

Ref. No.: RA/FIM/13/15

17th December, 2018

The Country Manager
African Development Bank
Kang'ombe Building
P.O. Box 30732
Capital City
Lilongwe 3



Attention: Engineer Davis Makasa

Dear Sir,

Project: Multinational Nacala Road Corridor Development Project Phase V: Rehabilitation of Nsipe- Liwonde Road

Subject: *Submission of the Resettlement Action Plan (RAP) and updated Environmental and Social Impact Assessment (ESIA).*

We write to submit the Resettlement Action Plan (RAP) and the updated Environmental and Social Impact Assessment Reports for the Nsipe- Liwonde proposed road project for your review and clearance.

We have also attached to the ESIA document a letter from the Director of Environmental Affairs (EAD) confirming the validity of the ESIA License that was issued to the Roads Authority for this road project in 2013.

We will be submitting both the RAP and the ESIA reports together with all the attachments and a response matrix to facilitate your easy review of the reports.

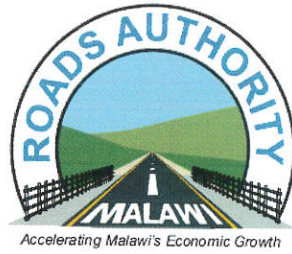
We look forward to your quick review and approval of the reports

Yours faithfully,

pp Eng. Emmanuel Matapa
Chief Executive Officer

Attached/...

JL/jn/ak



PROPOSED REHABILITATION OF LIWONDE-NSIPE (M1/M8) ROAD PROJECT



Environmental and Social Impact Assessment (ESIA) Report

Roads Authority
Private Bag B 346
Lilongwe 3, MALAWI

November, 2018

LIST OF ACRONYMS

AfDB	African Development Bank
AIDS	Acquire Immuno-Deficiency Syndrome
EAD	Environmental Affairs Department
EASS	Environmental Assessment Scoring Scale
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ESIA	Environmental and Social Impact Assessment
HIV	Human Immuno-deficiency Virus
IGA	Income Generating Activities
NSSD	National Strategy for Sustainable Development
NEAP	National Environmental Action Plan
POPs	Persistent Organic Pollutants
RA	Roads Authority
SADC	Southern African Development Community
SEP	Socio-Economic Profile
TA	Traditional Authority
TORs	Terms of Reference

ACKNOWLEDGEMENTS

A number of people provided support to the realization of this study. Of special mention are all stakeholders involved in this project. To the study team, you are acknowledged for your endless efforts. It remains everybody's responsibility to ensure that the environment is managed sustainably.

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EXECUTIVE SUMMARY

Nature of the Project

This document is an Environmental and Social Impact Assessment (ESIA) report for the proposed rehabilitation of the Liwonde-Nsipe Road (M1/M8). The proponent of the project is the Government of Malawi through the Roads Authority (RA).

The developer intends to upgrade the existing road to a 7 meter carriageway and 2 metre sealed shoulders. Both the carriageway and shoulders will be paved. A right of way of 30m will be adopted on either side of the road however 18 meters on each side will be considered in heavily built up areas such as trading centres. The road is approximately 75 km long. Of the 75km, 55km are in Balaka district. Road design and surveys were conducted by Henderson and Partners and are currently being reviewed by Pamodzi Consulting Limited. The total cost of the project is approximately EU 56million and is expected to start in 2018. Currently, the AfDB is appraising the project for a loan agreement.

The rationale for the implementation of this project is specifically based on the following:

- a) In its current state, the road can no longer service the traffic due to its poor condition. The road has no shoulders, and broken edges. In some sections the road has amassed pot holes thereby making it difficult for traffic flow.
- b) The implementation of the project will improve the communication linkages within the country and outside. Many trucks will have a quick cross through of the district as they transport goods and passengers to countries surrounding Malawi and beyond.
- c) The project will have net economic benefits as projected in the economic cost-benefit analysis results with the economic internal rate of return of this project is 12.76%, higher than the social discount rate of 9%.
- d) The project will improve the livelihood of the people in the surrounding area through improvement of service delivery.

In undertaking the ESIA study, the consulting team was guided by the terms of reference provided by EAD. Methodology included use of primary and secondary data sources, and conducting public consultations at professional, administrative and community levels. Data analysis used professional expertise and methodological tools such as the Leopold Matrix. The study also reviewed key policies guiding the implementation of this project include Roads Authority (RA) Vision, Mission and Environmental Policy Statement; National Environmental Policy, 2004; National Land Policy, 2002; National Forestry Policy, 1997; National Water Policy, 2004; National Decentralization Policy, 1998; National HIV/AIDS Policy (2003); Malawi Disaster Risk Management Policy (2015) and National Gender Policy, February 2008. The

legislative framework included Constitution of the Republic of Malawi (1994); The Environment Management Act, 1996; Land Act 2016; Customary Land Act, 2016; Malawi Forestry Act, 1997; National Local Government Act, 1998; Gender Equality Act (2012); Monuments and Relics Act (1990); Physical Planning Act (2016); Occupational Health and Welfare Act, 1997; Water Works Act, 1995 and Public Roads Act (Cap. 69:02) and the African Development Bank policies on resettlement and environment.

Most impacts of the project came from construction activities such as mobilization of workforce; construction of camps; excavation of borrow pits; construction of drainage structures; construction of pavement layers; asphalt surfacing; construction of ancillary works such bus bays, kilometer posts, guardrails, road marking and landscaping. Other impacts emerged from outcomes of social-economic activities stimulated by the road in operational phases. The impacts and their enhancement and mitigation measures were as follows:

Positive Impacts

- **Creation of employment opportunities:** The project will create employment for people in the planning, construction and decommissioning phases. It is expected that the project will create 300 jobs. In order to enhance this impact, the employers should ensure that workers are offered competitive wages in accordance with the country's legislation. The workers should be provided with a health scheme and an exit package.
- **Reduction in travel time:** By removing obstructions on the road such as humps and potholes, travel time will be reduced. This impact will be enhanced by ensuring that the road is of high quality so that it becomes a preferred passage by the travellers.
- **Skills transfer to local community and civil engineering sector:** The interaction between international and local experts will induce information exchange that will result in skill's transfer. This impact will be enhanced by creating a desirable working environment for workers at different cadres.
- **Improved linkage to markets, hospitals and other social amenities:** The upgrading of the road will bring about improved linkage to markets, hospitals and other social amenities by surrounding local communities and people from other areas. This impact can be enhanced by ensuring that adequate road safety facilities are provided on the road. Road safety awareness campaigns should be conducted.
- **Creation of market for goods and services:** The project impact areas will benefit from increased business opportunities because of the construction works throughout the entire length of the road. This impact should be enhanced by ensuring that equal opportunities are offered to business pliers.

Negative Impacts

- **Dust Emissions:** The use of heavy machinery especially on earth works, produce uncontrollable dust. Passing vehicles and the progression of dry season exacerbate the problem. In mitigation, the following measures are recommended: water should be applied at regular intervals in high-traffic and high population density areas; dust masks should be provided for quarry workers, earth plant and machine operators and these workers should be enforced to wear them; and grading works should be undertaken on materials with proper moisture contents.
- **Soil Erosion:** Removal of vegetation cover is a common practice in road construction. This exposes the soil to erosion agents such as wind and run-off. The following should be done mitigate this: minimizing areas of ground clearance; replant vegetation; and avoid ground clearance and excavations during rainy seasons.
- **Land Degradation due to Borrow Pits:** Borrow pits are a safety and health risk to humans and animals if left unattended to. The contractor should consult mandated authorities and the landowners/ neighbours of areas where borrow pits are proposed and their consent obtained prior to creation of the borrow pits; Ensure that borrow pits are opened away from peoples fields and residential areas; the Contractor will provide appropriate drainage at any stage of operations especially when depression which could cause stagnation of water cannot be avoided; and ensure that re-instatement of any borrow pit will take place successively according to the progress of material extraction at the respective site;
- **Impacts from improper disposal of solid waste:** The major impacts from solid waste will arise from improper disposal of rubble and spillages of bitumen and other solvents. A common bad practice in road construction is to dump bitumen or asphalt on the roadside, which represents a traffic hazard, or in gardens, which can impede production or rehabilitation. Mitigation measures include Rubble should be disposed in licensed sites; and cut to spoil materials should be disposed not be less than 5km away.
- **Noise and Vibration:** Noise and vibration impacts will be experienced in settlements and the immediate environment of the road from construction equipment. This could be mitigated by implementing the following measures: limit noise levels to the acceptable ambient noise level of 55dBA between 0600-2200 hours; provide noise barriers around construction materials which produce a lot of noise; noise barriers should be put on both sides of the road in sensitive area such as schools and hospitals; and limit activities that bring vibrations to selected non-pick hours

- **Loss of Vegetation:** In road construction, loss of vegetation will be induced through bush clearing, excavation; and demand for fuelwood at the campsite. To avoid this, the following measures should be applied: Vegetation clearing will be limited in areas where it is necessary; less vegetated areas will be preferred for diversions and additional land; and bare areas will be re-vegetated
- **Pollution of Water Resources:** Water bodies around the project impact area risk being polluted by engine oils and fuel from vehicles and machinery including solid and liquid waste generated from human activities, if not properly disposed of. The developer will ensure minimization of these impacts by: ensuring that the alignment avoids and the earthworks are not done in water catchments, bathing areas and domestic supply water intakes; the road alignment should minimize water crossings; keeping a buffer zone of undisturbed vegetation between the road sites and the water bodies; designing the road drainage system to retain water in small dams (check-dams) or maintain high water tables by raising the inlet to the drainages to the drainage culverts; and providing interceptors in fuel storage areas.
- **Displacement and Resettlement of project affected persons:** The road will follow the alignment of existing secondary roads in the area. However, the road reserves are heavily encroached mostly by gardens. Further to this, creation of diversions in some parts will require temporary acquisition of land. The Public Roads Act does not provide compensations for the encroached road reserve land. Rather, it provides compensations for the investments on the land. However, other road project facilities such as borrow sites and campsites will require land acquisition. To alleviate the impacts of displacement and loss of property, the following measures will be applied: Compensation will be paid in accordance with an approved Resettlement Action Plan (RAP); the road alignment will as much as possible be made to avoid affecting most properties; and maintaining a close liaison between the developer, the contractor and the affected people through the involvement of the District Commissioner's office.
- **Increased prevalence of HIV/AIDS:** The influx of workers and the wages and disposable incomes they will earn will bring potential likelihood of spreading HIV/AIDS and other communicable diseases. The following should be done to mitigate the impacts: carryout a comprehensive campaign to prevent outbreaks of communicable diseases; distribute condoms to the workers; develop and implement a workplace HIV/ AIDS Policy; locate the construction camps away from schools to avoid interaction of school going girls with the workers; and arrange for special HIV/AIDS talk for workers by HIV/AIDS specialist.
- **Human Safety Risks:** The risks are for workers, surrounding communities and road users. Mitigations are as follows: ensure that as much as possible, road alignment should avoid human settlements; contractor should recruit and environmental safety and health personnel to prepare and implement a workplace occupational and safety management plan; Undertake to examine road design standards and

safety equipment specifications to ensure the design details take into account safety concerns and that specific safety features are correctly designed and installed; develop and implement a traffic management plan that includes details on road signs, markings, and intersection layouts, canalization of traffic flows, access restrictions, footpaths, bus stops and provision of non-motorized traffic; and develop road safety measures to teach people traffic safety rules.

- **Encroachment of the road reserve:** This impact is common in post roads construction in Malawi. Recommended mitigations are as follows: Enforce road reserve regulations with all concerned stakeholders; demarcate the road reserve; Lobby with the Councils to enforce the laws regarding vendor location; empower local chiefs and communities in enforcing road reserve regulation; and provide land outside the market for produce market and other commercial ventures
- **Theft and Vandalism of Road Infrastructure:** Laid off workers and surrounding communities may vandalize or steal road signs and other road furniture. The following should be done in order to mitigate the problem: Sensitize the surrounding communities through their local leaders; hire workers locally and provide a good wage; designate a community liaison office to link the activities of the contractor with the aspirations of the communities; and Strengthen community policing in the areas passed by the road.

An Environmental and Social Management Plan has been developed as part of this report and provides enhancement and mitigation measures for the impacts. Institutional responsibilities for co-ordination, planning, administration, management and control of development and environmental issues spread among many agencies, ministries and organizations. The major institutions involved include The Environmental Affairs Department; the Ministry of Water Development and Irrigation; the Ministry of Transport and Public Works; the Roads Authority; the Ministry of Local Government and Rural Development; the District Councils; the Ministry of Agriculture and Food Security; the Department of Physical Planning; and the Department of Climate Change and Meteorology.

The successful implementation and monitoring of the environmental and social management framework would depend on collaboration of different stakeholders at district and national level. At national level, Director of Environmental Affairs will be responsible for monitoring the synchronizations of recommended environmental and social mitigation measures within the sites for public works projects during construction, rehabilitation of existing facilities and during decommissioning phases of the construction and rehabilitation works. Malawi Government will provide financial resources to Environmental Affairs Department (EAD) to supervise the implementation of the ESMP. Environmental Affairs Department will also provide technical support towards Project Implementation Unit to ensure adequate integration of environmental considerations in planning and design. The Department will time to time collaborate with the relevant line Ministry as provided in the ESMP in undertaking such activities.

At District level, members of Environmental District Sub Committee which will consist of at least three technical specialists and led by the Environmental District Officer, will be responsible for carrying out the monitoring the implementation of the ESMP and submit such reports at DEC Meetings. Malawi Government will provide financial resources to all Environmental District Offices to supervise adherence to environmental and social safeguards by contractors during implementation.

CHAPTER ONE: INTRODUCTION

1.1 Nature of the Project

This document is an Environmental and Social Impact Assessment (ESIA) report for the proposed rehabilitation of the Liwonde-Nsipe Road (M3/M8/M1). The proponent of the project is the Government of Malawi through the Roads Authority (RA) whose address is as follows:

Roads Authority
Private Bag B346
Capital City, Lilongwe 3
Tel: (265) 1759468/154 or 01757119
E-mail: nra@nramw.com

The Nsipe-Liwonde Road spans across two districts of Balaka and Ntcheu and the Central and Southern regions of Malawi. The road is approximately 75km long. Of the 75km, 55km are in Balaka district. In terms of classification the Ntcheu Section is part of the M1 and the Balaka Section is M8. The road will follow that existing alignment. The design proposal requires that the road be upgraded to a 7 metre carriageway and 2 metre sealed shoulders at a design speed of 80km per hour and 50 km per hour in extreme cases, dictated by steep topography and in trading centres. Both the carriageway and shoulders will be paved. The design proposed a 200mm base of crushed stone and a 150mm sub base which will largely come from milling and reprocessing existing tar to come up with an upgraded sub base. Surfacing for the Liwonde-Nsipe road will be 9.7m wide and are proposed as a double bituminous surface treatment. A right of way of 30m will be adopted on either side however, 18 meters will be applied on heavily built sections such as trading centres. A contractor is yet to be identified to implement the project. The design and upgrading of the road will cost approximately EU 56million and is expected to start in 2018. Currently, the AfDB is appraising the project for financing requirements.

1.2 Location of the Road

The Nsipe-Liwonde road is located in the districts of Ntcheu on its northern side and Balaka on its southern side in the Central and Southern Regions of Malawi respectively (Figure 1). From Nsipe, the road is connected with the Zalewa Road which leads to Blantyre, the commercial city of Malawi at Chingeni Road Block. The road is also connected by the Liwonde - Mangochi road which is a gateway to the hub of tourism sites along the lakeshore district of Mangochi.

