CONTRACTO Nº 781/DG/2010

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
for
N13 ROAD SECTIONS CONNECTING CUAMBA – MANDIMBA – NGAUMA – LICHINGA

FINAL REPORT 2012

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LIST OF ABBREVIATIONS AND ACRONYMS

AfDB	African development Bank
ANE	National Roads Administration
COI	Corridor of Impact
DNAIA	National Directorate of Environmental Impact Assessment
DPCA	Provincial Directorate for the coordination of environmental affairs
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ESIA	Environmental Social Impact Assessment
GoM	Government of the Republic of Mozambique
HHE	House Holds Headed by the Elderly
HHO	House Hold Headed by Orphans
JICA	Japanese International Cooperation Agency
M & E	Monitoring and Evaluation
MICOA	Ministry of Coordination of Environmental Affairs
NEMP	The National Environmental Management Programme
PAPs	Project Affected Persons
RAP	Resettlement Action Plan
ROW	Right of way
SATCC	Southern Africa Transport and Communications Commission
WB	World Bank

EXECUTIVE SUMMARY

The Government of Mozambique (GoM), acting through the national roads administration (ANE) is negotiating financing with the Japanese Government, for the improvement of transport infrastructure and for strengthening the institutional capacity of the roads sector. ANE plans to apply a portion of these funds to the environmental and social impact assessment (ESIA) of the project for the rehabilitation of the N13, Cumanba-Mandimba-Lichinga (302 km).

The road passes through many small towns and villages and is divided into three sections namely, Cuamba-Mandimba: 148 km (flat terrain), Mandimba-Lichinga148 km: (winding terrain, with some mountainous areas reaching about 1,400m in Lichinga) and Mandimba-Malawi Border: 6 km (winding terrain). The N13 is part of two corridors: Nacala –N13/N1 and Lichinga – N14/N1 providing a strategic link with the border of Malawi in Mandimba, the ports of Nacala and Pemba in the provinces of Nampula and Cabo Delgado respectively. The road also has the potential to contribute towards poverty reduction and stimulate the development of the country.

The road is in a reasonable state during the dry season but deteriorates during the rainy season due to poor drainage system and soil erosion. The width of the road varies between 5 and more than 10m and is usually lower than the surrounding terrain. The road is bumpy, with grooves and pot holes causing dangerous driving conditions and discomfort to passengers

AGEMA Consulting & Services Company Ltd. Was selected through public tender and hired by ANE to undertake the Environmental and Social Impact Assessment (ESIA) of the N13 Road rehabilitation project, which connects Cuamba-Mandimba-Lichinga including the section between Mandimba and the border with Malawi.

Process and Procedure

General

The road and intersections under investigation were visited over a period of two months following mobilisation. Visits were made intermittently until January 2011 to update data collected during our initial baseline studies, which included:

- desk study involving collection of basic documents and analyzing existing information on social and environmental concerns of the area of influence;
- assembling information from different sources, sociological, cultural, meteorological, hydrological, soils, topography, demographic etc.;

- holding public consultations regarding available sociological, biological and land-use information as well as community cultural interests;
- conducting field investigations.

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The desk study undertaken was a review of relevant literature including legislation, which governs development of ESIA in Mozambique, as well as the environmental and social policies, guidelines and procedures of the African Development Bank (AfDB), policies of the Japanese International Corporation Agency (JICA) and the World Bank (WB). Reports and literature from the following;

- the National Roads Administration (ANE),
- Ministry of Environmental Coordination (MICOA),
- Provincial offices of the following ministries: the environment; agriculture; planning, and public works.
- District administrations,
- Civil Society Organizations.

Consultations and information gathering were conduced with residents and other stakeholders in the locality of the project, in order to obtain a full understanding of community concerns and interests. A rapid appraisal technique using standard screening forms was employed

We have considered factors, which we believe are important in determining our approach to the study. These included:

- the scale of the project
- the location and sensitivity of the site
- the nature and magnitude of potential impacts.

Relevant issues were addressed in a manner, which provided a clear understanding of the actions and activities anticipated in the pursuance of the objectives of the project. Categories of influence within these have been listed covering, social, economic and ecological. The natural facets of each category have been addressed.

The socio-economic impact study took into consideration zones of high commercial influences (growth points) such as Mandimba and the border with Malawi. Zones of low commercial influence like Ngauma where the volume of business is lower were also considered.

Socio-Cultural Situation In Communities

Sample Size

A total of 77 household representatives from four (4) settlements in Lichinga district; two (2) in Ngauma district, seven (7) in Mandimba district and two (20 in Cuamba district were selected and interviewed ranging from five respondents to fourteen per settlement.

Rehabilitation of the project road is expected to produce some effect on the economic and social activity in the surrounding area including changes in the demands on health service and education

Data collection was carried to assess impacts which include the following:

1.1 Social Changes

The expected social consequences of the project are movement of people into the surrounding area with accompanying pressures on the health and education facilities.

(ii) Economic Changes

These are expected to take place as transportation improves access to previously isolated communities and towns.

(iii) Cultural Impact

A positive impact is expected as greater interaction is fostered between communities which will be brought closer together as long distances between settlements will no longer be an obstacle to movement of peoples

(iv) (iv) Road Safety

The increase of the population in the towns along the road may increase road accidents. It will require education and enforcement of traffic safety measures to minimize this impact. The road engineering safety measures has been taken into consideration in the design of the road, including road markings and traffic signs.

Data was collected as required, for the socio-cultural impact assessment in some of the communities in the vicinity of the project road.

The data were collected using questionnaires. Sample households in the communities were visited by trained field workers and heads of households, local leaders etc. were asked to provide answers to questions in the questionnaire provided.

Some of the relevant information obtained were:-

- Name of community
- Estimated number of houses
- Average household size
- Ethnic composition
- Access to health clinic
- Prevalence and types of common ailments
- access to education
- Service infrastructure available to the community
- Settlement linked with rehabilitated road by motor road
- Adequate transport service
- Road affecting cultural facilities
- Benefits/costs envisaged with newly rehabilitated road

In addition to the above, questions were also asked in order to assess poverty alleviation in accordance with the questionnaire provided.

