	*Noise Level Measuring Equipment*	TANROADS/ Contractor	2,000,000
Construction Phase						
Vegetation	Vegetation growth within the RoW track right of way to ensure consistence with EMP	Twice a Year	Along the Road track	*Observations and Measurements*	TANROADS/ Contractor	10,000,000
Water Quality	pH, Conductivity, Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) , COD, BOD and oils	Once in Three Months	Boreholes and shallow wells along the project road	*Water Quality Accredited laboratory*	TANROADS/ Contractor	14,000,000
Air Quality	TSP, PM10, PM2.5, NOx, SO2, CO.	Once in Three Months	All settlements along the road	*Ambient Air Measuring Equipment*	TANROADS/ Contractor	4,000,000
Noise and	Noise and vibration levels	Once in Three	All settlements	*Noise and Vibration Level*	TANROADS/	8,000,000

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Method / Equipment and Other Requirements	Responsibility	Annual costs estimates (Tsh)
Vibration		Months	along the road	*Measuring Equipment*	Contractor	
Safety and health risks	Safety training for workers, accident reports, Number and types of accidents, causes, etc.	Once in Three Months	Construction Site	Incidents Log Book	TANROADS/ Contractor	4,000,000
HIV AIDS Incidents	Training programmes, number of incidences, Numbers of condoms distributed, seminars, participants trained, etc.	Once in Three Months	Camp sites and Construction sites	*Health checks, Observations and Records*	TANROADS/ Contractor	12,000,000
Soil Erosion	Soils eroded, Turbidity in storm water, sources and causes, etc.	Once a Month	Steep slopes along the Road and cut sections	*Observation*	TANROADS/ Contractor	6,000,000
Waste Management	Spoils, waste rocks, slag, domestic refuse, metallic scraps, sludge, waste, composition, treatment methods, etc.	Monthly	Camp sites, Construction sites, Quarry sites	*Office Supplies Waste sampling bins/ plastic bags/ boxes Weighing machines*	TANROADS/ Contractor	12,000,000
Operational Phase						
Noise and Vibration	Noise and vibration levels	Once in Three Months	All settlements along the road	*Noise and Vibration Level Measuring Equipment*	TANROADS/ Contractor	8,000,000
Waste Management	Domestic refuse	Once in Three Months	Along the road	*Observation*	TANROADS	8,000,000
Total						105,000,000

Source: Consultant's Evaluation

12. CONCLUSIONS AND RECOMMENDATIONS

The EIA study results show that although there are some limited negative environmental implications of the project, the local roads will have high socio-economic benefits to the people of Dodoma City and Dodoma in totality. The associated negative impacts, to a large extent have been minimized through good engineering design and envisaged construction practices. Specific mitigation measures have been suggested in this report to offset some of the inherent adverse impacts. Implementing these mitigation measures would increase environmental soundness of the project road.

It is, therefore, concluded that, implementation of the proposed project will entail no detrimental impacts provided that the recommended mitigation measures are adequately and timely put in place. The identified adverse impacts shall be managed through the proposed mitigation measures and implementation regime laid down in this EIS. TANROADS is committed in implementing all the recommendations given in the EIS and further carrying out the environmental auditing and monitoring schedules.

13. REFERENCE AND CONTACTS

Environmental and Social Impact Assessment Report for the Proposed Upgrading of Dodoma City Outer Ring Road (110.2Km) to Bitumen Standard**,** Dodoma Region, Tanzania

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