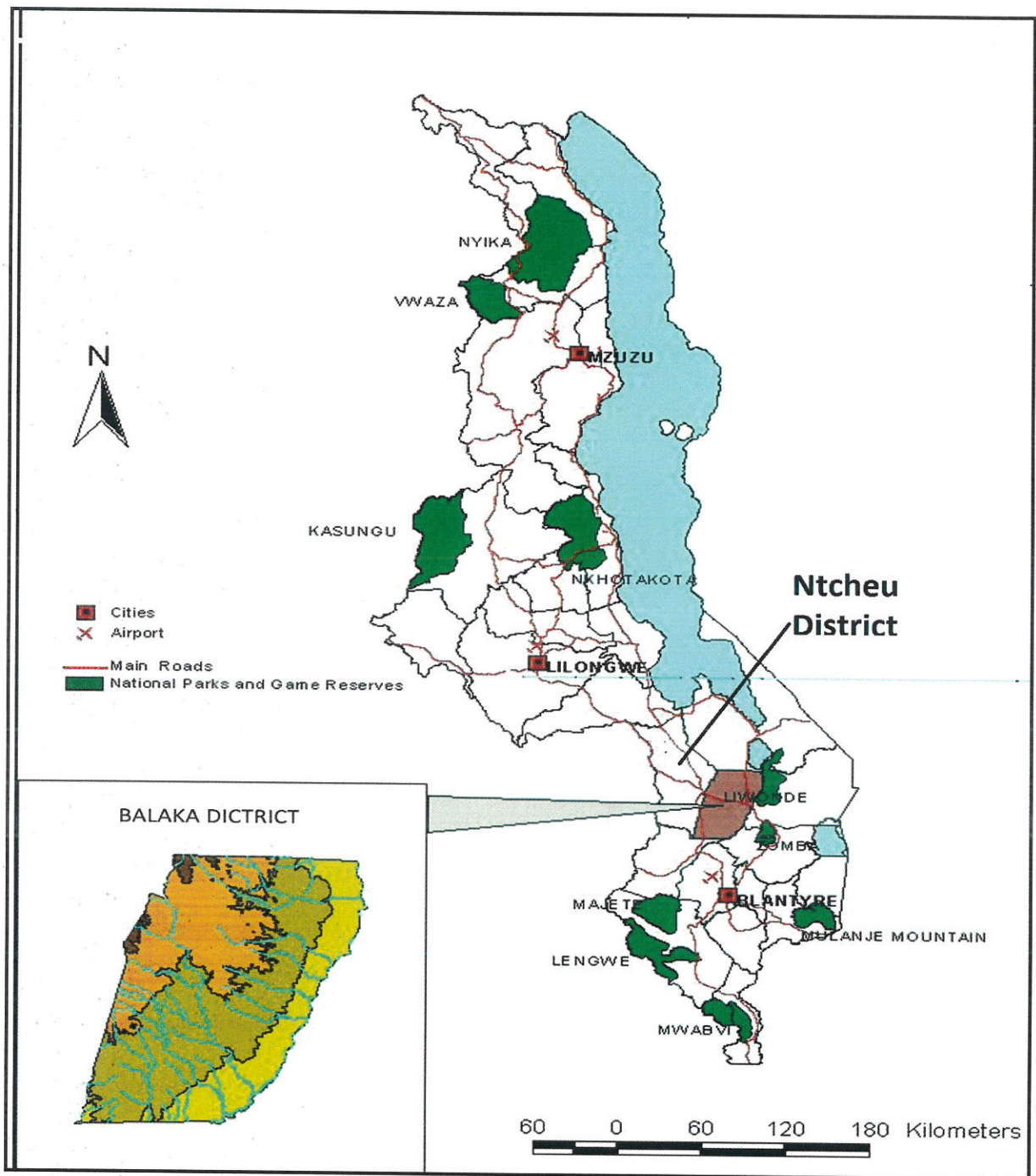
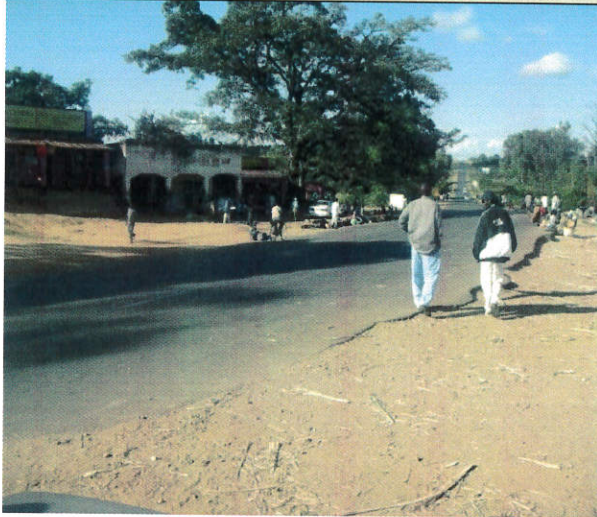



Figure 1.1: Map of Malawi showing the location of Ntcheu and Balaka Districts

The road passes through densely populated areas with most of infrastructures constructed within and closer to the road reserve. Such infrastructure include shops, hawkers, prayer houses and a few dwelling units. These are commonly observed at Nsipe and Balaka Market, Balaka Township, Chiyendausiku and Mangochi Turn-off as illustrated by the Table 1.1 that follows:

Table 1.1: Selected features along the Liwonde-Nsipe Road.

Description	Picture
<ul style="list-style-type: none"> • It is the starting point for the rehabilitation works on the Ntcheu section of the road, 22km from Ntcheu Boma. • It is a vending site for mostly food stuffs. • Most of the shops are not operating. • With rehabilitation works taking place most vendors have to be relocated. • People around the trading center welcomed the project • There is a school behind the trading area. A zebra-crossing could be essential here. 	
	A: Nsipe Trading Center(Ntcheu)
<ul style="list-style-type: none"> • Located some 20km away from Nsipe. • Vending shelters are located within the road reserve. • Four old shops (buildings) constructed in 1960s, located only 5 metres from the road have ever since existed side-by-side with the road. • Vendors claim that they placed shelters close to the road since they were influenced by the positioning of these old buildings. • People at the market generally accept the project but are afraid of being displaced. 	
	B: Balaka Market(Ntcheu)

- It is developing trading center necessitated by the placement of the police road block.
- It has 4 permanent shops, 1 Fuel Station and 2 rest houses.
- Police staff at the road block requested the developer to consider constructing two additional car parks for to facilitate their security road checks.



C: Chingeni Police Road Block(Ntcheu)

- State-of the art church located some 35 m from the road.
- Its is a player house that could serve some of the employees of the contractor.
- Activities undertaken near the church should strictly be done in consultation with the administrators of the church
- The congregation welcome the development and expected that it would complement the beauty of the church


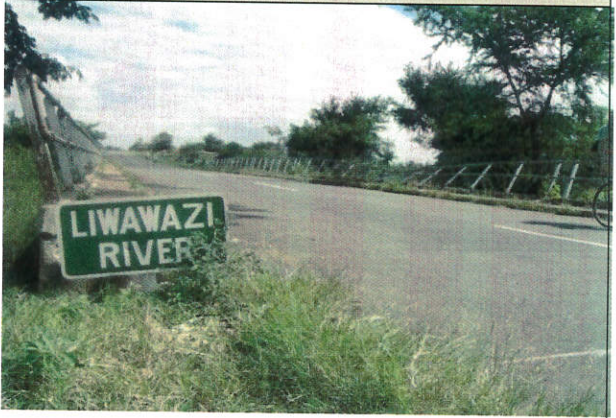



D:St Montfort Catholic Church(Mponda-Balaka)

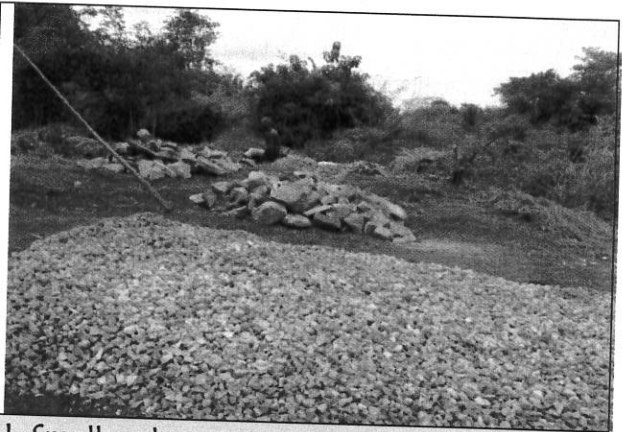
- Located at near a level crossing.
- It is a very busy market with a lot of merchandisers being sold.
- The market is sanctioned by the Balaka Town Assembly and substantial amount of revenue is realised from this market.
- The merchants welcome the project but requested that the contractor liaise with them on how best to execute operations there.



E:Ngawanyemba Market(Balaka)

<ul style="list-style-type: none"> • Located and facing the road at about 25m away from the road. • Students play in front of the school and sometimes cross the road. • There are 6 such schools located along the entire road stretch. • Road safety measures should be considered for this and other similar sites along the road 	
<p>F:ChiyendausikuPrimary School</p>	
<ul style="list-style-type: none"> • Located 17km from Balaka Town. • It is a perennial river that could sustain some of the rehabilitation works • The river has undisturbed bank which are densely vegetated • At some points on the river, sand mining is being undertaken • It is important not to disturb the hydrology of such kind of water sources 	
<p>G:LiwawadziRiver(Chiyendausiku-Balaka)</p>	
<ul style="list-style-type: none"> • Representatives of youth who participated in a Focused Group Discussion at Chiyendausiku. • Their major interest is to get employed in non-skilled works when the project starts. • The accepted the project 	
<p>H:Focused Discussion(Chiyendausiku) Group</p>	

- Small scale quarry stone at Disi Village.
- They intend to form clubs to supply quarry stone for minor rehabilitation works



I : Small scale quarry mining at Disi

- Gardens like these are commonly seen located near the road especially between Balaka and Mangochi Turn-Off
- Approximately 5 hectares of farming land will be affected across the whole road stretch.
-
- Compensations shall be paid where necessary.






J: Gardens within the road reserve

- Charcoal vending is common along this road.
- The lady in pictures says charcoal business is more lucrative than farming
- The project is expected to induce alternative livelihood to the destructive charcoal business



K: Charcoal vending along the road

<ul style="list-style-type: none"> • A mosque in GVH M'manga located 35m from the road. • Works done near this site must be done with full consultation and due respect of the prayer house 	
<p>L:M'manga Mosque</p>	
<ul style="list-style-type: none"> • Located near Mangochi Turn-Off • 15m away from the road • One of the permanent structures closer to the road 	
<p>M: Tourist Resort closer to the road</p>	
<ul style="list-style-type: none"> • These are common along the road and are commonly found within the road reserve. • Traditional leaders indicated that they have advised the owners to refrain from construction inside the road reserve. • The owners indicated that they were doing it at a risk which they are ready to take. 	
<p>N:Common vending unit within the road reserve</p>	

The rehabilitation works for this road will as much as possible avoid huge property loss by reconsidering the magnitude of the right of way at selected densely populated areas like Balaka Market, Balaka Township, Chiyendausiku and Mangochi Turn-off.

1.3 Rationale for the Rehabilitation of the Road

The existing road has outlived its lifespan and is currently in bad state. However, this road is still very crucial in supporting socio-economic development in this region. Approximately 40% of food and material supplies in Zomba come from other districts in the Central Region, passing through this road (Zomba Socio-Economic Profile, 2006). In addition the road is a link to Mangochi through Balaka district. Mangochi is a leading tourism district in Malawi. Balaka is one of the new districts that requires rapid developmental growth. Once this road is rehabilitated there shall be an improved exchange of goods and services among district which will enhance socio-economic growth. In general, even in its current state, the road has been instrumental in facilitating trade, tourism, agriculture, health, education and other sectors of the economy.

The road is part of the Nacala Road Corridor designated as Route 20 on the SADC Regional Trunk Road Network (RTRN) which connects Mozambique at Mandimba/Chiponde border with Zambia at Mchinji/Chipata Border. Rehabilitation of the road will therefore strengthen international trade. Government has observed that the current state of the road is substandard and may not continue to efficiently provide the stated services. The road has developed numerous potholes and cracks in many places making passage of vehicles extremely difficult. The road is also very narrow and inconsistent with standard dimensions of a modern road designed for high volume of traffic. Traffic volume passing through this road has also increased forcing it to take traffic beyond its design capacity.

1.4 Rationale for Undertaking the Environmental and Social Impact Assessment (ESIA)

The requirement for undertaking the Environmental and Social Impact Assessment (ESIA) of this project emanates from the following reasons:

- a) The project falls within the Prescribed and Gazetted list of projects that have a mandatory requirement to undergo an EIA. The Environment Management Act (EMA) of 1996 requires that prescribed projects such as construction of roads undergo an EIA before they are implemented. Based on the afore said, EIA is mandatory for this project. The ESIA will provide the basis for management and monitoring of impacts of the project. The ESIA will also highlight the institutional and legal framework, which the developer has to adhere to ensure smooth implementation of the project. The ESIA will also provide environmental and social baselines, which will be used to measure and determine changes brought about by the project.
- b) The project has the potential to affect other operations being undertaken in the area and beyond. These including other projects like mining, irrigation but also routine domestic activities of the residence of the area. Undertaking the ESIA will propose to the project designers to come up with measures for managing such impacts.

- c) The project will involve extraction of huge volumes of earth materials leading to damaged landscapes. Heavy machinery and equipment shall be used thereby posing occupation safety and health risks. The ESIA provides measures for mitigating risks arising from such operations.
- d) The undertaking of the ESIA is a mandatory project-financing precondition. Project financiers are mindful that developmental projects are meaningless if at the same time they derail the social and environmental fabric, which are crucial elements of sustainable development. The financiers of this project adhere to principles of sustainable development in which conducting of an ESIA is considered as a due diligence-implementing tool.

Therefore, this report constitutes accountability tool on the part of the developer and GoM to ensure that the project construction and operation works are undertaken following principles of sustainable development.

1.5 Methodology for Conducting the ESIA

The Terms of Reference (Annex 1) guided the methodology for conducting the ESIA. The Study Team comprised an environmental expert from Roads Authority, a social expert; road and bridge engineers; resettlement specialist; property valuation experts;. The team also consulted the Roads Authority's Legal Counsel on matters related to policies and laws.

Information for the preparation of this ESIA was collected through primary and secondary sources. Major steps used for this study included: site visits observations; public consultations; property census and valuation; surveys and mapping, structured interviews and public consultations. A desktop review of relevant documents such as the design feasibility study documents and other secondary data sources was conducted. The major methodological steps were as follows:

1.5.1 Literature review

The documents reviewed included Environmental Guidelines for Roads Sector, Forestry Conservation Act, National Environmental Policy, the Environment Management Act, the Water Resources Act and the Land Policy and Act and other pieces of legislation relevant to the activities of the proposed project. In addition, documents relevant to Balaka and Ntcheu Districts Councils such as the socio economic profiles, health surveys and researched data were also reviewed.

1.5.2 Site visits

Site visits were conducted from 12th February to 17th February, 2018. Another site visit was conducted undertaken between 2nd and 7th December , 2018 to address comments provided by the AfDB reviewers of the initial 2013 report.

The first visit objectives were to conduct the environmental and social scoping and conduct a rapid property assessment. The scoping was guided by a structured screening matrix based on a Leopold Matrix for impact assessment. The scoping identified environmental and social settings of the area and predicted the environmental and social issue that would likely be introduced by the project. The administration of the matrix was based on professional judgement and key informant interviews.

On property assessment and valuation, qualified valuers from the Ministry of Lands and valuation were engaged. The valuers conducted an individual assessment of all property within the road reserve. The valuers documented the location of these properties and their description.

1.5.3 Public Consultations

The consultations used a structured questionnaire for those who are plying activities in the road reserve, interviews with technical experts in key stakeholder institutions such as the Ntcheu and Balaka District Councils, Non-Governmental Organisations, Civil Society Organisations, Roads Authority and Ministry of Transport. Community meetings were conducted Traditional Authority Makwangwala in Ntcheu district and Traditional Authority Msamala and Mponda in Balaka District. The meeting were conducted with subjects in villages of Group Village Headmen Gwaza, Kuyenda and Bula in Ntcheu and Ntalika, Mpulula and Sosola in Balaka district Focus Group Discussions (FDGs) were held with women representatives from villages in all Project impact areas located along the road project corridor(Figure 2).





GVH Gwaza(Ntcheu)



GVH Kuyenda (Ntcheu)



FDH with the elderly at Njereza(Ntcheu)



Bawi(Ntcheu)





GVH Sosola(Balaka)	GVH Mtalika(Balaka)
	
GVH Mpulula (Balaka)	Charcoal vending (Balaka)

Figure 2: Public Consultations

The aims of public consultations were to:

- a) Disseminate concepts of the proposed project activities with a view to provoking project interest amongst the communities;
- b) Promote sense of ownership for the project and resettlement activities;
- c) Determine communities' willingness to contribute in kind towards the implementation of the project and;
- d) Determine community willingness to contribute towards long term maintenance of Project facilities; and
- e) To determine some of the expected impacts of the project.

The discussions mainly centered on:

- a) Road and its surroundings (land-use, natural resources, water, etc.);
- b) Impacts of the project on most important features (market places, gathering sites, schools, clinics, quarries, borrow pits, access and feeder roads, etc.);
- c) Sensitive areas (protected areas, graveyards, historical sites, etc.);
- d) Socio-economic and environmental issues to arise from implementation of the proposed project activities;
- e) Gender and HIV/AIDS issues;
- f) Resettlement and compensation of the PAPs;
- g) Where should construction materials be taken from/or not taken from;
- h) Employment opportunities;
- i) Road accidents and existence of black spots along the road;
- j) Benefits (increased trade and transport) and inconveniences due to increased traffic; and
- k) Positive or negative experiences with other contractors elsewhere.

2.1 Project Status

The project is still at design stage. The design team is also expected to take note of the important environmental considerations and preferred mitigation measures at an early stage so that these can be incorporated into design as it proceeds.