The important details requested were as follows:-

- Name, age, sex of the interviewee
- Education
- Employment status
- Level of income/year
- Type of dwelling he/she lives in
- Any extra vocational/income generating activity
- How can development of a newly refurbished road increase opportunities
- for added income.

The study of settlements along the project road shows how improvement on the N13 road will have a positive impact on economic activities and overall development of settlements in the surrounding areas served by this road. Information on the resettlements are contained in a separate report, the RAP.

Project Description and Justification

The main components of the project include:

a) Asphalt paving and sealing of the N13 road sections connecting the Lichinga – Ngauma – Mandimba – Cuamba districts and the road section from Mandimba to the Malawi Boarder. The total length of road, proposed for improvement is 302km (presented in Table 1.1 and shown on Fig. 1.1 as road sections marked in red).

b) Improvement of road structures comprising of 14 bridges and box culverts

c) Construction of drainage; and

d) ancillary road works comprising installation of road signs, kilometer posts, guard rails; and road marking as well as grassing embankment slopes.

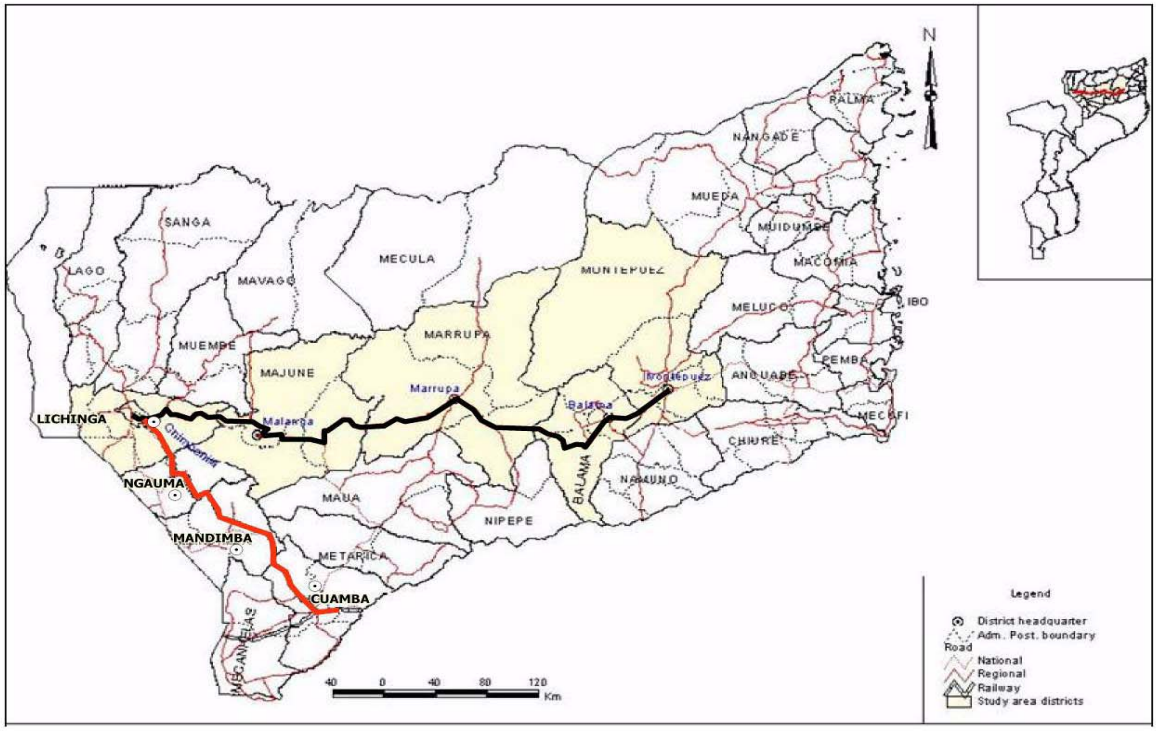

Figure1 Map showing the project road

Table 1 Road Sections and Total Road Length to be improved

District	**Cuamba**	**Mandimba**	**Ngauma**	**Lichinga**	
Road Length (km)	57	134	56	49	
Corridor	**Nacala**: Cuamba-Mandimba		**Pemba:** Lichinga – Mandimba		
Road length (km	148		148		
Total on N13 (Cuamba-Mandimba-Lichinga)					**296**
Mandimba – Malawi Border					**6**
TOTAL ROAD LENGTH					**302**

Policy, Legal and Administrative Framework

Mozambique's Constitution (2004) gives all citizens the right to live in a balanced environment and the duty to defend that environment (Article 90). The realization of this right goes through the proper management for the environment, its components and the creation of conditions conducive to the health, well-being, socio-economic and cultural development of communities and the conservation of natural resources that sustain them.

The state is obliged to☹i) to promote initiatives that ensure ecological balance, (ii) prevent pollution and integrate environmental concerns into all policies in the public sector(article. 117).

The National Environmental Policy,(1995) approved by Decree no.5/95aims to ensure an acceptable relationship between socioeconomic development and environmental protection for present and future generations. To meet these decrees the Environmental Framework Law- no.20/97was approved by Parliament with the purpose to define the legal basis for correct use of the environment and its components for the realization of a system of sustainable development in the country. This law applies to all public and private activities that may directly or indirectly influence environmental components.

One of the basic frameworks of the Environment Act is **the Environmental Impact Assessment (EIA)** for projects of economic and social development, which is regulated by Decree No.45/September 29, 2004, updated by Decree No.42/November 4, 2008.

The Decree is complemented by the General Directive for Environmental Impact Assessment (Diploma Ministerial129/2006) and the General Directive for Public Participation in the EIA process (Ministerial Diploma 130/2006).

The EIA regulations (Article 3) established three project categories to identify the level of environmental assessment to be undertaken.