2.2 Primary Design Standards of the Road

The carriageway width for the road will be 6.7m with 1.5m wide shoulders. Both the carriageway and shoulders will be paved and have a cross fall of 2.5%. Side drain dimensions will vary accordingly to hydraulic, topographical and maintenance considerations but they will generally be 2m wide and will be paved or lined in masonry where steep longitudinal gradients combine with erodible subgrade materials. Check dams will be constructed in steep slope side drains sections to reduce velocity of runoff.

The design proposed a 200mm base of crushed stone and a 150mm sub base which will largely come from milling and reprocessing existing tar to come up with an upgraded sub base. Surfacing for the road will be 9.7m wide and are proposed as a double bituminous surface treatment. Laboratory test results indicate that materials from selected borrow pit qualify as selected fill materials for road construction without treatment to improve the engineering properties. Gravel is expected to be extracted from borrow pits located in Miliyoni village in Balaka District and Golomoti in the Bwanje part of Ntcheu.

2.3 Facilities, Equipment and Installations

The contractor will use various machines and equipment which are expected to be stored in campsites and roadsides. There will be no major installations except for water and electricity in campsites and signposts along the new road. Since this is a public project, there will be no offsite investments involved.

2.4 Construction and General Operations

Standard precautions for safety procedures shall be taken into consideration. The prevention of oil and other toxic spillages and contingency plans for containing and treating accidental spillages will be adhered to. Stockpiles and excavations will be sprinkled with water to reduce dust generation especially on windy days. Sediment and other pollutant traps will be located at drainage exists from the workings.

2.4.1 Reinstatement

Once extraction is completed from borrow pit areas, they shall be backfilled where possible to return the ground surface to its original landform. Where this is not going to be possible they shall be drained. The backfill shall be free of foreign materials that could break down and pollute groundwater and soil chemistry. This entails that toxic materials shall be removed and disposed of safely. Backfill shall be adequately compacted to prevent erosion of surface materials and to avoid settlement and creation of depressions in which water could collect.

Replanting schemes will be designed to prevent erosion on the reinstated surface and create a vegetation cover comprising indigenous grasses, shrubs and trees. Seedlings may be propagated in nurseries throughout the area, making use of the expertise of the forestry extensions officers as well as extensive community participation. Seedling nurseries will be established in the season before planting is expected to commence.

2.4.2 Ensuring Professional Hydrologic and Engineering Studies

Professional hydrologic and engineering studies have been done and incorporated all findings in the design of drainage structures and systems including specifications for road design and maintenance that keep water off road surfaces such as turnout drains. This will help to avoid potentially adverse impacts on soils; to minimize possible effects on surface water resources; to ensure correct design of drainage structures and systems; and to reduce the potential for damage from unusually heavy rains and floods.

2.4.3 Culverts and Box Culverts

A culvert will have brick masonry both at the inlet and outlet to keep water from scouring away supporting material. The culverts are of varying widths ranging from 900mm to 3000mm based on the size of the drainage area to enable them handle large flows of water. The culverts will be located in such a manner as to reproduce the natural drainage pattern as much as possible. This will serve to minimise disturbance to the existing soil water regime. The culverts which are located in areas where soils below the culvert outlet are erosion susceptible, the construction of drop inlets to reduce slope and hence scouring velocity will be considered.

2.4.4 Drainage and Turn-out Construction

The road will be constructed with appropriate drainage systems to avoid water retention on the road surfaces and sides. The drainage will be 3m wide ditch drains to allow a large flow of water. The slope of the embankment of the drains is going to be in 1:2 to make the slope gradual to minimise erosion. The wider the side drains invert the lower will be the flow velocities and likewise the potential for erosion. With the improvements in drainage efficiency following the construction of a paved road surface, particular attention will have to be paid to the prevention of erosion in side drains, below side drain turnouts and culverts outlets.

Check dams will be constructed in steep slope side drains sections to reduce velocity of runoff water and minimize soil erosion. These will act as sediment control structures to trap suspended sediment transported by runoff. Runoff shall be frequently diverted into culverts to avoid erosion.

Where the side drains cannot discharge into culverted gullies, these ditch drains shall discharge water into vegetated areas through the use of turn outs. The embankment of the ditches shall be planted with vegetation to stabilize its soils and protect it against erosion. However, this can lead to significant reductions in hydraulic efficiency, if they are not regularly cut back. The spacing of turnouts will depend on the hydraulic capacity of the side drain, its gradient and the prone to erosion of the materials forming its boundary. In practice, the details of topography adjacent to the road will determine the final spacing and location of turnouts. Turnouts are will be designed in such ways that are of such a length that run out to zero depth.

2.4.5 Construction Camps and Plant/Storage Depots

Camps and depots will be located away from settled areas and on land of low community value. These have been proposed at Kapalamula, Chiyendausiku and M'manga. A reliable water supply will be required and it is important that this does not interfere with existing community water supplies. Retention bunds shall be constructed around fuel and oil storage areas and all drainages and effluent shall be treated before being discharged into the drainage system.

2.5 Water Abstraction

The Contractor might consider drawing water from Nsipe, Rivirivi and Shire rivers. Liwawadzi and Chimwalire have very low volumes that might affect the downstream users. The abstraction of water for construction purposes will have to be given serious considerations to the requirements for local potable water supplies and take into consideration the riparian rights of the people downstream.

2.6 Project Personnel and Working Conditions

The Project will benefit both indigenous workers and migrant workers. It is expected that the project will employ more than 300 people including professional, skilled, semiskilled and unskilled staff. Staff may be changed with time and place of operation.

2.7 Project Activities

The project will involve the following activities: -

- Detailed engineering designs and feasibility studies

- Clearing of vegetation along new horizontal alignment and existing road sides to widen the road
- Cut and fill to change vertical road alignment, remove top layer and to facilitate the construction of road related infrastructure including bridges and culverts
- Excavation of gravel sub layers and other fill materials
- Construction of campsites involving construction of temporary shelters, installation of water and electricity, paving or levelling to accommodate equipment and stores
- Blasting and mining of quarry.
- Construction of temporary reservoirs for water abstraction
- Application or drainage of excess water
- Transportation of soil and construction materials
- Construction of road related infrastructure including bridges, culverts, parking spaces, signs, and other drainage systems
- Application and compaction of base layer and sub base natural laterite gravel Road paving and sealing
- Installation of road signage
- Construction of road shoulders and road drainage systems
- Landscaping and rehabilitation of degraded sites including borrow pits and detours
- Re-vegetation cleared soil surfaces
- Decommissioning of project

2.8 Schedule of Works

The work is scheduled to be completed in four phases comprising detailed road designs, rehabilitation, decommissioning of civil works and operation and maintenance of the new road. During the detailed designs a number of studies will be carried out including the geo-technical surveys and this ESIA to inform the design process. The constructional phase is expected to take a maximum of two years.

2.9 Land Use and Tenure Systems

In Malawi, the management of customary land is delegated to Traditional Authorities (TAs) by the President. On the other hand, public land is managed by Government through the Department of Lands while as private land is that which is leased by individual persons or institutions (Land Act, 1969). The road largely passes through customary land in TAs Makwangwala (on Ntcheu Section) and Nsamala (on Balaka Section). At Balaka Town and Mangochi Turn-of Town, the land is owned by the Assembly or private institutions and individuals. This implies that any compensation of property or land will be accrued to individuals or institutions (private or public) depending on the management authority of the affected land category. However, the general procedure is that public projects will be compensated by the Office of the President and Cabinet through the Department of Lands and the project proponent in this case Roads Authority. Approximately 90% of the customary land in the two districts is used for agriculture. The rest is occupied by settlements, rivers and forests. The

works intend to minimise property loss by sticking to the existing and available right of way in densely populated areas.

2.10 Availability of Materials and Production Methods

Materials required for the project include gravel, sand, water, cement, quarry stone aggregates, paints, bitumen, solvents, bricks, wood, electronic gadgets, explosives, wire and ropes, steel-enforcements, plastics, diesel, petrol, oils, food items, various mechanical equipment, labour, management, vehicles, biological materials, propellants, various laboratory chemicals, gases, electrical energy, soldering equipment and other minor inputs. Most of these materials are locally available. Some of these materials will have to be procured from different sources locally or imported.

2.11 Anticipated Products and By-products of the Project

The main product of this project is a modern fully engineered bitumised road that has the capacity to withstand the effect of harsh weather and heavy traffic. It is, however, likely that the project will also produce unwanted results and by-products. These by-products may include pollutants such as oils (petrol and diesel) and toxic fumes (CO, CO₂, NO_x, SO_x, aromatic compounds, particulate matter and other volatile compounds) from hot asphalt and engines, dust, noise, silt, vibrations, strong lights, smells and others.

This project is likely to maintain the existing road alignment except in a few circumstances where the road requires straightening or bypassing certain features. This means that displacement and loss of property will be kept to a minimum. However, field visits and public consultations show that in certain places few people that have moved into the road reserve will have to be displaced and relocated to other areas.

CHAPTER THREE: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

This chapter outlines the policies, legislative and administrative framework to guide the implementation of the project.

3.1 International Policy Framework

Malawi is a signatory to a number of international conventions on environment. These include: Convention on Fishing and Conservation of Fishing Resources; African Convention on Conservation of Nature and Natural Resources; Convention on Biological Diversity; International Plant Protection; Convention on Fishing and Conservation of the Fishing resources of the High Seas; Convention on International Trade in Endangered Species (CITES); Convention on Wetlands of International Importance (RAMSAR); UNESCO World Heritage Sites Convention; Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention); UN Convention to Combat Désertification ; Kyoto Protocol; and Vienna Convention & Montreal Protocol (Ozone Layer). After analyzing the environmental and social settings in the project area, the provisions two main international conventions require some consideration when implementing the project as follows:

3.1.1 Convention on Biological Diversity

The primary goal is the maintenance of biological resources to meet the needs and aspirations of both present and future generations. The convention recognizes that biodiversity has an intrinsic value and is vital for agricultural, medicinal, scientific, research, tourism and other socio-economic developments. The conservation of biodiversity both within and outside protected areas including mountains is best done following the ecosystems approach and ex situ conservation is only important to support conservation of rare and threatened species.

Malawi entered in 1992 and ratified the convention in 1994. Under this convention, Malawi has committed to provide an enabling environment to reduce the current rate of biodiversity decline. Road construction activities result into loss of habitats, which are essential in maintenance of the biodiversity. This is experienced through interference of habitats during bush clearing, excavation as well as pollution of aquatic habitats due to fuel leakages. There are no specifically protected habitat area along the proposed road corridors, however the clearing of the road reserve will encroach into natural forest covered areas.

3.1.2 United Nations Convention Framework on Climate Change

The convention aims at stabilizing greenhouse gases concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate

system. The framework sets non-binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms.

The parties to the convention have established legally binding obligations for developed countries to reduce their greenhouse gas emissions. Malawi ratified the Convention on 21st April 1994. This showed the country's total commitment to addressing climate change issues nationally and globally.

Malawi is a net emitter of carbon dioxide. This means that Malawi emits more into the atmosphere than it is able to absorb. Land use, Land use change and forestry (LULUCF) contributes the largest percentage of the emissions due to our cultivation practices. Malawi's Greenhouse gas emissions are insignificant at the global level. This notwithstanding, Malawi is committed to the development and implementation of Nationally Appropriate Mitigation Actions (NAMAs) that are meant to contribute to reduction of emission of greenhouse gases. One of the strategies is to promote afforestation, which in turn will provide carbon sequestration mechanisms. This project will involve clearing of almost 16 hectares of vegetation. This activity counteracts the strategies on carbon sequestration in attaining the objectives of the convention'

3.2 National Policy Framework

3.2.1 Roads Authority (RA) Vision, Mission and Environmental Policy Statement

The Statement provides policy direction and guidance for all road activities including construction. The project will be implemented in compliance with this policy. The RA policy statements state that by the year 2020, the Malawi public road network shall be developed and maintained up to a standard where all motorized and non-motorized traffic reach every society in the country in adequate, safe, reliable, efficient, economic and in an environmental friendly manner at all times of the year. The principles underlining the policy are as follows:

- Comply with the relevant health, safety legislation in accordance with Section 13(d) of the Malawi Constitution and adherence to the environmental best practices for the roads sector;
- Prevent adverse environmental effects of road construction and ensuring that the infrastructure itself is environmental friendly;
- Enforce environmental management practices in line with international standards ISO 14,000 series;
- Carry out on-site supervision on sites with consultants and contractors to ensure environmental due diligence;

3.2.2 National Environmental Policy, 2004

The overall goal of the policy is to promote sustainable social and economic development through the sound management of the environment and natural

resources. The specific policy goals address issues of environmental security for health and wellbeing of people, sustainable utilization and management of the country's natural resources, long-term self-sufficiency in food and energy, ecosystem integrity and sustainable environment and natural resources management. The policy promotes the rights of every person to a clean environment while also at the same time stating that every person has a duty to promote sustainable utilization and management of the environment and natural resources, including taking legal action against any person whose activities or omissions have or are likely to have adverse effects on the environment. The project will integrate the principles of the environmental policy into the project so that rehabilitation is done in an environmentally responsible manner with the participation of all stakeholders.

3.2.3 National Land Policy, 2002

The National Land Policy of 2002 provides an institutional framework for democratizing land management and outlines procedures for protecting land tenure rights, land-based investments and management of development at all levels. It basically seeks to optimize utilization of Malawi's land resources for development.

The objectives of the policy include promotion of tenure reforms that guarantee security and instill confidence and fairness in land transactions. Chapter 9 of the policy deals with the protection of the environment and land resources. This policy will guide in making important decisions concerning compensations of the people who have settled within the road reserve as well as land taken by diversions and other activities related to the project. As the propose route stands, there are dense settlements especially where the road passes Balaka Township and Chendausiku.

3.2.4 National Forestry Policy, 1997

This policy aims at promoting sustainable contribution of forests, woodlands and trees towards the improvement of the quality of life in the country by conserving the resources for the benefit of the nation and to the satisfaction of diverse and changing needs of Malawi population, particularly rural smallholders. The policy prevents unnecessary changes in land-use that promote deforestation, or endanger the protection of forests which have cultural, biodiversity or water catchment values. It also discourages establishment of any development activities in gazette forests unless proven to be environmentally friendly for which suitable intersect oral and local consultations will be conducted. Above all, the policy advocates the carrying out of environment impact assessment where actions are likely to have significant adverse impacts on important forests and other resources. The planners and contractors for the project will take full advantage of provisions under this legislation to minimize destruction of forests and related resources.

3.3.2 Environment Management Act, 1996

The Environment Management Act, enacted in 1996, provides the legal basis for the protection and management of the environment and the conservation and sustainable utilization of the natural resources. Section 24 of the Act outlines the ESIA processes to be followed in Malawi and requires that all project developers in both the public and private sectors comply with the process. The “*Prescribed List for which ESIA is Mandatory*” that is gazetted under section 24 of the Act, sets out which activities must have an ESIA before they can be implemented. Activities associated with road works – quarrying and mining for aggregate material, for example, are also prescribed activities. Furthermore, projects that have the potential to affect national parks, water resources, cemeteries and historical sites (among other screening criteria) also require ESIA. The Act under section 26 (3) further requires that no licensing authority issues any license for a project for which an ESIA is required unless the Director of Environmental Affairs (DEA) has given consent to proceed due to completion and approval of a satisfactory ESIA report or due to non- requirement of an ESIA. This project will adhere to these provisions

3.3.3 Land Act 2016

It recognizes that every person has a natural dependence on land and that it is therefore important. Since the road largely passes through public and private land, the law has implications on the proposed project in that all land for the project should be acquired following formal land acquisition procedures and that the people who will lose property or will be displaced should be compensated.

3.3.4 Customary Land Act, 2016

This law repeals the customary Land Development Act of 1967 (cap 59:01) and provides for the management and regulation of customary law. The main issue under the law is the formalization of powers of traditional leaders on land allocation through land allocation. The law also established customary estates which makes all land parcels held by individual to be private land thereby safeguarding land tenure security of the individual family owners. The implementers project will need to abide by the new law in accessing and seeking to acquire land for the road expansion.

3.3.5 Land Acquisition Act, 1971

The Lands Acquisition Act (Cap 58:04) and the Public Roads Act (Cap 69:02) sets out in detail, the procedures for acquisition of customary land and freehold land. The processes and procedures for proclamation of the land to be acquired in this project

should follow the steps as provided for in the existing Lands Acquisition Act (Chapter 58:04) Sections 3-11. Land for this project will be acquired from individuals and organizations. The procedures set out in the Act are followed to ensure that the private landowners are fairly and equitably compensated. The developer will confine the construction works to the existing road structure and within the road reserve area that is 30 m from the centre of the road to either side of the road to minimize impacts in the immediate environment and properties

3.3.6 Malawi Forestry Act, 1997

The Forestry Act, 1997 provides for participatory forestry, forest management, research, education, forest industries and protection and rehabilitation of environmentally fragile areas. The act among other issues seeks to protect trees and other resources in forest reserves, conserve and enhance biodiversity, protect and facilitate management of trees on customary land, promote community involvement in the conservation of trees, promote sustainable utilization of timber and other forest produce and protect fragile areas such as river banks and water catchment. The road construction project will have to undertake measures to protect trees within the road alignment and limit the cutting down of trees to where it is absolutely necessary in consultation with relevant authorities and communities.

3.3.7 National Local Government Act, 1998

The act mandates local governments to regulate planning and development within their jurisdiction and also empowers them to have by-laws that specify among other issues, how development projects should minimize or avoid environmental degradation. The implementer's road project will have to fulfill the planning requirements of Ntcheu and Balaka District Councils.

3.3.8 Gender Equality Act (2013)

The act addresses critical factors behind inequalities and human rights violations by focusing on: Balancing reproductive and productive roles to enhance women's participation in decision making; Promoting legal and policy reforms and gender-sensitive data collection; Addressing gender-based violence, including traditional practices that harm women, such as child marriage; • Raising awareness of women's strengths, vulnerabilities and needs in various settings including humanitarian situations; and Involving men and boys in promoting gender equality and improving reproductive health. The developer will adhere to these provisions in their operations.

The act requires quotas in the employment sector. This means that an appointing or recruiting authority shall appoint or recruit no less than 40 percent and no more than 60 percent of either sex in any department in any place of employment. This is with particular regard to the public service. Though this is perceived as not applicable to the private sector in terms benchmarks, the directions are that employment opportunities

should be offered equitable and that there will not be any form of discrimination based on sex in workplaces as provided in Section 2 of this Act. The developer will as much as possible and where applicable adhere to the provisions of this act.

3.3.8 Monuments and Relics Act (1990)

The Act governs the management and administration of monuments and heritage sites in Malawi. Among other things, the provisions of the Act restrict unregulated development in protected areas. The contractor will report to the Department of Antiquities on the discovery of objects of historic importance. The same department should be consulted prior to commencing excavation activities so as to seek guidance on the possibility of unearthing objects of that nature.

3.3.9 Physical Planning Act (2016)

The Act repeals the Town and country Planning Act of 1988 (Cap 23.01). The Act seeks to regulate land use, land use planning and the developments of physical projects in Malawi. The act seeks to promote orderly spatial physical development in order to optimize use of and service infrastructure, protect, and conserve fragile ecosystems in space. This is achieved by guiding physical developments through provision of planning permission following appropriate scrutiny by local planning committees or the Commissioner for Physical Planning. The Act regulates development by prescribing screening for environmental and socio-economic implications for large-scale development projects before planning permission is granted. In view of the above requirements, the proposed project is a large-scale development and will have to undergo screening before permission is granted. The current ESIA for the project is part of screening and development control.

3.3.10 Occupational Health and Welfare Act, 1997

The Act regulates the requirements for adequate environmental health and safety measures within workplaces. This Act applies to this project because of its risky nature. Employees are prone to accidents and chemical and biological hazards including disease epidemics. Special precautions such as provision of protective wear will therefore be taken by the contractor to have a safety policy and provide meaningful occupational health safety to all employees and the public.

3.3.11 Public Roads Act (Cap. 69:02)

This Act provides for road standards, safety and classification. The proposed road will fully comply with the provisions of the Act by ensuring that appropriate infrastructure for public safety and road durability are considered. Such infrastructure includes road signage, packing bays, bridges, road markings, road shoulders, drainage systems, road crossings and junctions, road reserves, vertical and horizontal alignments and others.

The public roads act covers the management of road reserves and streets. Land acquisition and resettlement issues are outlined in part II of the act. Section 44 provides assessment of compensations which can be paid under this act. The compensations cover surface and land rights of the owner or occupier of land. Section 45 provides for compensation for conversion of land into public use and the section states specifically that in case of customary land compensation is in respect to disturbance to people, section 49 and section 50 provide opportunities for land owners or occupiers to appeal to the High Court on grievances related to resettlement and compensations provided for in this act.

3.4 Institutional Framework

Institutional responsibilities for the co-ordination, planning, administration, management and control of development and environmental issues are fragmented among a number of agencies, ministries and organizations. The major institutions involved include, Environmental Affairs Department; Ministry of Water Development and Irrigation ;Ministry of Transport and Public Works; Roads Authority; Ministry of Local Government and Rural Development; Ministry of Finance; Ministry of Agriculture and Food Security; Department of Physical Planning; and Department of Climate Change and Meteorology.

3.5 Administrative Framework of the EIA Process

Environmental Affairs Department (EAD) is the authority charged with administering the EIA process and works with other institutions in the process. The Environment Management Act (1996), sets out the powers, functions and duties of the Director of Environmental Affairs in administering the EIA process. The Act under section 10 provides for the establishment of the National Council for the Environment (NCE) and the establishment of the Technical Committee on the Environment (TCE) under section 16. The NCE is a policy making body which advises EAD and the Government in general, on environmental matters while the TCE provides technical advice on environmental matters. Through the TCE, member agencies are informed of projects being appraised, review projects, participate in formulating EIA terms of reference, develop project approval terms and conditions and recommend course of action to the Director. The NCE provides policy guidance to EAD and based on recommendations from TCE will make recommendations to the Minister responsible for environmental affairs on approval or non-approval of EIAs.

As provided for in section 26 of the EMA, a prescribed project cannot receive the required authorization to proceed from the relevant licensing authority unless and until the Director of Environmental Affairs (DEA) issues a certificate stating that an EIA is not required or on the basis of an EIA report that he has approved the project. Under the EMA, the DEA is empowered to require changes to a project to reduce its environmental impact and to reject a project if, in his view, it will cause significant and irreparable damage to the environment.

3.6 Summary of the licenses that need to be obtained for this project

mitigate and compensate for adverse impacts on the environment and on affected communities. The safeguard encourages for stakeholders' participation during the consultation process that affected communities and stakeholders have timely access to information in suitable forms about Bank operations, and are consulted meaningfully about issues that may affect them.

3.8 AfDB Resettlement Policy

The involuntary resettlement policy has been developed to cover involuntary displacement and resettlement of people caused by a Bank financed project and it applies when a project results in *significant* relocation or loss of shelter by the persons residing in the project area, assets being lost or livelihoods being affected. The borrowing agency (Malawi Government) has the primary responsibility for planning, implementing and monitoring resettlement issues.

According to this policy, the borrower should develop a resettlement plan where physical displacement and loss of other economic assets are unavoidable but where feasible, to avoid involuntary resettlement or minimize resettlement impacts where population displacement is unavoidable, exploring all viable project designs. The borrower will be required to prepare full resettlement plan (FRP) for any project that involve a significant number of people who would need to be displaced with a loss of assets, or access to assets or reduction in their livelihood. Significant is defined as meaning 200 or more persons will experience resettlement effects. In addition to this numerical guidance, project planners and the Bank should also determine the "significance" of a project by evaluating the severity of adverse impacts on disadvantaged groups. Any project that has adverse impacts on disadvantaged groups or ethnic, religious and linguistic minorities, or which affects the poorest and most marginalized communities who do not have the capacity to absorb such impacts, should be considered significant, requiring a full resettlement plan.

The rehabilitation of the Liwonde-Nsipe Road does not significantly displace persons due to the engineering design principles adopted in this project including maintenance of the existing road alignment and reduction of the road reserve as it approaches urban areas.

3.9 Gap Analysis between national legislation and AfDB Resettlement Policy

The AfDBs Policy on Involuntary Resettlement and national legislation and policies of the GoM have a number of common aspects in the management of resettlement. Firstly, both emphasise minimising the extent of resettlement. Secondly, both require fair and adequate compensation be paid to PAPs. However, there some gaps which exists between the policies of AfDB and those of the GoM:

Entitlement to compensation : Under the AfDBs Policy on Involuntary Resettlement, displaced persons are classified into the three groups:

of proper industrial waste disposal sites have led to the deterioration of the quality of water resources, through direct or indirect pollution. Road construction results in changes to hydrological patterns if not carefully planned. Road works loosen soils and may encourage heavy siltation.

4.1.3 Soil

Malawi's soils are predominated by three major soil types: the Eutric leptisols, the Chromic levisols and the Haplic lixisols of variable morphology with localised areas of Acrisols, Cambisols, Gleysols, Phaezems, Planosols and Vertisols. The road passes in areas of medium textured sandy soils, sandy loam to clay sandy soils with medium textures, heavy textured sandy medium and shallow stone soils there by making the soils prone to erosion and fertility loss. Being predominantly an agro-driven economy, the soil types will determine the types of crops grown in the area and consequently become the indicators of the socio-economic status of the people in that area.

The districts have different types of soils. The soils include alluvial soils often calcimorphic, lithosols, mopanosols, gleys and ferruginous soils. There are medium-textured sandy soils along the Shire River, sandy loam to clay sandy soils with medium textures in the upper Balaka plain, and heavy-textured sandy medium and shallow stone soils in part of the upper Ulongwe and Bazale. Phalula is characterised by gravel and loams soils while Utale has generally sandy loams, clay sands, and sandy soils with medium texture. The types, fertility levels, and characteristics of the soils determine land use and classification and these are discussed in respective chapters.

4.1.4 Climate

The areas in which the road passes experience a Tropical Climate with three main seasons – cold-dry, hot-dry and hot-wet, ranging respectively from April to July, August to October and November to March. The hottest months are September, October and November, with temperatures ranging from 28 to 30 degrees Celsius. June and July are the coldest months, with temperatures as low as 10 to 12 degrees Celsius. Temperatures on the Ntcheu part of the road average 28 degrees Celsius annually. On one hand Balaka being in the Great Rift Valley experiences varied climatic changes with temperature range of 14 degrees Celsius to 32 degrees Celsius. The annual average temperature revolves around 28 degrees. Highest temperatures are experienced in areas close to Shire River.

The rainfall season for Ntcheu District runs from December to April. The annual rainfall ranges from 600mm to 1200 mm. However, the rainfall pattern varies significantly depending on altitude. Since the road lies in the Bwanje Valley the areas surrounding it have a mean rainfall of 600 mm. On the other hand, the average annual rainfall on the Balaka side is 900 mm. Most of the rains fall in November.

Rainfall days have been constantly decreasing from 127 days/season in 2012/13 to 68 days/season in 2015/16. Communities are aware of basic climate change issues, but there is need to intensify adaptation and mitigation measures such as conservation agriculture, catchment management, and crop and livestock production practices. There is need to promote and disseminate information for early warning preparedness, response, and recovery to disaster.

The project area is prone to various disasters. Participatory vulnerability analysis with communities ranked the following disasters in order of importance and frequency: dry spells, floods, windstorms, and migratory pest outbreaks. Since 2000, the incidences of disasters have become more frequent with far-reaching impact on the population, economy, and environment. The most flood-prone rivers are Nkasi, Shire, Rivirivi, and Mulunguzi. When these rivers and other streams flood, public infrastructure, houses, property, and crops are destroyed and some people lose their lives.

4.1.5 Vegetation





The area has three main types of vegetation: closed canopy woodland, woodland/savannah (mixed species), and Mopane woodland. Other small areas are covered with perennial wet grassland (Shire Valley) and open canopy woodland of hills and scarps. The vegetation of the areas in which the passes is primarily Dry Savannah Woodland. Part of the area is semi-evergreen forest, while the other part is made of wetlands. 'Miombo' Woodlands comprise forestlands in the hills and escarpments on the Balaka side. Wetland vegetation consisting of perennial wet fringes is found between Chendausiku and Liwonde Turn-off with natural tree species like *Faidherbia albida* (Nsangu), *Adansonia digitata* (Mlabe), *Bauhinia thonningii* (Chitimbe), *Ziziphus sp.* (Masawu), *Colophospermum sp.* (Tsanya), *Dalbergia melanoxylon* (Phingo), and *Terminalia sericea* (Naphini). These trees are visibly seen along the road.

However, the natural vegetation has been greatly reduced and disturbed in recent years due to cultivation and urbanization. The few remnants can be found along river banks, in graveyards and within inaccessible areas of upper slopes on the plateau, hills and escarpments. Most of the vegetation has been replaced by exotic bluegum, gmelina and other tree species. These tend to be major sources of firewood, timber and charcoal burning.

Many lower plants are unknown to the people due to lack of expertise to thoroughly study them. Indigenous plant species dominate most rural areas. Some rare species of plants found include: *Chlorophytum sparsiflorum*, *Kniphofia splendida*, *Panicum brevifolium*, *Tripogon modestus*, *Urginia mandalensis*. Unthreatened plant species include: *Aloe christianii*, *Aloe duckeri*, *Aloe swynnertonii*, *Scadoxus multiflorus*, *Gonatopus boivinii*, *Asparagus africanus*, and *Asparagus setaceus*.

The other prominent vegetation along the road are grasses and cultivars. Grasses include *Pennisetum glauca* (Nsenjre), *Hyperrrania lufa* (Tsekera), *Phragmites sp.* (Bango) and *Zea mays* (Chimanga)

Table 4.1: Some plants commonly observed along the road

	
<p>A: <i>Adansonia digitata</i> (Mlambe)</p>	<p>B: <i>Mussa paradisiaca</i> (Nthochi) and <i>Zea mays</i></p>
	
<p>C: <i>Kigeria Africana</i> (Mvunguti)</p>	<p>D: <i>Pennisetum glauca</i> (Nsenjere)</p>

Conservation of vegetation is an integral part of infrastructure development. In the case of the rehabilitation of roads traffic detours might lead to clearing of such vegetation.

4.2 Socio-Economic Characteristics

4.2.1 Ethnicity

The project area population is made up of several ethnic groups. These include Yao, Ngoni, Lhomwe, Mang'anja, Chewa, and Sena. The Yaos constitute about 40% and the other groups make up the remaining 60%. The Ngonis are found mostly along the boundary with Ntcheu, the Senas and Mang'anjas are concentrated in the Shire North area, and the Lhomwes and Yaos are found in the rest of the areas.

4.2.2 Languages

The most widely spoken language in the districts is Chichewa. It is spoken by 66% of the population. 40% of the population speak Yao. A good percentage speak more than one language, particularly Chichewa and Yao .

4.2.3 Religion

The dominant religion amongst the Yaos is Islam while other tribal groups mainly practice Christianity. These two major religious groups live in harmony and equally participate in development activities in the project area.

4.2.4 Demography and settlement

This section describes the population of Balaka District as it relates to human settlement and health services.

4.2.4.1 Population and characteristics

The projected population of Balaka district in 2017 was 422,925 (NSO, 2008). The district has ten Traditional Authorities (TAs): Amidu, Chanthunya, Kachenga, Kalembo, Nkaya, Nsamala, Sawali, Phalula, Toleza, and Matola. The annual population growth rate for the district is 3.5 per 1,000 population . Population distribution of the district by TA indicates that TA Nsamala is the most populated, claiming 23.5% of the total population (refer to Table 4.2).

Table 4.2: Population of Balaka district by TA

Traditional Authority	2017 projected population	Estimated households
Senior Chief Nsamala	99,222	19,844
TA Amidu	36,162	7,232
TA Chanthunya	58,791	11,758
TA Kalembo	73,581	14,716
TA Nkaya	63,893	12,779
TA Sawali	11,113	2,223
STA Kachenga	43,042	8,608
STA Matola	8,608	1,722
STA Phalula	24,208	4,842
STA Toleza	4,305	861
District Totals	422,925	84,585

Balaka's population density was 115 persons/km² in 1998 and 145 persons/km² in 2008 (NSO, 2008). The 2017 projected population density for Malawi as a whole is 188 persons/km², while Balaka's 193 persons/km². This indicates that the population

density for Balaka is increasing. The rising population density exerts enormous pressure on available land and this is a major cause of resource-related conflicts in the district.

4.2.4.2 HIV and AIDs

The Malawi District Health Survey (DHS) of 2010 indicated a national prevalence of 10.6% among adults. It was estimated that 930,000 adults were HIV positive in 2009 (UNAIDS, 2010). There are an estimated 70,000 new HIV infections in Malawi annually. A summary of Balaka's OPD cases in Table 4.3 summarises trends in HIV prevalence in the district.

Table 4.3: Balaka OPD utilization (2013-2016)

Disease/conditions	2013	2014	2015	2016
Number of 15-49 year olds receiving HCT and sero-status	25413	25428	32088	14655
Number of 15-49 year olds tested HIV positive	3117	2652	2884	808
Number of HIV-positive persons receiving ARV treatment	5908	6581	10580	1182
Number of pregnant women receiving HCT and sero-status results	12156	14809	18183	5140
Number of pregnant women tested HIV positive	1123	1067	980	191
Number of HIV-positive women enrolled in PMTCT	3395	1209	1736	282
Sexually transmitted infections (new cases)	5156	4705	4744	1729
Syphilis in pregnancy	13	32	59	24
Number of 15-19 year olds confirmed HIV positive (new cases)	2493	2259	2377	1003
Opportunistic infections (new cases)	313	948	723	98
Under-5 malnutrition (new cases)	964	1787	1488	618

(Source: DHIS2 Balaka Fiscal Year 2013-16 (MOH-CMED, 2013-2016))

4.3 Economic Environment

Commercial and industrial activities in Balaka are also at a small-scale level. The major industrial activities are lime making and cotton ginning while commercial activities are mostly retail and petty trading. Balaka has vast potential for commercial and industrial activities due to its location, the road and rail networks. Balaka district has a lot of tourism potential from the Shire River and Liwonde National Park. Currently hospitality is good as the district has a bed capacity of 570 from its various hotels, motels and lodges.