(i) Category A: projects that cause significant impact due to the nature of the proposed activities or the sensitivity of the area, require a complete study, including an Environmental Management Plan (EMP);

(ii) Category B: Projects that have a negative impact of short duration, intensity, extent, magnitude and importance, require a Simplified Environmental Study (EAS);

(iii) Category C Projects which do not require environmental assessment, but must follow specific guidelines for good environmental management.

The Road Sector Decree,14/April 27, 1999 regulates the legal, institutional and financial support in which to operate the administration of roads

Resolution No.50/July 28, 1998, approves the National Policy and Road Strategy. It states that besides the positive impact on the development of the country in general and the well-being of people, activities related to roads should be developed in an attempt to mitigate the environmental damage the construction creates. The Government will continue to ensure that the environmental protection standards are followed when carrying out road work.
ANE submitted its draft to DNAIA, after the assessment the project was classified in category A and required a full EIA in order to reduce the negative environmental impacts.

Project Alternatives

The main alternative to the proposed project is the “without project” scenario.

Without the project, there will not be any new adverse environmental and social impacts since the current situation will remain as it is. However, economic growth will continue to stagnate due to problems of access to the potential agricultural development areas and due problems of transporting the necessary agricultural inputs to the communities.
With the project, there will be accelerated economic growth and the current environmental and social impacts would be mitigated through implementation of the environmental management plan.

The following three options were considered under the "with project" alternative:

1 - 30m COI as specified by the Mozambican land law
2 - 7m proposed by the design engineers
3 - 9m as suggested by the client ANE

The third option of 9m was selected and this was deemed to reduce the cost of resettlement and also guarantee road safety

Scope and Nature of the Project

The main objective of the Government is to develop and improve transport infrastructure in the Nacala corridor (Cuamba-Mandimba-Lichinga). The improvement of the road will comprise of sealing and applying asphalt on the N13, improving the 14 bridges and box culverts, construction of drainage, improving connecting roads, placing traffic signs, guard rails, speed limit signs and planting grass on the slopes. Other associated works include removal of corrugated pipes, removal and reinstallation of level crossings, demolition of existing concrete and transport of building materials.

The total estimated cost of the project is $ 125,297,100(One hundred and twenty-five million, two hundred and ninety-seven, thousand and one hundred US dollars) which will be applied in activities of scrub-removal work, construction of detours and auxiliary, bridges, culverts, drainage and other relevant work.

Justification of the Environmental & Social Impact Assessment

It is expected that the activities of the project will have positive and negative social and environmental impacts. Infrastructure and the operation of the project are susceptible to mismanagement and the environment's influence on the project.

The Environmental and Social impact Assessment (ESIA) started with a scoping report, approved by ANE, detailing the scope, extent and nature of the project. The report was prepared in accordance with the requirements laid down by the ministry for the coordination of environmental issues (MICOA). The final report was submitted to MICOA in December 2011. It was approved in March 2012 and authorized for application for the license.

Preparation of the ESIA Report

The preparation of this report by AIAS was based on field investigations, public consultations and interviews with the PI&As and representatives from key institutions. The approach included a review of relevant literature, reference to the relevant legislation, which governs development of ESIA in the country, as well as the policies of the African Development Bank's (AfDB) ESAP, the Japanese International Corporation Agency (JICA) and the World Bank (WB). The consultant's experience in similar work has played an important role in awarding them this project.

The total score of the severity of the global impact was comprised of factoring in the magnitude or extent, significance, likelihood and duration the impact would have on the project.

In resume, the study involved the following stages:

- Preliminary field visits
- Scoping exercise
- Review of Mozambican legislation and International guidelines
- Consultations held with local communities in the four target districts
- Gathering of data
- Assessment of potential environmental and socio-economic impacts
- Development of appropriate mitigation measures
- Development of an Environmental and Social Management Plan

Mitigation/Enhancement Measures

Based on a range of topics, the positive and negative environmental and social impacts were assessed for the construction and operation phases of the project. Measures are needed to maintain and increase the positive impacts and preventative actions taken for the anticipated adverse impacts.

Positive Impacts

The rehabilitation of the road Cuamba – Mandimba – Lichinga, including construction of the section of the road that leads to the border with Malawi, will facilitate the integration of Mozambique in the SADC region, specifically with the neighboring countries of Malawi and Zambia.

Rehabilitation of the road will also result in significant benefits within Niassa province in terms of access to social infrastructure (schools, health clinics and markets), as well as reducing travel time and costs within and between provinces thus improving the flow of agricultural products and other goods.

Indirect positive impacts associated with the rehabilitation of the road include, more investment in infrastructure programs by Government and NGOs, increased employment opportunities, improvement in the region's economy because of improved road condition agriculture will get a boost.

The positive impacts during the construction phase are related to employment opportunities and the consequent increase in the income of families, increased agricultural production and small businesses that serve employees of the contractor.

There will be significant direct and indirect positive socio-economic impacts, for the population living near the road and the districts traversed by the project. Public awareness and measures to employ as many local people as possible should be taken into consideration. Investors interested in developing infrastructure, industry, commerce and tourism should be made aware of the project as well.

Negative impacts

The current environmental impact of the existing road is minimal however; the project advocates increasing the width of the road which will consequently affect agricultural land, property and cemeteries that exist in the construction area. Therefore, a number of mitigation measures are proffered for the identified and potential impacts of the road rehabilitation project.

Mitigation could involve all or some of the following;

- Avoid the impacts by refraining from taking appropriate action
- Minimize impacts by limiting the degree of the action
- Failure to implement recommended action to be taken
- Rectify the impact by restoring the affected environment
- Compensate for the impact by replacing or providing compensation

To minimize the adverse effects associated with the construction of the road, the project will be designed based on the guidelines of the AfDB, JICA and World Bank on Involuntary Resettlement. With the assistance of the department responsible for land management within the district, communities affected by the project were consulted.
The other negative impacts associated with the improvement of the N13 include air pollution, contamination of water sources, soil erosion, noise and vibrations, loss of native vegetation, spread of diseases, increased road accidents and inclusion of women.