Household income in Balaka is mainly from Income Generating Activities (80.3 %), fisheries and Agriculture (12.2%) with the rest coming from household businesses (3 %), casual labour (2.6 percent) and salaries and wages (1.9%).The main economic activity of the district is farming and it accounts for 87.6% of the population. Per

capita expenditure for the population of Balaka is at MKW20, 019.00 and this mainly goes to food 61.4 %, utilities 23.7% and clothing 3.9 %.

4.4 Agriculture

The majority of arable land in the district is grown with maize, followed by cotton then pulses. The area under maize has been relatively stable since the 2012/13 season, but the amount of land under cotton has drastically dropped from 45,782ha in the 2011/12 season to 14,993ha in the 2015/16 season, representing 67.3% decline.

Balaka contributed 0.81% and 11.0% of the national maize and cotton production in the 2015/16 season. Maize is considered a major food crop in the district, hence market prices have little influence on the decision to produce; rather, the extent of coverage of residual moisture, floods, and access to inputs influence the area allocated to maize.

On the other hand, production of cotton is highly dependent on market dynamics and, to a lesser extent, the prevailing climatic conditions. Low market prices continue to threaten cotton production in the district and this is one of the key issues to be addressed by the district in the next five years. When prices are low, farmers' willingness to grow cotton decreases, hence the area allocated to cotton decreases in subsequent seasons.

Pulses are the third major crop in terms of land allocation. Production has been stable except in the 2015/16 season when land allocation to pulses dropped from 10,446 to 497ha. The main factor attributed to this drop is dry weather conditions.

Figure 4.1b shows production volumes of major crops grown in the district in metric tonnes. Changes in area allocated to the crops and yield per hectare are the major factors influencing production levels. Maize remains the most important crop in terms of production volumes, although production has been unstable over the years. Sweet potatoes and cassava have contributed considerably to production volume as a result of NGO support in the form of seed and production technologies in response to recurrent dry spells. This support needs to be sustained and extended to cotton as a major cash crop in the district.

While the area under maize and cotton in the district is considerable the yield of these major crops has been declining in Balaka, hence provoking an urgent call for attention to avert the trend. The average national yield for maize and cotton for the past 10 years has been 1,600 kg/ha and 750 kg/ha respectively.

Main factors contributing to low crop productivity include dry spells, market prices, floods, poor seed quality, pests and diseases, inadequate use of inputs, untimely planting, and poor agronomic practices. There was heavy infestation of cotton bollworms in 2011/12 while mealy bugs devastated the 2014/15 and 2015/16 crops. In order to address issues of production and productivity, the district needs to conduct a thorough situation analysis, including farm holdings, soil properties in specific EPAs, rainfall trends, agricultural markets, extension delivery services and systems, capacity levels, and contribution of other players to the sector.

4.4 .1 Agricultural land holdings and farming families in the district

Balaka district has a total area of 211,716ha of which 188,062ha is under customary land and is used by smallholder farmers and a few estates. About 96,557ha of customary land is under crop production while the remaining area is under either forest use, human settlement, or other uses (Table 4.3).

Table 4.3: Land holding

Resource	Hectares
Total Land Area	211,716.00 (2193 km ²)
Customary	188,062.00
Estate Land:	9,800.00
Total Area under Cultivation	156,671.60
Total Wet Land	19.513
Forest Areas:	36101.60
National Parks	2316.10

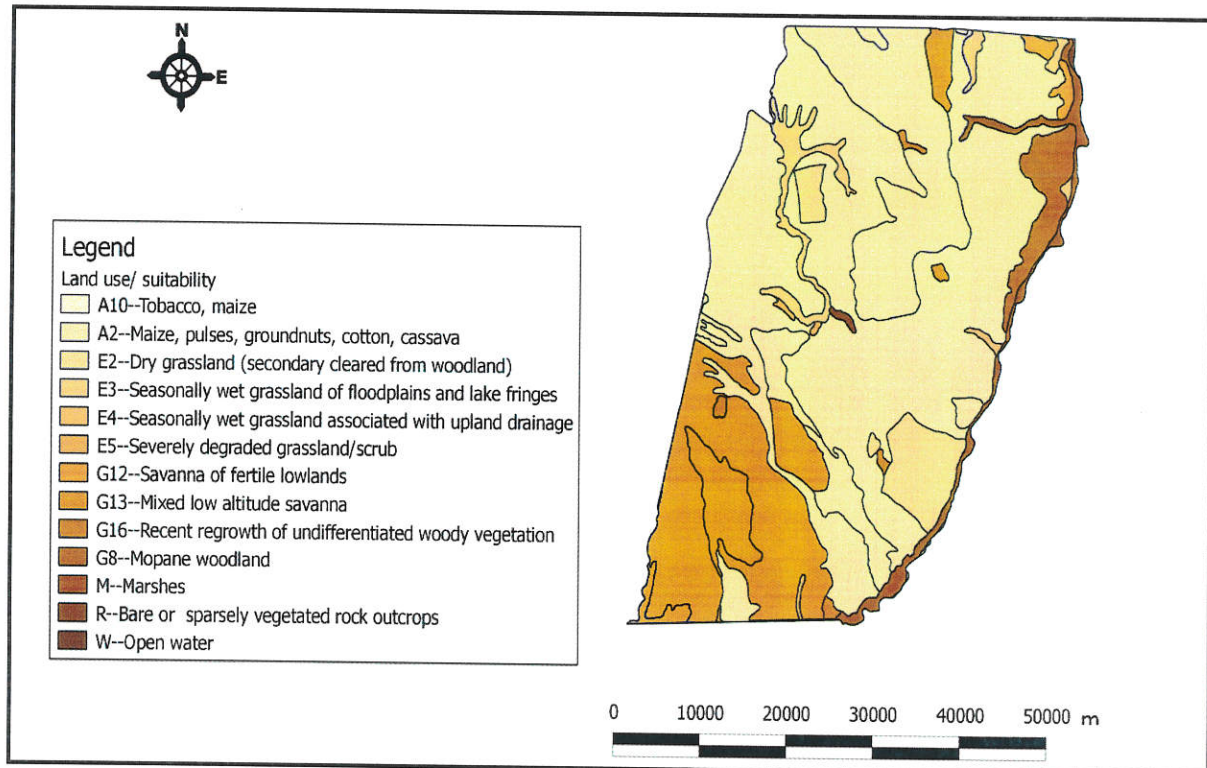
Source: DADO office, 2017

Smallholder subsistence farmers constitute the majority of the farming community in Balaka. The average landholding size per farming family is estimated at 0.6 ha. The total number of smallholder farm families in the district is currently estimated at 137,503 (MHH 65375, FHH 72128).

There are only two estates in the district, namely Demeter located in Mpilisi EPA and Toleza in Bazale EPA. Demeter and Toleza estates cover an area of approximately 8,000ha and 1,800ha, respectively. Demeter estate mainly grows maize and beans year-round under pivot irrigation for seed multiplication purposes. Toleza estate mainly grows cotton, maize, and *Jatropha* and rears dairy cattle.

The weather patterns, coupled with soil type, across the EPAs have dictated the type and nature of agricultural enterprise suitable for the specific agro-ecologies. **Error! Reference source not found.**4 highlights the suitability of different crops in the district. As indicated in the map below, the district has a potential to scale up agricultural production.

Figure 0.4: Land use suitability for Balaka district



(Source: Balaka socio-economic profile 2010-2013)

Figure 4.3 above shows most of Balaka's land is suitable for tobacco, maize, pulse, groundnut, cotton, and cassava production. Lakeside areas and seasonally wet grasslands in floodplains offer potential for irrigation development.

It is estimated that there are 137,503 farming families in the district, with the highest concentration in Ulongwe, seconded by Balaze. Women comprise the highest numbers of farming families in all the EPAs except Rivirivi and Utale. The concentration of farming families in specific EPAs, alongside other factors, may guide investment planning and allocation of resources.

4.4 .2 Agriculture markets

Effective marketing of agricultural produce is critical to household food security and income. Malawi is a party to the Regional Indicative Strategic Development Plan (RISDP) which rests on four pillars, one of which is industrial development and market integration. The majority of households in the district rely on markets for agricultural produce sales and food purchases. Traditionally, the farming community in Balaka relied on ADMARC markets as a place to market their produce, purchase agricultural inputs, and purchase foods, especially maize. ADMARC markets operational in the district are Khwisa, Mbera, Sawali, Kachenga and Balaka in Bazale EPA; Chiendausiku, Kwitanda, Mmanga, and Mpilisi in Mpilisi EPA; Thcona, Nyanyala, and Mfulanjovu at Phalula EPA, Chanthunya at Rivirivi EPA, and Chibwanansamala and Ulongwe and Ulongwe EPA.

Other sources of agricultural inputs include farmer organizations, agro-dealers, and the private sector which are spread throughout the district, including NASFAM, OPS

General Dealers, SFFRFM, Agora, Kulima Gold, Chipiku, Iponga, and other shop outlets. For cotton farmers, ADMARC offers a ready market including other markets like Iponga, Clark Cotton, Afrasian, Great Lakes Company and Malawi Cotton Company. The markets for agriculture products are spread through the District. There are 35 designated trading centres in the district where agricultural markets operate. The district is promoting market-led production through agribusiness; hence, there is potential to increase agricultural production and boost the project area economy. Cotton marketing institutions are particularly targeted for price harmonization and market-oriented production.

4.4 .3 Livestock production

The livestock sector plays a crucial role in the agricultural economy. The major livestock reared in the district include cattle, goats, rabbits, poultry, and pigs. Livestock is raised mainly as a source of income, food, and prestige. It is also used to pay dowry and meet needs during festivals. Table 4.5 below shows major animal products produced in 2015/16.

Table 0.5: Livestock raised in the district and tonnage of animal products produced

Commodity	Census	Slaughters	Meat (tons)	Hides & skins
Cattle	21,891	134	27	134
Goats	236,367	16,103	240	16,103
Sheep	14,206	971	18	971
Pigs	94,282	17,554	161	17,554
Chickens	3,767,258	Not recorded	Not recorded	Not applicable

(Source: DAO, 2017)

Table 4.6 below shows population growth of livestock species in the past 5 years.

Table 0.6: Livestock population and population growth in the district (2011-2016)

	Population					% increase over previous year	
	2011/12	2012/13	2013/14	2014/15	2015/16	2013/14	2015/16
Cattle	15,740	16,303	17,299	20,124	21,064	6.1	4.7
Goats	204,476	200,718	210,817	211,643	218,517	5	3.2
Sheep	16,323	15,620	16,714	14,775	14,365	7	-2.8
Pigs	54,715	59,707	62,851	67,243	69,271	5.3	3
Rabbits	139,280	128,569	131,224	157,169	153,619	2	-2.3
Chickens	2,020,137	1,905,175	1,906,165	3,635,148	3,767,258	0.1	3.6
Guinea fowl	213,457	249,974	250,087	250,323	251,341	0.04	0.4
Ducks	143,422	156,420	158,216	160,141	161,324	1.1	0.7
Dogs	14,630	15,449	15,423	16,358	16,430	-0.2	0.4

(Source: DAO, 2017)

There has been a steady increase in the number of livestock in the district except for sheep and rabbits; however, the increase is lower than the increase in human

population. As such, the number of livestock per person is decreasing. Phalula and Utale have the highest and second highest number of goats, respectively. Pigs are most frequently stocked in Utale and least stocked in Rivirivi. Amongst the livestock kept in Balaka, sheep and chickens made the highest contribution to national figures in 2015/16 with 5.21% and 4.82%, respectively. Goats were third at 3.34%, pigs at 1.90%, and cattle at 1.46% (2016 Annual Economic Report).

4.5 Education

Balaka district complies with Malawi Growth and Development Strategy III (MGDS III) and considers education and skills development key for socio-economic development; industrial growth; and economic empowerment for different groups of people especially women, youth, and disabled persons. Education also has a strong impact on literacy; behaviour in terms of reproductive, maternal and child health; and HIV and AIDS awareness. By building an educated and highly-skilled population, the Balaka education sector will not only contribute to accelerated economic growth and development in the district, but also the achievement of the Africa's 2030 agenda and, subsequently, the Sustainable Development Goals (SDGs).

4.5.1 Literacy Rate

Balaka district has an overall literacy rate of 64% (NSO 2008) which is equal to the national overall literacy rate for Malawi (NSO, 2008). According to the NSO, 2008 literacy rate for males in Balaka district is 69% and equal to the national literacy rate for Malawian males, while the literacy rate for females in Balaka district is 60% which is higher by 1% than the national literacy rate for Malawian females. Balaka town has the highest literacy level of 86.8% and 84% for males and females while Kalembo has the lowest with only 61.1% and 50.3% of the male and females being literate.

4.5.2 Total number of schools by level

The district has 165 primary schools of which 161 are public primary schools and four are registered private primary schools. These primary schools are grouped into twelve education zones, each of which has an average of around thirteen schools. The biggest zones are Mmanga and Ulongwe that each have seventeen public schools while the Boma Zone is the smallest zone with eight public primary schools only.

The twelve zones are managed by Primary Education Advisors (PEAs). Each zone has one PEA, except Mponda and Mmanga zones that each have two PEAs, giving 14 PEAs in the district. These PEAs are closely monitored and coordinated by a Coordinating Primary Education Advisor (CPEA) who is based at the office of the District Education Manager (DEM). Of the 14 PEAs, only 4 are at substantive grades (having attended and passed interviews for PEAs), while 10 are on administrative arrangements. Of the 12 zones, only 7 zones have purposely build Teacher Development Centres (TDCs). For the five zones that do not have purpose-built TDCs, the PEAs live away from the TDCs and use classrooms as their halls, offices, and store rooms. These zones are Chiendausiku, Maduwani, Mpilisi, Mponda, and Nkhonde.

The district has 26 secondary schools, of which 15 are public secondary schools and 11 are registered private secondary schools. Of the 15 public secondary schools, only one is a district boarding secondary school while the rest are community day secondary schools.

4.5.3 Primary education

The National Education Plan (NEP) identifies primary education as the longest existing sub-sector attended by the largest number of learners. The fundamental objective of primary education is to instill basic literacy, numeracy, and life skills, and it is recognized as the foundation for secondary and tertiary education levels. The official entry age to primary education is 6 years, meaning that the expected primary school-going age population is within the range of 6 to 13 years. However, because of late entry into the system and high class repetition rates, the system is also characterized by a significant percentage of children who are either under or over the official maximum age of 13.

The primary cycle is eight years from standards 1 to 8. At the end of Standard 8, learners sit for a standardized national examination called the Primary School Leaving Certificate Examination (PSLCE) which determines their eligibility for secondary education. According to the NEP, the provision of primary education was solely undertaken by the government until 2004 when a national policy authorized primary education provision by private institutions. However, private primary schools play a small role in the provision of primary education in Balaka district. Currently, they contribute only 2.8% of total primary enrolment in the district against 10% of national primary enrolment attending private schools.

The pupil dropout rate has been fluctuating for both boys and girls. It increased slightly from 3.3% for both boys and girls in 2012 to 3.9% for girls and 3.8% for boys in 2013 then started declining sharply to 2% for girls and 1.9% for boys in 2015 before rising to 2.2% for both boys and girls in 2016. While it is difficult to explain the slight increase in 2013 and 2016, the overall decrease can be attributed to interventions such as school feeding by Mary's Meals in 67 schools, YONECO's Learn Without Fear project in 75 schools, Save the Children's ASPIRE project, Save the Children's Reducing Teen age Pregnancies (RTP) programme, and others. Additionally, improvements in the learning environment through construction of classrooms and toilets by the Malawi government through the Local Development Fund (LDF) and development partners such as World Vision, Goal Malawi, Build on, Eagles Relief, USAID, and many more is attracting learners, especially girls, to remain in schools. There is a need, however, to reduce the dropout rate further through various interventions.

While it is difficult to explain the pass rate decrease from 2012 to 2014, it is thought that the increase in PSLCE pass rate registered from 2015 to 2016 might be attributed to an increase in the number of qualified teachers and interventions by development partners who had been providing professional continuous development training to teachers through Early Grade Reading Activity (EGRA) and ASPIRE.

The average pass rate for girls steadily decreased until 2016 when it increased tremendously. In addition to more teachers, the increase in pass rate for girls can be attributed to interventions by development partners through projects such as ASPIRE and Reducing Teenage Pregnancies (RTP) that work with girls either directly or through mother groups.

4.5.4 Secondary education

Secondary education in Malawi runs for four years, with two years of junior secondary and two years of senior secondary. After two years of secondary education, students sit for Junior Certificate Examinations (JCE), after which they obtain a Junior Certificate of Education which qualifies them to enter senior secondary. After the subsequent two years, students sit for Malawi School Certificate Examinations (MSCE). According to the National Education Sector Plan (NESP), the introduction of free primary education in Malawi in 1994 resulted in a large increase in primary enrolments and this put pressure on places for secondary education which did not expand at the same rate as the primary sub-sector. While national access rates to Form 1 is 46%, access rate to public secondary schools was 28.85% in 2016. There are disparities according to gender (in favour of boys), location of schools, income of parents and/or guardians, and physical ability of students. Orphans and other vulnerable children (OVCs) are disadvantaged.

Overall enrolment (public and private schools) increased from 4,693 in 2012 to 6,204 in 2016; however, public secondary schools have larger enrolment than private secondary schools. In fact, private secondary schools constitute 24.8% to the overall enrolment of secondary schools.

4.5.5 Primary Education

There are 165 primary schools and 26 secondary schools in the project area. There are 161 public primary schools (religious and government). Of these, 119 are full primary schools (with standards 1 to 8) while 42 are junior primary schools (with less than 8 standards). Of the 165 primary schools, 61.2% are owned by religious organizations (Catholic, CCAP, Anglican, and Muslim Association of Malawi), 36.4% are owned by government, and 2.4% are owned privately. There are 26 secondary schools in the district, of which 15 are public secondary schools (9 government and 6 religious) and 11 are private secondary schools. Table 5.28 summarises the number of primary and secondary schools by ownership. The large number of private secondary schools is due to limited number of public secondary schools in the district.

4.6 Security

Balaka police service remains the major player in enforcing security while the judiciary enforces adherence to the rule of law by providing fair trial services. This creates a secure and an inducing environment to invest and do business in Balaka. This is consistent with goal number 16 of SDGs which seeks to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build

effective, accountable and inclusive institutions at all levels. Through the police services, community policing groups are established, and together with private security companies, contribute to providing security. Balaka Police Station was delinked from Machinga on 17th June 1998 and covers an area of 2,193 square kilometers. It has tremendously grown in terms of social and economic activities including the rise in criminal activities as well as Gender Based Violence. The population served by Balaka has been increasing from 316,748 in 2008 to 409,420 as of December, 2015. The district has three operational Police formations with Balaka as a Parent Station, Phalula and Ulongwe as Police Units. Two other Police formations under construction are at Kachenga and Utale but the main challenge is lack of staff houses. It has also a permanent Road Block at Chingeni and a Listening Unit at Balaka Bus Depot.

This section gives an analysis of the status and trends security and governance issues including crime management, prosecution, community policing and road traffic management.

The crimes most commonly committed in the district are general thefts, home robberies, and assaults. 65% of crimes are committed in Balaka township and surrounding areas, while Phalula and Ulongwe contribute 15 and 20% respectively. The most areas most affected by crime are Balaka central, Mgawanyemba, Mangerengere, Majiga 1 and 2, Phalula, and Ulongwe.

The decrease in crime rate in 2014 is attributed to initiatives that were put in place such as day and night patrols, mounting of ad hoc/snap roadblocks, sweeping exercises, community and stakeholder sensitization meetings, and establishment of community policing structures. However, in 2015 the crime rate increased by 29.8%. This is attributed to inadequate financial resources, inadequate transport, and lack of equipment such as reflectors and torches.

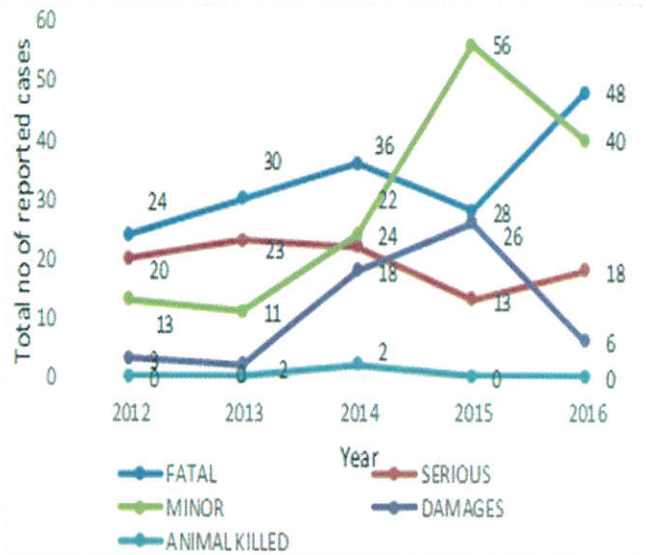
4.7 Road safety and accidents

The majority of road accidents occurring in Balaka between 2012 and 2016 were fatal (Figure 4.6). The trend of fatal accidents has increased over the years, except in 2015 when it slightly dropped.

The accident prone areas are Kapalamula, Sosola, Balaka Town, Mpulula, Liwawazi, Chiendausiku along Balaka-Liwonde Road, Mpale and Mwima along Mangochi-Liwonde Road, Phombeya, Kanono, Mwanga, and Phalula along Balaka-Zalewa Road.

Chingeni to Liwonde, Mangochi turn-off to Ulongwe, and Chingeni to Phalula have seen more vehicles on the road. The road from Chingeni to Liwonde is not in good shape and causes accidents. Balaka has had an influx of pedal cyclists/bicycle taxi operators (kabaza) in town. These three factors (more vehicle traffic, poor road quality, and more bicycle traffic) contribute to the increase in road accidents in the district.

Figure 4.6 : Road accidents fatality (2012-2016)



4.8 Gender-based violence

Gender-based violence is managed by victim support units which are components of community policing. The component also handles property grabbing, child abuse, and domestic violence. The unit handled 480 cases in 2012, which increased to 610 cases in 2013, and decreased in 2014, 2015, and 2016 by 7%, 8.2%, and 5.9% respectively. The decrease in gender-based violence suggests the district is on the path to curbing gender-related crime. The district has victim support units at Balaka police station, Phalula, and Ulongwe police units as well as in all TAs and STAs. The units advise and counsel; conduct private interviews; mediate; provide First Aid; monitor and follow up cases; provide food, safe night, and transport to stranded victims, and make referrals were necessary.

Two major options that were considered for the project. The environmental and social implications of each have been considered in selecting the project option.

5.1 Zero Option

This options means that the project will not be undertaken and the road will be left as it is. Under this option the Malawi Government will lose out and there will be an ensuing economic disruption mainly between the Southern, Central and Eastern parts of Malawi as a whole. The road will continue to deteriorate and Government expenditure on maintenance will accumulate. The expected revenue arising from international trade will be lost. This option is therefore not suitable.

5.2 Undertake the Rehabilitation of the Road

Under this option the road will be upgraded it to a 7 metre carriageway and 2 metre sealed shoulders at a design speed of 80km per hour and 50 km per hour . Within this option, consideration was given to the technical options for rehabilitating the road as follows:

- **Patch and seal** - This is considered the easiest of them all. This would just require patching and sealing existing ruts and leave the existing engineered road with poor horizontal and vertical alignment as it is. In terms of minimizing adverse environmental and social impact this option has advantages because nature and scale of the works will be such that no significant adverse impact will be created. However, from the viewpoint of overall environmental/social performance, the poor horizontal and vertical alignment creates a safety hazard and potential beneficial impact will be forgone by this minimal option.
- **Strengthen existing pavement** – This could include placement of an asphaltic concrete overlay, or an overlay crushed stone base directly on top of the existing bituminous surface, which has been lightly broken to allow for internal pavement drainage. The problem with this option is that it will only strength the existing pavement by only applying an overlay of crushed stone base on top of the existing bituminous surface without improving the road alignment in terms of it horizontal and vertical structure despite of the road poor condition. This can also be a safety hazard and might not be the best option either.
- **Pavement reconstruction/replacement/recycling** –This implies the placement of an all weather road on the existing alignment with the road horizontal and vertical curves and road width improved to Malawi's RA road standards to improve sight distances and reduce steep climbs. The road pavement is upgraded to bituminous surfacing with modified horizontal alignment. This alignment option is modified in isolated cases to reduce demolition of property, destruction of trees, avoid large

cut/fill lengths. The pavement option is bituminous material. This is the preferred option as the potential benefits are considered to outweigh the disadvantages and in terms of overall environmental and social performance.

CHAPTRE SIX: IMPACT IDENTIFICATION AND ANALYSIS

This chapter presents the method used to predict and assess both negative and positive impacts of the project.

6.1 Environmental Criteria

The environmental criteria applied in the screening process was determined on the basis of applicable EIA guidelines for Malawi and other considerations. As such, the screening addressed:

- a. Physical Resources: Physical resources are generally defined to include topographic, soils, geological conditions, hydrology, climate and air quality.
- b. Natural/Biological Resources: The natural/biological aspects of the potentially affected environment including fauna (wildlife), flora (plant species), aquatic habitat and protected areas.
- c. Other environmental concerns: describes other aspects of the environment including land use/controls, use of natural resources, energy, conservation, the built environment, historic and cultural resources.
- d. Social concerns for consideration include socio-economic, public health, safety, noise and other infrastructure networks.

6.2 Impact Identification

The study used the Environmental Assessment Scoring Scale (EASS) to identify major social and environmental impacts of the project. The scoring was based on information obtained from literature review of similar projects, expert opinion, public consultations (FGDs), professional judgement and field observations.

6.2.1 Description of Parameters in the EASS Matrix

The matrix contains seven parameters for rating the impacts. The columns provide a description of the scores with +1 representing a low impact and +5 a high one. Negative impacts are assigned a minus sign and positive impacts a plus sign and their severity increases in the opposite directions. For negative impacts a score of -1 represents a low or minimal impact as -5 represents a high level. The scores for each impact are added to give composite scores. The scores of each impact are added to give composite scores. A negative Gross Net Score (GNS) would mean that the project has an overall negative impact on the environment while as positive Gross Net Score would mean the entire project generates net benefits to the people and the environment.

- a. Significance (Importance of impacts)

Low significance is rated -1 or +1 and this means that the impact is low resulting in small change in the environment that is hardly detectable. Significance rating of +5 or -5 means that the impact is very high.

b. Magnitude of Severity of Impacts

Low magnitude is rated +1 or -1 and high magnitude is rated +5 or -5. A low magnitude means that the impact is less severe and may occur on project site only while a high magnitude means that the impact will be more severe/serious and may occur beyond the project site.

c. Probability

This is the likelihood that the impact will occur if the mitigation is not applied. The lowest probability is rated +1 or -1 and measures that the impact may occur but not probable. The highest is rated +5 or -5 and means that the impact is avoidable or definite.

Permanence

This refers to the duration of the impact. Short-term impacts are rated +1 or -1 and long-term impacts are rated +5 or -5.

d. Boundary Effect

Low effects of +1 or -1 which means that the impacts are localized within the area where the project activity is being implemented. High-level effects of +5 Means the impacts can be spread far beyond the project area where the activity is being implemented but not far from the project site.

e. Reversibility or enhancement of Impacts

A low level of reversibility rated -5 means that it is difficult to reverse the negative impact while a high-level of reversibility rated as +5 means to easy to reverse their possibility to enhance the effects of an impact .

f. Accumulation of Impacts

This refers to the build- up of impacts over time. The occurrence of one impact can enhance or aggravate the other resulting in an increase in their effects over certain period of time. A rating of -1 means a high extent of enhancement of impacts. A rating of -1 means a low extent of aggravation and +1 a low extent of enhancement.

Table 7 that follows presents the result of the EASS. The impacts evaluated in the EASS were identified in the screening process. The activities associated with these impacts have been explained in the discussion that follows the analysis of these results.

Table7: The EASS Impact Evaluation Results

Nature of Impact	Significance	Magnitude	Probability	Permanence	Boundary Effect	Reversibility	Accumulation	Total Scores
Positive Impacts (Rated on + 1 to + 5)								
Creation of employment opportunities	+5	+2	+4	+1	+5	+5	+3	+25
Reduction in travel time	+5	+5	+5	+5	+3	+5	+5	+33
Skills transfer to local community and civil engineering sector	+3	+4	+4	+5	+3	+5	+5	+29
Women empowerment	+3	+1	+2	+1	+1	+5	+3	+16
Creation of market for goods and services	+4	+3	+3	+4	+3	+5	+3	+25
Improved linkage to markets, hospitals and other social amenities	+5	+4	+5	+5	+4	+4	+4	+31
Economic growth	+3	+2	+3	+4	+3	+3	+3	+21
Increased foreign exchange	+2	+2	+2	+4	+3	+3	+3	+19
Improved scenically beauty	+2	+1	+5	+4	+1	+4	+3	+20
Improved access to places of tourist attraction	+3	+3	+5	+4	+3	+4	+4	+26
Improved safety for motorists	+2	+1	+1	+4	+3	+4	+3	+18
Improved human health	+3	+4	+5	+4	+1	+4	+4	+25
Total Positives	40	32	44	45	33	51	43	+288
Negative Impacts (Rated on -1to-5)								
a) Physical Environment								
Increased soil erosion and sedimentation	-5	-5	-5	-2	-2	-1	-5	-25
Decline in water quality	-4	-3	-3	-2	-5	-2	-2	-21
Disturbed natural hydrology	-2	-2	-2	-1	-3	-1	-3	-14
Disturbed natural topography of the area leading to land Degradation due to Borrow Pits:	-2	-3	-4	-2	-1	-2	-3	-17
Increased generation and improper disposal of solid waste	-5	-4	-5	-1	-2	-2	-3	-22
Noise and Vibration	-4	-4	-5	-3	-2	-1	-1	-20
Air pollution and climate change from dust Emissions and exhaust fumes	-3	-1	-5	-1	-4	-4	-3	-21
b) Biological Environment								
Loss of flora and fauna	-3	-2	-3	-2	-1	-3	-2	-16
Disturbance of aquatic habitat	-3	-2	-3	-2	-4	-2	-2	-18
c) Social Environment								
Resource access restrictions and altered	-2	-2	-4	-1	-1	-4	-1	-15

livelihoods.								
Displacement and Resettlement of project affected persons	-5	-5	-4	-4	-3	-1	-1	-23
Increased ambient noise and vibrations	-3	-3	-4	-1	-2	-3	-1	-17
Decline in scenic quality	-1	-1	-3	-1	-1	-2	-2	-11
Poor sanitation due to the influx of people	-5	-5	-5	-1	-2	-2	-2	-22
Disturbance of traffic movement	-4	-3	-5	-1	-2	-1	-1	-17
Occupational safety and health risks	-5	-4	-4	-1	-1	-1	-1	-17
HIV/AIDS risk	-4	-3	-4	-4	-5	-3	-5	-28
Encroachment of the road reserve	-5	-5	-5	-5	-1	-1	-2	-24
Theft and Vandalism of Road Infrastructure:	-5	-5	-5	-5	-1	-1	-2	-24
Visual intrusions	-1	-1	-3	-1	-1	-2	-5	-14
Total Negatives	-71	-63	-81	-41	-44	-39	-47	-386
Gross Net Score (GNS)								-280

6.3 Analysis of the EASS Results

The Gross Net Score (GNS) for the project is -280 as compared to -700 which is the maximum possible Gross Net Score for this evaluation matrix (Table 7) calculated as follows:

{7 columns* -5*16 identified negative impacts} - {7 columns* 5*10 identified positive impacts}

This translates into highly significant overall positive impact (-280) if we compare to the overall possible total scores of the positives(+288). This means that significant positive impacts on the socio-economic and biophysical aspect of the environmental will be enhanced *if checks and balances (appropriate enhancement measures) are put in place*. The evaluation matrix reveals that the reversibility of negative impacts is relatively high (-39) suggesting that mitigation measures can successfully be used to reduce the severity of the impacts.

As shown in table 7, The lowest positive impact scores is +16, recorded on *women empowerment*. This implies that the impact requires strong enhancement measures. On one hand, the highest negative impact score is -28 observed on HIV/AIDS risks. This means that these impacts require strong mitigation measures. The mitigation and enhancement measure are provided in this report inform of environmental and social management planning table 8 of chapter seven.

6.4 Discussion of the impacts

The discussion of these impacts is based on the results of the EASS. It focuses on the main impacts.