- Air quality pollution by dust and gas emissions can be minimized by regular maintenance of facilities and vehicles, as well as sprinkling water to suppress dust on dirt roads and surfaces during road work.
- All local vehicle maintenance, as well as storage areas for fuel and oil should be coated with concrete or other impervious material properly.
- Excavated areas should be compacted immediately after excavation to limit the exposure of loose soils, thus minimizing soil erosion.
- The use of appropriate noise mufflers and maintenance of vehicles and machinery will reduce the impact of noise and vibration associated with construction activities.
- Land clearing should be limited to only those areas necessary for the construction of the project.
- The conduct of employees in relation to health and safety, including the mandatory use of personal protective equipment at work as well as treatment of workers should be provided for all workers on the project.
- The placement of signals that regulate the speed at appropriate locations across the road will minimize the occurrence of road accidents
- The majority of women in the area can be engaged in clerical, food services, light work and supplies of essential commodities at sight. A smaller percentage could be deployed in some categories of machine operations.

Monitoring Program

The following environmental monitoring plan is recommended for implementation during the construction phase of the project:

- An Environmental Monitoring Unit (EMU) should be set up consisting of:
- The Resident Engineer –Chairman;
- The Contractor's Agent;
- ANE Representative;
- Representative of the MICOA in Niassa;
- One representative from each of the districts in the zone of influence of the project road.

The Unit should be charged with the responsibility of monitoring all environmental issues connected with the rehabilitation of the road and report directly to the Director General of ANE.

In particular, the unit should carry out the following duties:

(i) To ensure compliance with the Mitigation Plan (MP) as outlined in Appendix 1 and all legislation concerning environmental protection and improvement as well as the specific clauses relating to environmental matters included in the Contractor's contract;
(ii) To keep a register of compliance with the Plan for monthly inspection at EMU meetings including updating of the route plans showing tree planning, quarries and pits used with updated characteristics of each and location of erosion control devices in the drainage system;
(iii) To record any violation of the MP and action taken to correct them;
(iv) To identify any new environmentally harmful situations arising during construction and recommend measures for immediate mitigation;
(v) To carry out monthly physical inspection of the works to inspect environmental state of the works and any improvements implemented;
(vi) To prepare a monthly environmental report for presentation at monthly site meetings and submission to the Director of Projects at ANE and;
(vii) To make proposals for future maintenance studies. This will outline specific arrangements for studying subsequent maintenance subsequent to the completion of the works and should include tasks to be undertaken to improve the environment and comments or supplementary data regarding the state of quarries and the area drainage.

Environmental and Social Management Plan (ESMP)

Under the ESIA the ESMP presented a proposal of preventive and management measures for all the environmental and social impacts identified in the various phases of the project, including what entity(s) should be responsible for its/their implementation.

The EMP also proposed programs that define the procedures for monitoring the evolution of the aspects considered sensitive such as employment opportunities, loss of sacred sites and cemeteries, loss of land and /or property, loss and /or disturbance of natural habitats, noise and vibration, air quality, soils, water resources, social conflicts, waste, hygiene, health and safety at work.

Capabilities of Environmental and Social Units

The environmental and social unit (GAT) in ANE has been recently upgraded with training of personnel outside Mozambique. Staff from the unit also receive on-the job training through assignment to projects participation in all stages of project implementation especially in field data collection. However, considering that the language required for many donor funded projects is English, there is a language barrier between unit staff and consultants.

The technical staffs in the provincial ANE delegations are not adequately trained to monitor projects and this puts a strain on the few staff members in the unit who are usually absent in order to monitor projects.

Actions to strengthen capacities

Staff of the environmental and social unit should receive language training in order to facilitate communication with donors and consultants and also to get a better understanding of relevant documents and reports written in English.

Provide appropriate technical training for personnel in the provincial offices.

Cost Implications

Key Provisions to be included in the Works Specifications

The provisions described in this section are recommended for inclusion in the Specifications of Particular Application and should be paid for under identified bill items. Most of these relate to the Contractor's obligations and are to be paid as a lump sum. Other items to be paid on measurement of quantities should be measured as required on completed work.

The following clauses should be included under the indicated sections of the Works Specifications:

Section: Contractor's establishment on site and general obligations

Clauses on "Use and Storage of Materials" should cover protection of watercourses and groundwater from pollution.

They should include provisions, requiring among other things that the Contractor shall propose to the Engineer details of measures he proposes to adopt in order to reduce impacts on the environment of his worksites and facilities, and on the people living in the immediate vicinity. He should also be required to state his requirement as regards both the surface area to be used, the required bush clearing and any tree felling expected. He shall avoid trash and chemical waste dumping and ground water disruption or pollution of water table. The provision should require also that the worksite should be kept clean and litter free, with idle equipment properly secured in well-designated plant yard. He should limit the use of equipment, including bitumen plant and vehicles with high noise levels, or high emissions of air polluting gases; on avoiding the burning of wastes of any kind as a precaution against the outbreak of fires; and on the reduction of dust levels.

Section: Housing Offices and Laboratories for the Engineer's Site personnel

Include clause, which specifically requires that: Ablution and toilet facilities should be kept clean and regularly maintained, free from odour and of little risk to health and that there should be regular litter collection.

Section: Accommodation of Traffic

Clause on "Accommodation of Traffic" should specify that the Contractor is required to reduce disruption of the day-to-day activities of communities in establishing security and safety at diversions and at other worksites.

Section: Clearing and Grubbing

Clauses relating to Clearing and Grubbing and that for Disposal of Surplus Material, should require that spoil dumps should be isolated from normal working areas and from nearby settlements. They should not interrupt drainage or be susceptible to or increase the risk of erosion

Section: Drains

Clauses requiring temporary drains to be installed during construction should include standards for drainage to permanent and temporary housing to be used by the Contractor for staff accommodation to ensure that a storm water system is designed to handle the additional runoff expected. Guidelines should also be given for clearing of blocked culverts and side drains, and for reshaping of unlined open drains. The guidelines should require the Engineer to determine where the debris from culvert and ditch cleaning and drain reshaping should be placed, so that it is at a sufficient distance from the roadside if

placed upstream of the ditch or spread downstream with a counter-slope with respect to the ditch.