6.4.1 Positive Impacts

Positive impacts include:

a. Increased employment opportunity

One of the most direct positive impacts of the road project is creation of job opportunities for the road side communities. There will also be direct and indirect job opportunities for skilled labourers. Other opportunities will result from the general economic improvement of the area due to increased access and increased traffic flow which will create further indirect jobs. The contractor should enhance this impact by giving favourable consideration in offering the job to the surrounding local communities when such skills are available in that community.

b. Women empowerment

In addition to increased job chances at the construction site, income generating opportunities would arise from emerging demand for services such as restaurants, small shops and allied activities which tend to favour women who have demonstrated better preparedness than men to capitalize on them. This will also improve earnings and purchasing power of local people through opportunities to market commodities and produce to construction workforce. The developer (RA) should consider linking the already existing women business clubs to micro-financing institutions that would provide business support to such groups.

c. Stimulated businesses

There will be an increased demand for food, clothing and other amenities due immigrant workers. The local communities should therefore be sensitized of the impending business opportunities so that they are able to strategize on capitalization of their businesses which are normally characterized by inadequate capital. Local communities should be advised on how to obtain loan from micro financing creditors. The road should also be repaired regularly.

d. Improved delivery of goods and services

The rehabilitation of road will lead to vehicles moving at the appropriated speed and reaching their destination at the punctual time. This will in turn facilitate the quick flow of goods and services especially between the towns of Ntcheu, Balaka and Liwonde. To enhance this impact, the contractor should ensure that the road alignment adhere to the recommended designs.

e. Economic growth

Economic growth will be enhanced as accessibility and motorization of traffic in this area will be improved and a better marketing of agricultural produce will be assured. Due to increased traffic along this road, more roadside vendors will be attracted and this will lead to improvements in the general economy of the communities along the road. Timely reparation of the road would also enhance this impact.

f. Improved scenical beauty from the constructed road

The rehabilitation of the road will improve the scenical beauty especially in points where the road passes towns and trading centres. Improved scenical beauty enhances good sanitation practices in people. This eventually improves their health status. The contractor should construct bus bay shelters in appropriate place to complement the scenical beauty brought about by the road.

g. Access to places of tourist attraction

The rehabilitation of this road will support the provision of comfortable journeys to tourists when visiting places of interest in Malawi, like Mangochi. The project will reduce travel time to the Mangochi both from Central and Northern region. By ensuring installation of appropriate road safety signs this impact will be enhanced.

6.4.2 Negative Impacts

Negative impacts include:

6.4.2.1 Physical Environment

Key impacts of project operation on the physical environment include:

a. Increased soil erosion

Soil erosion could occur during the upgrading works. Erosion is often caused by failure to keep water off road surfaces. Soil erosion can be expected from areas where the soil is disturbed and exposed to runoff especially on roads that collect water and do not have enough side drainage to handle heavy precipitation or abnormal flooding. Clearing of vegetation cover, grubbing of the road reserve and cut and fill operations for widening the road, construction of bridges, culverts and site drains, detours for collecting construction materials from quarries/borrow areas will expose soils during rainy seasons and may result in incremental soil erosion and sedimentation of river courses.

Mitigation measures include restricting construction work to the dry season. Erosion levels can also be monitored during the operation phase and remedial mitigation measures such as bank protection, slope stabilization especially at box culvert bridges can be improved by building gabion walls and concrete retaining walls. Steep slopes should be planted with trees.

b. Decline in water quality

The main sources of water pollutants include campsites, storage areas and civil works. Effluent and runoff from campsites and storage areas can contain high levels of pollutants including human wastes, asphalt related compounds, persistent organic

pollutants, fuels and oils, lime and cement particles, detergents, heavy metals and corrosives from old batteries and antiseptic materials, salts and other elements.

As mitigation, the contractor should provide for proper waste disposal facilities more especially at the camps and storage sites. Interceptors should be installed where the stored substances are of a liquid form. The contractor must ensure that storage sites are located over 100m away from water sources.

c. Disturbed natural hydrology

Road works is normally associated with the disruption of the natural hydrology especially where the road crosses water bodies. The Liwonde-Nsipe Road crosses three notable rivers. Potential adverse impacts to surface hydrology and the rivers crossing the road in the construction phase of the project will be avoided through the enforcement of contract provision and oversight by RA.

Road drainage provisions and other rehabilitation activities are not expected to alter the current status of natural water bodies or irrigation structures in the vicinity of the road ways. In addition to adherence to good engineering and construction practices and the enforcement of contract provisions related to drainage during both the construction and operational stages of the project, sub contractors will be obligated to coordinate with local land use planning authorities. Contract provisions will ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.

d. Disturbed natural topography of the area

Road works involve activities that usually shake-up the soils. Such activities include excavation; borrow pitting, ground resurfacing and rock blasting. This results in the changing of the topography especially on sites which these activities are undertaken. As a mitigation the contractor will correct quarry from the already existing mine. Borrow pits should be filled and the open surfaces be rehabilitated and re-vegetated

e. Increase in generation of solid waste.

Almost all the waste generated, except gases are eventually disposed of on soil. This makes soil vulnerable to contamination especially if the waste is not biodegradable. One of the soil's greatest contaminants is the persistent organic pollutants (POPs). There are twelve most important POPs of which organochlorines are the most common in Malawi. POPs can stay in soils for over a century without any significant breakdown. The biggest sources of POPs during road construction include electrical installations, termite proofing and waste burning.

Abandonment of rubble and used-out equipment creates a potential of hazardous waste. These in most cases are accident spots for mostly children. The developer will ensure that all the used out equipment and rubble are deposited at the recommended sites by the Assemblies of Balaka and Ntcheu. The Assembly has committed to advise the developer about this site at that material time.

f. Poor air quality and climate change

During construction phase, potential sources of air pollutants include fumes and smog from vehicles and road construction machinery, waste burning, household and bush fires, huge fires from accidental or deliberate combustion of fuels and other materials, volatile substances such as fuels and solvents, asphalt fumes, civil works, blasting operations and quarry mining.

In order to mitigate this impact, water should be spread regularly in the traffic routes and any other surfaces that have been cleared. All grading works should be done only on surfaces with proper moisture content.

It is recommended that the contractor should ensure that all machineries are well maintained such that they do not emit fumes. Machinery should be located away from densely populated areas.

6.4.2.2 Biological Environment

The project's principal impacts on the biological environment are on species diversity, and terrestrial habitats.

a. Loss of flora

Direct impacts on terrestrial biodiversity will occur as a result of clearing land and vegetation for stockpile site preparation, new quarry and borrow pit sites (where applicable), access roads and construction of detours. This will lead to habitat destruction and loss of tree species along the road environments. Indirect impacts on terrestrial biodiversity are expected to occur as a result of increased population and improved access to the area. The road will make some areas, including the forest reserves, more easily accessible, particularly for wood poaching (charcoal and fuel wood markets in urban areas) and hunting of wildlife thereby increasing vulnerability of the natural forest and wildlife.

No endemic tree species were identified 50 meters from each side of the road. The impact on wildlife will be negligible as there is in any case very limited wildlife within the impact area. There are no protected wildlife conservation areas along the alignment. However some protected tree species common in that area will selectively not be removed. These include *Faidherbia albida* and *Pterocarpus angolensis*.

In order to retain the natural vegetation cover, sensitization would be undertaken on the use of firewood for cooking and other purposes. The contractor shall undertake to consult the Department of Forestry and local communities regularly on sustainable forest management and use. The use of other alternative of energy will need to be used more in place of firewood by work force and local communities.

b. Disturbance in aquatic habitats

Aquatic habitats are likely to be affected by activities during project construction. Impacts during construction could be generated by sedimentation caused by work in the river bed (sand mining, collection of water for construction work), erosion at construction sites, water pollution caused by oils, fuels and chemical use. Replacing culverts may also minimally affect the natural drainage systems and disturb vegetation and riverine aquatic species. Increased sediment loads can directly affect fish downstream through damage to or accumulation in their gills leading to death or sub lethal effects. Increased sediment loads will also indirectly affect fish through modification of habitats (e.g. rocky-river bed to mud-covered), destroy spawning sites, and reduce primary production and therefore fish food. Spills of fuels and chemicals may directly affect aquatic fauna or humans and animals feeding on aquatic products.

During construction, strict management and regulation of construction activities, including measures to minimize sedimentation, prevent and control fuel/chemical spills and scheduling of sediment-generating construction activities to occur during the dry season, should be implemented to mitigate construction related impacts.

6.4.2.3 Socio-economic Environment

Impacts to the socio-economic environment are as follows:

a. A threat to pedestrian and livestock safety

The rehabilitation of the road will encourage more traffic and higher vehicular speeds which would effect on road safety for pedestrians, cyclists, livestock and their owners. Particular attention has been given in project design to put in place measures that would enhance road safety like: provision of sealed shoulders, bus bays in settlements, improved road signs and markings and rumble surfaces. The contractor will implement traffic management at construction sites to enhance traffic flow and safety and public road safety awareness activities along roadside communities. Proper traffic signs shall be placed at all necessary sites in the construction area to reduce traffic congestion and safety problem associated with haulage of materials and the construction works.

b. Land take and material sources

The widening of existing road where necessary or creation of detours may require land take and may affect people's property like valuable trees. This may also lead to loss of agriculture land, associated social stress; and change in lifestyles and livelihoods. Residents of this area will also be affected by construction activities including disturbance, increased pressure on resources and services. Land take would also occur where land will be acquired for contractor's camps, gravel pits and hard stone quarries. However, the rehabilitation of the road is expected to cause minimal adverse impact. Minimum land take shall be done in areas of 18m right of way. Some old borrow pits and quarries will be used in order to minimize the impact. After

CHAPTER SEVEN: ENVIRONMENT AND SOCIAL MANAGEMENT MONITORING PLAN

AND

Tables 7.1 and 7.2 below present the Environmental and Social Management Plan (ESMP) and the Environmental and Social Monitoring plan respectively. These aim at the following:

- a) Reducing/minimizing potential impacts of the project activities;
- b) Enhancing socio-economic benefits of the project activities;
- c) Ensuring that impacts do not exceed legal standards
- d) Checking the implementation of mitigation measures in the manner described in the ESIA report; and
- e) Providing early warning of potential environmental and social damages.

Table 7.1: Environmental and Social Management Plan for the Rehabilitation of Liwonde –Nsipe Road

Activity	Environmental Impact	Mitigation/Enhancement Measure	Time Target	Responsible for Mitigation	Estimated cost (Mk)
a) Planning and Design Phase					
Conducting feasibility studies	Increased employment opportunities	<ul style="list-style-type: none"> Ensure that consultancy services are provided by local firms 	Jan-Dec. 2010	Roads Authority	000.00
	Induced stress due to fear of loss of property by the local communities	<ul style="list-style-type: none"> Conduct sensitization meetings to the local communities on the advantages of the proposed project 	July-Dec. 20210	Roads Authority	120,000.00
b) Construction Phase					
Construction of the road and	Women empowerment	<ul style="list-style-type: none"> Designate a special sheltered stand near camp sites where women could sell their commodities. Facilitate collection of debts from worker that are accrued from women that lend their commodities to worker at the campsite. Allow women traders to use the sanitary facilities available at campsites. 	Construction period	Roads Authority, Contractor, Balaka and Ntcheu Distracts Gender, Women and Child Welfare Offices	75,000.00
		<ul style="list-style-type: none"> Conduct regular maintenance of the road and its associated infrastructures 			

other associated infrastructures	Enhanced local community business	<ul style="list-style-type: none"> In addition to procurement of sand and quarry stone from large firms, encourage the local community to establish business group and supply these material correctively for minor construction activities 	Construction period	Contractor and Ministry of Trade and Industry	000.00
	Enhanced delivery of goods and services	<ul style="list-style-type: none"> Conduct regular maintenance of the road and its associated infrastructures 	Operation period	Roads Authority	As determine
	Improved scenical beauty from the constructed road	<ul style="list-style-type: none"> Construct shelters at bus bays to compliment the beauty of the new look road. Re-vegetate road sides especially with ornamentals plants in all strategic areas such as junctions. 	Construction period	Roads Authority and Contractor	350,000.00
	Increased foreign exchange from increased inflow of goods	<ul style="list-style-type: none"> Promote exportation of goods through the Nacala corridor through sensitisation of foreign investors. 	Operational period	Ministry of Trade and Industry	300,000.00
	Economic Growth	<ul style="list-style-type: none"> Ensure effective collection of tax and revenues Promote tourism and trade between Mangochi and other parts of the country 	Operation period	Malawi Revenue Authority and Ministry of Tourism	As determine
	Improved access to places of tourist	<ul style="list-style-type: none"> Ensure that the road is maintained 	Operational period	Malawi Revenue	As determine

	<p>attraction</p> <p>Improved safety for motorists</p> <p>Improved human health</p>	<p>regularly.</p> <ul style="list-style-type: none"> Ensure appropriate road alignment that comply with the RA standards Sensitize the people on the need to seek medical treatment at registered institutions when they are sick. 	<p>Construction period</p> <p>Operational period</p>	<p>District Health Committees for Balaka and Ntcheu</p>	<p>As determine</p> <p>110,000.00</p>
Negative Impacts					
<p>Increased soil erosion and sedimentation due to run-off and loosen soil surfaces</p> <p>Decline in water quality</p>	<ul style="list-style-type: none"> Construct channels for movement of run-off Erect contour bands Restrict construction to dry season Re-vegetate loosened soil surfaces Treatment of effluent/runoff/ leachate from waste disposal facilities Fencing of waste disposal facilities Installation of basic infrastructure at disposal sites Regular collection and disposal of wastes from project areas Maintain machines regularly to avoid oil spillages Dispose all rubble in recommended sites Maintain a vegetative buffer zone around mortal mixing points. Mix mortal 100m away from water resources 	<p>Construction period</p> <p>Construction period</p>	<p>Contractor and Roads Authority</p> <p>Contractor and Roads Authority</p>	<p>3,000,000.00</p> <p>5,000,000.00</p>	

	Disturbed natural hydrology	<ul style="list-style-type: none"> • Undertake excavations selectively to avoid places near rivers and streams 	Construction period	Contractor and Roads Authority	000.00
	Increase in generation of solid/hazardous waste	<ul style="list-style-type: none"> • Dispose all scrap metals at designated sites by the District and Town Assemblies. • Sell-out disused metal to welders 	Construction and decommission period	Contractor and District/Town Assemblies	450,000.00
	Poor air quality and Climate change due to dust emissions and fumes	<ul style="list-style-type: none"> • Sprinkle dusty surfaces with water. • Ensure that activities are undertaken using well serviced machinery 	Construction period	Contractor and Roads Authority	50,000,000.00
	Disturbance of habitats leading to loss of flora and fauna	<ul style="list-style-type: none"> • Restore the vegetation, rocks and soils of the disturbed habitats in order to create necessary conditions for the re-development of flora and fauna 	Construction period	Contractor and Roads Authority	350,000.00
	Potential immigration leading to competition for resources	<ul style="list-style-type: none"> • Promote other IGAs as alternative sources of livelihoods • Promote efficient use of different energy sources 	Construction period	Department of Energy Affairs, Ntcheu and Balaka Environment Sub-committees	230,000.00
	Increased noise and vibration from use of heavy machinery and	<ul style="list-style-type: none"> • Observe designated selected periods for conducting activities which produce a lot of noise. • Observe noise limit standards. • Use noise barriers like earth mounds 	Construction period	Contractor	250,000.00

blasting					
Disturbance of traffic flow	<ul style="list-style-type: none"> Construct detours and place appropriate signage. Train workers in traffic control skills and place them in appropriate positions. Segment the rehabilitation works at differentiated points to allow traffic to use the existing road while one part of the road is undergoing rehabilitation. Paint shiny surfaces with non-reflective colours Minimise dust emission by sprinkling soil surfaces with water 	Construction period	Contractor	6,000,000.00	
Visual intrusions	<ul style="list-style-type: none"> Paint shiny surfaces with non-reflective colours Minimise dust emission by sprinkling soil surfaces with water 	Construction period	Contractor	200,000.00	
Occupational health and safety risks	<ul style="list-style-type: none"> Ensure that PPE are provided and used by workers. Establish a Workplace Occupational Health and Safety programme 	Construction period	Contractor	1000000.00	
Cultural intrusion due to disturbance of graveyards, initiation camps and marriage break-ups from the rehabilitation works and settlement of	<ul style="list-style-type: none"> Avoid demolition of the grave yard. Avoid clearing initiation camp areas Conduct sensitisation of the surrounding communities on the social consequences of indulging in unacceptable sexual relationships 	Construction period	Contractor and District Social Welfare Committees and HIV/AIDS Advocacy NGOs	200,000.00	

	immigrant workers.					
	Poor sanitation arising from overcrowding at the campsite	<ul style="list-style-type: none"> • Provide waste disposal facilities such rubbish pits and toilets • Provide portable water • Conduct Health and Sanitation education to the campsite dwellers 	Construction period	Balaka District Assembly and Contractor	650,000.00	
c) Decommissioning and Operational Phase						
	Demolition of support infrastructures such as latrines and office blocks leading to Increased generation of waste from used out construction material and rubble	<ul style="list-style-type: none"> • Ensure that used out material and rubble are disposed at recommended sites by Balaka and Ntcheu District Assemblies 	Construction and operational period	Contractor and Balaka and Ntcheu District/Town Assembly	250,000.00	
	Increased potential road accidents at busy pedestrian crossing points	<ul style="list-style-type: none"> • Place speed limits. • Place Zebra –Crossing • Conduct road safety sensitisation to communities operating at these points 	Construction and operational period	National Road Safety Council	700,000.00	