Section: Borrow Materials

The requirements for borrow materials should cover protection of trees, which should not be cut without approval of the Engineer, or destroyed during stock piling, drainage and finishing off or restoring the borrow areas to their original state on completion of the works.

Section: Landscaping and Grassing

The provisions under this section should include, qualifying clauses in respect of "Avoidance of invader species" during reinstatement and re-vegetation of quarry sites, borrow areas and campsites. The provision should also cover watering, cleaning and other tendering measures for planted trees and other approved plant species. Providing the planting material and maintaining the plants up to the end of the defect liability period, shall be covered for payment under a designated bill item.

Resettlement and/or Compensation Action

Upgrading the N13 Road will necessitate demolition of houses, kitchens, toilets, tobacco barns, kraals, yards, maize stores, water wells, chicken coop; and destruction of graveyards. Structures to replace the demolished ones will be re-constructed within the surrounding areas. There are no better alternative sites to avoid or minimize relocation of people. However, re-alignment of the new road, to avoid graveyards is highly recommended.

As a component of this study, a Resettlement Action Plan (RAP) was developed according to the Mozambican guidelines as well as policies and guidelines of the AfDB and JICA.

The RAP was prepared to ensure that construction of the road in built up areas will have minimum impacts on the Project Affected Persons (PAPs), their structures and livelihood through recommending fair compensation for land acquisition, relocation, loss of assets and impact on livelihood.

A total 2,639 persons in 531 household (includes PAPs with houses within the COI and those with other properties such as gardens exclusive of their houses.) will be affected by the road project. 531 households will be physically displaced and will be relocated to new sites outside the COI. The backyards of the houses in the COI are spacious and discussions with the PAPs and local leaders led to the agreement that people will shift demolished houses inwards behind the existing location. The displaced persons will require fair, adequate and timely compensation for their lost houses. .

793 structures will be affected. These include 531 houses, 51 kitchens, 141 shops, 29 maize stores, 24 toilets, 8 sheds and 9 other structures. Other affected properties include 1,850 fruit and plantation trees, 152 small gardens covering an area of 33.03 hectares, 75 yards covering an area of 52 hectares and 40 graves. It was noted from the field investigations that with the 9m COI there will not be any mass movement of graves. However, it is strongly advised that moving graves should be avoided by shifting the road from the side with the graves to the other side.

Conclusions and Recommendations

The rehabilitation of the road in Niassa province between Cuamba-Mandimba-Lichinga, including the road to the border with Malawi will certainly introduce significant benefits in terms of increased road traffic transporting goods and people throughout the year and facilitate the integration of the Republic of Mozambique in the SADC region, especially with its neighboring countries.

The road will also introduce significant benefits in terms of access to social infrastructure (schools, health clinics and markets) and reduce travel time and costs thus improving the flow of agricultural products and other goods.

Indirect Positive impacts associated with the rehabilitation of the road include: investments by the Government and NGOs in strengthening programs of infrastructure and improving the region's economy due to improved road circulation, increased employment opportunities, an increase in agricultural projects and agro-industries because of the excellent conditions for agricultural practices.

The project implementation will also have temporary positive impacts during the construction phase derived primarily from employment opportunities with the project that will result in increase in family income, increased agricultural production and small businesses that will benefit construction workers. There will also be positive direct and indirect socio-economic impacts for the population living near the N13.

The fact that project is rehabilitation of the existing road, there is minimal negative impact on its environment; however, this would change once construction begins to widen it to 18m. Currently the road crosses a large number of villages, with residential and commercial infrastructures that would be adversely affected by the project. The negative impacts include the destruction of homes and social infrastructures, agricultural land, vegetation on the roadsides.

Community Expectations of Social, Cultural and Economic Benefits from the Proposed Rehabilitation of the Road hinged on three significant benefits namely;

(i) Increase the volume of trade in the area, (ii) that business would be more brisk than at present inspective of volume and(iii) that transportation of goods will improve.

Some respondents stated safer roads, faster commuting, more job opportunities and cheaper travel costs.

To minimize the negative environmental effects of the project on these infrastructures, a Resettlement Action Plan (RAP) was developed according to the AfDB, the World Bank, JICA's and the MICOA guidelines on involuntary resettlement.

Based on the above, the following measures are recommended for total implementation to mitigate against negative impacts:

All impacts that require engineering and contract management solutions must be incorporated in the project design and specification for construction. The process of relocation and compensation should be administered through the offices of the District Administration and in such away that does not impair the performance of the project.

The relocation of cemeteries, as well as land acquisition, resettlement and compensation has been recommended in the RAP that was prepared for this project.

The costs of mitigation measures should be included in the construction tender documents.

The tender documents should also contain the appropriate conditions and clauses, including the recommendations of the ESIA and RAP to be followed and respected by all contractors. ANE and the consultant should adequately monitor the implementation of the ESMP and the RAP.

1 INTRODUCTION

The Program on Management and Maintenance of Roads and Bridges (ROADS-3) was designed to support the Road Sector Policy of the Mozambican government to improve the quality of the road network in the country. The National Administration of Roads (ANE) and the Road Fund (FE) began implementing a three phase program in 2001 that would last approximately10 years. This program is jointly funded by the Mozambican government and several donors, including the Japan International CooperationAgency, the Japan Bank for International Cooperation and the African Development Bank. The first phase of the program has lasted four years and is in the last stage of implementation.

The Mozambican government is negotiating with the Japanese government for the improvement of transport infrastructure, as well as strengthening the institutional capacity of the road sector. TheGovernment, through ANE, plans to apply a portion of these funds towards the Environmental and Social Impact Assessment (ESIA) of the rehabilitation project of the 302 km N13 national road (Mandimba-Cuamba–Lichinga).

The N13 is one of two corridors: Nacala and Lichinga N13/N1 and N14/N1 that provides a strategic link with the border of Malawi in Mandimba and the ports of Nacala and Pemba in Nampula and Cabo Delgado respectively. The road will stimulate development and contribute to the alleviation of poverty in the region.

AGEMA Consulting & Services Ltd. Was selected through a public tender and contracted by ANE to conduct the ESIA study for the rehabilitation project of the N13 road that connects Cuamba – Mandimba – Lichinga, including the road that borders Malawi in the province of Niassa

This is the report on the Environmental and Social Impact study conducted on the N 13, Cuamba-Mandimba-Lichinga. The report identifies the probable environmental and social impacts that the activity may have on the area and the corresponding positive and mitigation measures. As partof the study, an environmental and social management plan (EMP) was prepared containing instructions for environmental monitoring, definition of roles and responsibilities for implementing management actions and contingency plans for accidents. Also, a resettlement action plan (RAP) was developed and presented separately.

1.1 Purpose of the ESIA

The main objective of this Environmental and Social Impact Assessment is to minimize adverse effects on the biophysical and socioeconomic environments; during the planning, construction and operation phases of the project. The ESIA will facilitate integration of environmental concerns into the project cycle, to ensure sound and sustainable project implementation. It provides a window for community and stakeholder participation in identification of environmental and social impacts, as well as mitigation measure for the negative impacts of the project. It also ensures that the concerns and suggestion of the affected communities and other key stakeholders have been taken into consideration in the implementation of the project.

1.2 Overview of the Project

The proposed road project is 302 km long (Cuamba–Mandimba: 148km; Mandimba-Lichinga: 148km, Mandimba town-Malawi Border: 6km). The proposed project will involve asphalt paving and sealing of the road. The project will also involve improvement of road structures comprising of 14 bridges and box culverts; construction of drainage and ancillary road works comprising of road signs, kilometre posts and guard rails; and road marking as well as grassing embankment slopes. Other associated works include removal of corrugated pipes, removal and re-installation of railway level crossings, demolition of existing concrete, construction of temporary diversions and sourcing and transportation of construction materials. Table 1 shows the road sections and total road length to be improved.

1.3 Purpose and Needs

The Government of Mozambique will rehabilitate the N13 road (Cuamba-Mandimba-Lichinga) in Niassa province as well as the section of the road up to the border with Malawi in Mandimba district in order to improve access and movement of people and goods and ensure constant flow of traffic throughout the year.

The section of the N13 project is part of the Nacala corridor in Niassa province providing a strategic link with the border with Malawi, the ports of Nacala and Pemba in Nampula and Cabo Delgado provinces respectively. The road has the potential to stimulate development and help reduce poverty in the surrounding areas.

1.4 Identification of The Project's Proponents

Project Sponsor.

The National Roads Administration (Administração Nacional de Estradas) is the national authority, charged with the responsibility for development and maintenance of national roads in Mozambique.

The contact details are as follows:

The Director for National Roads
Av. De Mocambique, 1225,
Maputo, MOCAMBIQUE
Tel. (258-21)476262/7
Fax (258-21) 475862

The Team Responsible For The Study

AGEMA Consulting & Services Ltd. was contracted by ANE to conduct the ESIA. The Consultant's contact is as follows:

AGEMA Consultoria& Services Ltd.

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Maputo, Moçambique
Tel. +258 21 303353
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The Consultant's team consisted of the following key technical experts

Name	Position	Duties
Verona Parkinson	Project Director	Project management and Logistics Quality control Training Coordination of reports
Kent Kafatia	Environmental and Resettlement Specialist	Coordination of technical team Data collection, analysis & Interpretation Training Reporting
Eulália Macome	Consultant	Public Consultations
Pita Sitoe	Ecologist	Field research Data collection and analysis Reporting
Armando Tovela	Socio-Economist	Field research Data collection and analysis Reporting Public consultation
Alda Salomão	Legal Specialist	Review and Analyze the legal aspects of the study

1.5 Organization of the ESIA Report

Executive Summary

Chapter One: Introduction: Outlines the purpose of the ESIA, presents an overview of the proposed project to be assessed, the project's purpose and needs. The chapter also identifies the project proponent, the contents of the ESIA Report and the methods adopted to conduct the study.

Chapter Two: Review of Policies, Procedures and Legislation Relevant to the Project provides an outline of the Mozambican's policies, procedures and legislation which govern preparation of the ESIA. Also included in this chapter are the World Bank Policies relevant to involuntary resettlement.

Chapter Three: Project Description and Justification
The chapter gives the objectives, justification, approach and methodology for the ESIA study. The chapter also describes the proposed project and its geographic, ecological, social, economic and temporal context: project location, various project components, capacity, construction activities.

The project justification and description of the Biophysical and Socio-Economic Environment of the project area. Biophysical aspects include the topography, soils, climate and rainfall, water resources, flora and fauna. Socio economic aspects, demography and settlements, land administration, economic activity, infrastructure, water supply, health and HIV and AIDS prevalence. The information in this chapter provides the baseline for predicting the environmental and social changes or impacts.

Chapter Four:. Description of the Project Environment

This chapter gives a description and analysis of the physical, biological and human conditions relevant to the environmental and social issues within the project area.

Chapter Five: Project Alternatives

The alternatives of the project, including the "without project" option is presented.

Identification and Assessment of Impacts outlines the approach and methodology for impact identification. It provides information on affected environmental components according to the project phases and proposed project activities. The chapter also covers impact prediction and determination of mitigation measures.

Chapter Six: Potential Impacts and Mitigation/Enhancement Measures

The methodology of assessment presented. The chapter presents a detailed analysis of beneficial and adverse impacts of various components of the selected project alternative on the physical, biological and human (social, cultural and economic) environments. Then all environmental and social, direct and indirect, short and long-term, temporary and permanent impacts are described and assessed, indicating their importance level and

Appropriate mitigation measures to prevent, minimise, mitigate or compensate for adverse environmental and/or social impacts.