Table 7.2: Environmental and Social Monitoring Plan for the Rehabilitation of Liwonde –Nsipe Road

Impact Identified	Indicator	Responsible Organization	Monitoring Frequency	Estimated Cost/Year (Mk)
Increase soil erosion and sedimentation due to run-off and loosen soil surfaces	<ul style="list-style-type: none"> Existence of constructed drainage channels for movement of run-off, Presence of contour bands Existence of re-vegetated sites 	Environmental Affairs and Department of Transport and Public Works	Quarterly	210,000.00
Decline in water quality	<ul style="list-style-type: none"> Suspended solids levels The existence of sensitive micro-aquatic organisms like tadpoles BOD levels 	Environmental Affairs and Department of Irrigation and Water Development	Quarterly	210,000.00
Disturbed natural hydrology	<ul style="list-style-type: none"> Absence of artificial hydrological trails 	Environmental Affairs and Department National Water Resources Board	Bi-annually	175,000.00
Increase in generation of solid/hazardous waste from scrap metal and rubble	<ul style="list-style-type: none"> Certification of solid waste disposal at designated sites by the Assemblies. Certified records of sell of scrap metals 	Environmental Affairs and Department Balaka and Ntcheu District Assemblies	Quarterly	210,000.00
Poor air quality and Climate change due to dust emissions and fumes	<ul style="list-style-type: none"> Dust free air space. Minimal dust traces on surfaces Certificate of adherence to air quality standards 	Environmental Affairs and Department of Meteorology and Climate Change	Quarterly	210,000.00
Disturbance of habitats leading to loss	<ul style="list-style-type: none"> Existence of rehabilitated habits 	Environmental Affairs		

of flora and fauna			Department of Herbarium and Biology National and Chancellor College	Bi-annually	175,000.00
Potential immigration leading to competition for resources	<ul style="list-style-type: none"> • A record and existence of IGAs • Proportional number of workers from the surrounding communities 		Environmental Affairs Department, Ministry of Labour and District Social Welfare Committees	Bi-annually	150,000.00
Increased noise and vibration from use of heavy machinery and blasting	<ul style="list-style-type: none"> • Presence of noise barriers • Existence of well serviced machinery 		Environmental Affairs Department and Polytechnic Engineering Department	Quarterly	250,000.00
Disturbance of traffic flow due to road blocks for paving way for road works.	<ul style="list-style-type: none"> • Trained traffic control workers • Presence of signage • Intermittent rehabilitation works on the existing road 		National Road Safety Council	Monthly	450,000.00
Visual intrusions	<ul style="list-style-type: none"> • Painted surfaces 		Environmental Affairs Department and Polytechnic Engineering Department	Quarterly	210,000.00
Occupational health and safety risks works	<ul style="list-style-type: none"> • The proportional number of people working in PPE • Existence of safety and healthy welfare committee 		Environmental Affairs Department and Ministry of Labour	Monthly	450,000.00
Poor sanitation arising from	<ul style="list-style-type: none"> • Existence of sanitation facilities 		Environmental Affairs	Monthly	450,000.00

overcrowding at the campsite	<ul style="list-style-type: none"> • Existence of Health and Sanitation Committee at the campsite • Clean surroundings • Reports on sanitation campaigns undertaken 	Department, Health and Environment Directorates.	0
Increased potential road accidents at busy pedestrian crossing points like schools, markets and churches due to speed of vehicles	<ul style="list-style-type: none"> • Presence of road safety signs at pedestrian crossing points • Presence of speed limit signs • Presence of Zebra Crossing 	Road Safety Council	175,000.00
Cultural intrusion due to disturbance of graveyards, initiation camps and marriage break-ups from the rehabilitation works and settlement of immigrant workers.	<ul style="list-style-type: none"> • Absence of disturbed cultural sites • Absence of complaints and conflicts with/ from the local community on such matters 	Environmental Affairs Department Balaka/Ntcheu District Assemblies	210,000.00

CHAPTER EIGHT: RECOMMENDATIONS AND CONCLUSION

8.1 Summary of positive impacts and enhancement measures

The study examined the scope of the proposed project and its associated impacts. It is therefore established that if implemented the project would contribute significantly towards the socio-economic growth of the nation and also the communities surrounding the project area. The study identified major positive impacts as follows: economic growth, employment opportunities, and improved human health through easy access to health facilities, improved access to tourism facilities and improved delivery of goods and services.

8.2 Summary of the Negative Impacts Recommended Mitigation Measures

Comprehensive suggestion to mitigate the said environmental impacts are presented in Chapter 6 and further detailed in table 8. Some of the selected mitigation recommendations for the main negative impacts are as follows:

a) Increased soil erosion and sedimentation due to run-off and loosen soil surfaces

- Construct channels for movement of run-off,
- Elect contour bands
- Restrict construction to dry season
- Re-vegetate loosened soil surfaces

b) Decline in water quality

- Regular collection and disposal of wastes from project areas
- Maintain machines regularly to avoid oil spillages
- Dispose all rubble in recommended sites
- Maintain a vegetative buffer zone around mortal mixing points.
- Mix mortal 100m away from water resources

c) Disturbed natural hydrology

- Undertake excavations selectively to avoid places near rivers and streams

d) Increase in generation of solid/hazardous waste

- Sell-out disused metal to welders
- Dispose all scrap metals at designated sites by the District and Town Assemblies.

e) Poor air quality and climate change due to dust emissions and fumes

- Sprinkle dusty surfaces with water
- Ensure that activities are undertaken using well serviced machinery

f) Disturbance of habitats leading to loss of flora and fauna

- Restore the vegetation and the rocks and soils of the disturbed habitats in order to create necessary conditions for the re-development of flora and fauna

g) Potential immigration leading to competition for resources

- Promote other IGAs as alternative sources of livelihoods
- Promote efficient use of different energy sources

h) Increased noise and vibration from use of heavy machinery and blasting

- Observe designated selected periods for conducting activities which produce a lot of noise.
- Use noise barriers like earth mounds

i) Disturbance of traffic flow

- Segment the rehabilitation works at differentiated points to allow traffic to use the existing road while one parties undergoing rehabilitation.
- Train workers in traffic control skills and place them in appropriate positions.
- Construct detours and place appropriate signage

j) Occupational health and safety risks works

- Ensure that PPE are provided and used by workers
- Establish an occupational health and safety programme

k) Cultural intrusion due to disturbance of graveyards and, initiation camps

- Avoid demolition of grave yards.
- Avoid clearing initiation camp areas
- Conduct sensitization of the surrounding communities on the social consequences of indulging in unacceptable sexual relationships

l) Poor sanitation arising from overcrowding at the campsite

- Provide waste disposal facilities such rubbish pits and toilets
- Provide portable water
- Conduct health and sanitation education to the campsite dwellers

8.3 Implementation Approaches on the Recommended Measures

The proponent of the project should liaise with the Environmental Affairs Department, Ntcheu and Balaka District Assemblies, Water Resources Board and traditional leaders in the project area in implementation the suggested measures for the main negative impacts. The proponent will have to liaise with appropriate authorities to obtain necessary licences for undertaking such activities like abstraction of water. The developer

should ensure that environmental legislations are followed.

8.4 Recommendations

- The Contractor should comply with legal obligations related to this project and should use the National Environmental Standards as a guide for emission limits. In absence of any emission limits in the national standards, the contractor should use other internationally acceptable standards for the limits.
- All displaced parties and other groups who will lose property should be fairly and promptly compensated.
- The Contractor should closely work with district and all relevant licensing authorities during the entire project implementation period
- The contractor should follow procedure for land acquisition and use for various purposes of the project
- The Contractor should fully rehabilitate campsites, borrow pits and road sides after project completion
- A comprehensive HIV/AIDS programme should be developed to facilitate sensitizations and training of workers and the general public
- Land that has been used for temporary works of the project should be returned to the rightful owners immediately after completion of the works.
- The contractor should prepare monthly progress reports on environmental and social management activities and submit to the RA and relevant Assemblies.
- The contractor should follow all the formalities related to development control and approval systems for this nature of projects.
- Stakeholder site meetings should regularly be organised by the RA in liaison with the contractor to discuss the implementation of the ESMP.
- It is recommended that the project should go ahead.

8.5 Conclusion

The rehabilitation of the Liwonde-Nsipe (M3/M8/M1) Road is an important project that has great benefits including facilitation of trade, education, health, reduction in travel times, improvement of income for the local communities through trade and employment. However, the EIA study has illustrated that the rehabilitation of the road will be realized at an environmental and social cost. The study showed that the environment and social contexts will be interfered with in varying magnitudes such as through erosion; loss of trees; disturbance to ecosystems; pollution of water, air and soils; loss of property and land; proliferation of communicable diseases and many other negative impacts. The study has therefore proposed several mitigation measures to control reduce or reverse the perceived impacts. It has also proposed implementation and monitoring mechanisms of the environmental and social management plan. Finally, recommendations have been made to guide the contractor on broader issues of environmental and social significance.

REFERENCES

1. Balaka District Assembly Socio-Economic Plan, 2009
2. Environmental Affairs Department, 2002, National Environmental Action Plan. Lilongwe
3. Environmental Affairs Department, 2002. National Guidelines for Environmental Impact Assessment in Malawi, Lilongwe
4. Malawi Government, 1969, Water Resources Act, Lilongwe
5. Malawi Government, 1991, Town and Country Planning Act, Lilongwe
6. Malawi Government, 1996, Environmental Management Act, Lilongwe
7. Malawi Government, 1997, Forestry Act, Lilongwe
8. Malawi Government, 2002, Malawi National Land Policy, Lilongwe
9. Malawi Government, 2004 , National Environmental Policy, Lilongwe
10. Malawi Government, 2008, Malawi Vulnerability Assessment Committee, Lilongwe
11. National Roads Authority, 2008, Environment and Social Management Guidelines in the Road Sector, Lilongwe
12. Ntcheu District Assembly Socio-Economic Plan, 2008
13. World Bank (1997), Roads and the Environment Handbook

ANNEX 1: TERMS OF REFERENCE

TERMS OF REFERENCE FOR THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE REHABILITATION OF LIWONDE-NSIPE (M3/M8/M1) ROAD

1. Provide a full description of the nature and location the project with respect to the name of the proponent, postal and physical address, the spatial location of the site of the project, the duration of project, estimate cost of the project, the project design, the activities to be undertaken, number of people to be employed, the size of the land of the project, scope and magnitude of the operation, resources requirement(raw materials, equipment), construction campsite, including water reticulation, waste disposal, design drawings and site plan of the same.
2. Provide a map of the area (scale 1:50,000) showing the proposed project site and a map showing existing establishments in the proposed area and surrounding areas (scale 1:10,000) with coordinates clearly indicated.
3. Describe existing biophysical, socio-economic and cultural conditions of the project including:
 - The scope of flora and fauna within the area;
 - Geological and soil condition of the area;
 - Existing land uses at and around the project site; and
 - Suitability of the site for the project.
4. State the reason for selecting the proposed project sites and any other alternatives considered.
5. Examine both the positive and negative environmental impacts as well as social, cultural and economic impacts. Attention must be given to the impact on the ecology of the area in which this project will be implemented.
6. Prescribe appropriate measures/strategies to eliminate, reduce, reverse or mitigate the identified negative impacts/effects identified including the measures to enhance the positive effects.
7. Prepare an Environmental Management Plan (EMP) in tabular form by which all of the mitigation/enhancement measures prescribed will be carried out, specifying who will be responsible for implementing these measures, the schedule for implementation and cost of implementing the measures. An environmental monitoring plan should also be prepared including the indicators to be used for monitoring the impacts and the responsible persons and institutions that will conduct the monitoring.
8. Undertake public consultations to ensure that all interested and affected parties are involved in the EIA process and incorporate their views into the EIA. Evidence of the consultation should be provided in the report.
9. Outline the relevant policy and legal framework pertaining to the programme and their implication on the programme. Reference should be made but not limited to Water Resources Act, Environment Management Act, Irrigation Act, Forestry Act, Fisheries Act and other relevant legislation.
10. Present the EIA following the Guidelines for the Environmental Impact Assessment in Malawi (1997).

ANNEX 3: SCANNED SIGNATURES OF SOME CONSULTED STAKEHOLDERS

BALAKA DISTRICT COUNCIL			
ATTENDANCE REGISTER FOR DEC MEETING OF 29/08/2012			
NAME	POSITION	E-MAIL	SIGNATURE
Lina Chingwala	Masaf 4 PO	lchingwala@d-f.gov.mw	
Sekani Tembo	BYC	sekanechukozatambo@gmail.com	
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Eugene Kamda	DHO	eugenekamda@yahoo.com	
Lively Kutengule Mwalu	Administrator	livelykutengule@gmail.com	

NTCHEU DISTRICT EXECUTIVE COMMITTEE



REGISTRATION FOR DEC MEETING.

DATE: 04/10/ 2018

NO	NAME	DESIGNATION	ORGANISATION	CONTACTS	EMAIL ADDRESS
	Ahijafe Chukakud	DCEO	NICE	0955272855	admic@calcutta.gov.in
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	F. Sadyantambe	DFO	Trade	0991516884	sadyantambe@yahoo.co.uk
	HMS ADI: MZEMIS	DIO	Immigration	0993866792	chulokabornzembel@yahoo.com
	Aubrey Palani	ADFO	FORESTRY	0999458220	aubrey.palani@yahoo.co.uk
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	Elizabeth H. Geza	S.L.O	LIZBAIL	0999221238	jezoffore@gmail.com
	Allan Kaila	DFO	FISH	0999284385	allan.kaila@gmail.com
	Bernadette Sibweya	STR	DC Planning	0999924606	

Telephone: +265 1 771111
Telefax No: +265 1 773379

Our Reference No: EAD/99/06/04.....
Your Reference No:

Communications should be addressed to:
The Director of Environmental Affairs



ENVIRONMENTAL AFFAIRS DEPARTMENT
LINGADZI HOUSE
CITY CENTRE
PRIVATE BAG 394
LILONGWE 3
MALAWI

26th November 2018

The Chief Executive Officer
Roads Authority
Private Bag B346
Lilongwe

Attn: Mr. A.C. Kaziputa (Environmental and Social Planner)

Dear Sir,

**CONFIRMATION ON THE VALIDITY OF NSIPE-LIWONDE-MANGOCHI
ENVIRONMENTAL IMPACT ASSESSMENT CERTIFICATE NUMBER 43A.2.4.3**

Your letter Ref No. RA/HQ/02/4 dated 28th November 2018 and bearing the above captioned subject matter refers.

Please get our confirmation that the Environmental Impact Assessment Certificate Number 43A.2.4.3 for Nsipe-Liwonde-Mangochi which was issued by this office in September, 2013 is valid until the completion of the said project. However, due to time lapse, in line with good environmental practices and principles of sustainable development, we wish to request that you share the update Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP) for the second phase of the project which begins from Liwonde to Msipe for monitoring purposes.

Your usual cooperation on such matters will be greatly appreciated.

Yours faithfully,

Michael Makonombera

FOR: DIRECTOR OF ENVIRONMENTAL AFFAIRS

MALAWI GOVERNMENT



NCE No 43A.2

EIA CERTIFICATE No.....43A.2.4.3

ENVIRONMENT MANAGEMENT ACT
(No. 23 OF 1996)

NOTICE OF APPROVAL TO
PROCEED WITH PROJECT

RE: CHIEF EXECUTIVE, ROADS AUTHORITY,..... P/BAG B. 3462 LILONGWE 3.....

WHEREAS the Minister has in terms of Section 24 (1) of the Environment Management Act specified by notice published in the Gazette, that is, Government Notice No . 58 of 1997, types and sizes of projects which shall not be implemented unless an environmental impact assessment is carried out,

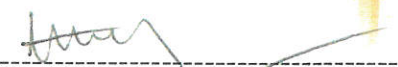
WHEREAS NSIPE - LIWONDE - MANGOCHI
is, pursuant to said Government Notice, of a type and/or size requiring environmental impact assessment prior to implementational;

WHEREAS ROADS AUTHORITY
has conducted an environmental impact assessment of the project and has submitted to the Director of Environmental Affairs, in respect of such assessment, an environmental impact assessment report; and

WHEREAS Section 26 (1) (d) of the Environmental Management Act provides that the Director of Environmental Affairs may recommend to the Minister approval of a project for which an environmental impact assessment has been carried out, subject to such conditions as of approval as he may deem appropriate,

NOW, THEREFORE TAKE NOTICE THAT NSIPE - LIWONDE - MANGOCHI

.....
Has been approved to proceed subject to the attached terms and conditions overleaf.

Recommended: 
.....
Director of Environmental Affairs

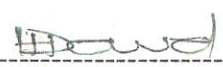
09/09/2013

Date

Concurred: 
.....
Chair, National Council for the Environment

12/09/2013

Date

Approved: 
.....
Minister Responsible for Environmental Affairs

12/09/2013

Date

Attachments (where appropriate)