The estimated cost of the measures is also presented.

Environmental and Social Management and Monitoring Plans: covers impact evaluation using a matrix with the attributes of magnitude, significance, probability of impact occurrence and duration of impact. The chapter introduces the process for impact scoring and provides a matrix for the evaluated and scored impacts. It presents a tabulated Environmental Management Plan (EMP) for managing the impacts and an Environmental and Social Monitoring Plan for effective implementation of the impact enhancement and mitigation measures.

Environmental and Social Monitoring Program

The first section of this chapter shall describe the surveillance measures aiming at ensuring that the proposed mitigation and enhancement measures are effectively implemented during the implementation phase. The second section concerns the environmental and social monitoring activities designed to measure and evaluate the project impacts on some key environmental and social components of concern and to implement remedial measures, if necessary. Indicators, roles and responsibilities shall be clearly defined. The cost of the program shall be estimated, including the cost for environmental and social capacity building if necessary.

Chapter Seven: Public Consultations
This chapter summarises the actions undertaken to consult the groups affected by the project, as well as other concerned key stakeholders including Civil Society Organisations.

Chapter Eight: Conclusion and Recommendations highlights the conclusions of the report, based on the major findings of the ESIA study and the major positive and negative impacts of the propose project. The Chapter also outlines the recommendations to be taken into account during project implementation

Chapter Nine. Annexes

1.6 Methodology

The process of evaluating the environmental and social impact followed the guidelines for roads in Mozambique (1997, the applicable documents that are the guidelines for the road sector). To prepare the ToRs and carry out the preliminary activities, the ESIA study was prepared with the cooperation of the team responsible for conducting the feasibility study for the project, the team responsible for improving the final design of the N13, the ANE- GAT unit and the ANE delegation in Niassa province.

1.6.1 Preliminary Discussions and Literature Consulted

The following institutions **were considered by the consultant for preliminary discussions and literature**:

- The client (ANE) was consulted to confirm the objectives of the project, the study area and the necessary documents of the project that would be needed for the study.

- A meeting was held with the Environmental Officer of the Millennium Challenge Account. The purpose of the meeting was to request any relevant literature and discuss their experiences about the process of resettlement and compensation in projects financed by donors.

- A meeting with the national director environmental impact assessment in MICOA to discuss the requirements and procedures for conducting environmental impact assessments and social development in Mozambique and collect relevant documents on current legislation.

- A meeting with the national director of resettlement issues in MICOA

- A meeting with the Director General of the National Roads Authority. The meeting focused on the modalities and implementation phases of the Roads-3 projects.

- A meeting with The Head of Property Assessment in Niassa Province to discuss procedures and methods for assessing property and the collection of relevant information.
- A meeting with the ANE delegation in Niassa Province to discuss the implementation of the project locally; to obtain additional documents such as maps of the area; issues pertaining to information regarding the right hand lane, properties that may be affected (including cemeteries) and the collaboration of the delegation in future research and evaluation of properties.

1.6.2 Preliminary Groundwork Investigations

The main purpose of the preliminary investigations on the ground was to have an over view of the project area, existing infrastructure, socio-economic activities and to facilitate the preparation of the terms of reference for the detailed study for ESIA.

Interviews conducted at random with road users; community leaders and families living along the N13 focused on the following:

- Use of land along the road
- Type of infrastructures that would beaffected
- Existing road conditions (width, type of drainage, materials used etc.)
- Ecological conditions along the road
- Type of crops grown along the road
- Type of socio-economic activities (eg, small shops, markets and gardens)

- Perceived impact of the rehabilitation project

The names of major rivers along the route were investigated, the location of existing bridges were confirmed using GPS (Fig. 2.2) and their current state, as well as the problem of erosion observed along the river banks near the bridges.

Fig. 2.1 Interview of Local traders on the road side

Fig. 2.2 GPS Recording of Bridge Coordenates

2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 Mozambique Policies and Legislation

2.1.1 Background on Legislation and Environmental Regulations

Mozambique's Constitution gives all citizens the right to live in a balanced environment and the duty to defend that environment (Article 90). The realization of this right goes through the proper management for the environment, its components and the creation of conditions conducive to the health, well-being, socio-economic and cultural development of communities and the conservation of natural resources that sustain them.

The state is obliged to:(i) promote initiatives that ensure ecological balance, (ii) prevent pollution and integrate environmental concerns into all policies in the public sector(art. 117).

The National Environmental Policy, approved by Decree no.5 / 95aims to ensure an acceptable relationship between socio-economic development and environmental protection for present and future generations. To meet these decrees, the Environmental Framework Law- no.20/97was approved by Parliament. The purpose of this law is to define the legal basis for correct use and management of the environment and its components for the realization of a system of sustainable development in the country. This law applies to all public and private activities that may directly or indirectly influence environmental components.

Institutional Framework

One of the basic frameworks of the Environment Act is the Environmental Impact Assessment for projects of economic and social development, which is regulated by Decree No.45/September 29, 2004, updated by Decree No.42/November 4, 2008.

The EIA is an instrument that supports the Government of Mozambique in decision making and allocation of environmental permits for development projects. The authority responsible for environmental licensing of the different activities is the Ministry for Coordination of Environmental Action (MICOA), through the National Directorate of Environmental Impact Assessment (DNAIA). DNAIA has as one of the main functions of ensuring compliance with regulations on the EIA. At the provincial level is the Provincial Directorate (DPCA) where initially the project's input is given for pre-assessment. However, projects classified in category A are submitted to MICOA, and category "B" falls under the responsibility of DPCA for implementation and monitoring

The Decree is complemented by the General Directive for EIA (DiplomaMinisterial129/2006) and the General Directive for Public Participation in the EIA process (Ministerial Diploma 130/2006).

The Process of Environmental Impact Assessment is governed by Decree No. 45/2004, while the Environmental Audit and Environmental Inspection are guided respectively by Decree No. 32/2003 and No. 11/2006.

The EIA Regulations (Decree No. 45/2004 of 29 September) establishes the EIA process, defining the level of environmental assessment required for each project category, the content of the environmental studies, the review process and environmental licensing. This Regulation is complemented by the Directive General of Environmental Impact Assessment detailing the contents of the EIA Directive and the general process for public participation in EIA.

According to the Regulation on the Environmental Audit Process (Decree No. 32/2003 of August 20) any public or private business may be subject to public environmental audits (conducted by MICOA) or private (internal). The audited entity should provide the auditors free access to the sites to be audited, as well as all the information requested.

Additionally, through the Regulation on Environmental Inspection (Decree No.11/2006 of 15 July) there are legal mechanisms for regulated inspection of public and private activities, which directly or indirectly are likely to cause negative environmental impacts. This aims to regulate the activity of supervision, control and supervision of compliance with environmental protection standards at the national level.

Projects are classified into three categories namely:

(i) Category A: projects that cause significant impact due to activities or sensitive areas, require a complete study, including an Environmental Management Plan (EMP);

(ii) Category B: Projects that have a negative impact of short duration, intensity, extent, magnitude and importance, require a Simplified Environmental Study (EAS);

(iii) Category C: Projects which do not require environmental assessment, but must follow specific guidelines for good environmental management.

The Road Sector Decree, 14/April 27, 1999 regulates the legal, institutional and financial support in which to operate the administration of roads with the following objectives:

- To ensure the development, balance, unity and harmony of national road network.

- Promote the integration, participation and training of public and private stakeholders in the planning, development, financing and management of roads.

- Establish an institutional framework conducive to increasing effectiveness and efficiency in dealing with issues relating to roads

- Establish a legal framework to ensure the continued funding and regular maintenance and management of roads.

Resolution No.50/July 28, 1998, approves the National Policy and Road Strategy. It states that besides the positive impact on the development of the country in general and the well-being of people, activities related to roads should be developed in an attempt to mitigate the environmental damage the construction creates. The Government will continue to ensure that the environmental protection standards are followed when carrying out road work. There should be specifications regarding this in the tender documents on their plans to execute road work.

ANE submitted a draft of the N13 project to DNAIA for assessment for classification. The project was classified in category A and was expected to undertake a full ESIA in order to reduce the negative environmental impacts.

2.1.2 Regulations relevant to Roads Projects

The rehabilitation project of the N13 is covered by the Regulation on Environmental Quality Standards and Effluent Emission (Decree no.18/ June 2, 2004**).** The regulation applies to all activities that directly or indirectly interfere with environmental components (**Article** 3).

Article 7 lays out the parameters for the maintenance of air quality so that the project maintains its quality of self-cleaning and has no significant adverse impact to public health and ecological balance.

Article 9 sets emission limits, values of air pollutants from mobile sources or motor vehicles.

Article16 sets out the standards to be observed for the discharge of domestic waste-water in the affected environment, including marine, there fore creating no change in water quality. The need to adjustment to lower values depends on the sensitivity and use of the affected environment, particularly when it consists of lakes, reservoirs or bays with low water renewal or its tributaries.

Article19of Decree no.18/2004, shall also determine compliance regarding legally acceptable limits for deposit of harmful substances in the soil, as well as to engage in activities that involve movement of soil without proper conservation measures that may hinder or contribute to degradation.

The noise levels acceptable to the health and safety of the public peace are established according to the emission source of noise as referred to by Article 20.
Finally, Article 24 of Decree no.18/June 2, 2004, sets out the conditions and penalties that apply in the case of non-compliance of this law in the country.

2.1.3 The National Environmental Management Program (1995)

The National Environmental Management Programme (NEMP) seeks to promote and implement sound environmental policy. The NEMP was formulated by the ministry responsible for environmental coordination (MICOA) as a master plan for environment management in Mozambique. It contains the National Environmental Policy, a proposal for Framework Environmental Legislation and the Environmental Strategy. The NEMP consists of Sectoral Plans, which are intended to guide sustainable development for the medium and long term. The policy areas are classified as the rural, coastal and urban areas. For the rural areas, agriculture and forestry issues are considered the most important. In coastal areas, mangrove degradation, coastal pollution and erosion are the main issues to be addressed and for the urban areas, the degradation of sanitation systems and poor water quality are the most prominent issues. MICOA has the mandate to oversee the implementation of the NEMP through which environmental rules and regulations are being devised and enforced.

MICOA in coordination with other ministries works towards the:
Development of inter-sectoral policies for sustainable development - including roads projects

- Development and promotion of integrated resource use planning
- Promotion of sectoral legislation and establishment of norms and criteria for environmental protection and sustainable use of the country's natural resources
- Creation of an enabling environment for law enforcement and environmental monitoring

2.1.4 The Framework Environmental Law (1997)

The Framework Environmental Law acknowledges the responsibility of the Government of Mozambique in the promotion and implementation of the NEMP. The Law provides the legal framework for the use and sustainable management of the environment and its components. The Environmental Law is applicable to all public and private activities that

directly or indirectly affect the environment. The law forbids all activities that threaten conservation, reproduction, biological resources (especially endangered and prone to extinction); seeks to protect environmental components with recognised ecological and socioeconomic values by way of creating protected zones at the national, regional, or local level. These areas include rivers, lakes, marine waters and other fragile natural zones. Licensing for activities that are liable to cause significant environmental damage, depending on the level and significance of impact is required. Among other things, the law (Article 4) states that any citizen who believes his rights have been violated or are under threat of violation may take legal action against the perpetrator. Violation of rights includes personal loss and injury; and the loss of crops and profits. The framework environmental law paved way for the establishment of the national Comission for Sustainable development (NCSD) in October 2000, to ensure high level and effective coordination and integration of sectoral environmental policies.

As per article 8 of the Environmental law , the government of Mozambique is required to create adequate mechanisms for public participation in environmental management , from the drafting of environmental policies and legislation to their implementation.

Article 9 of the same law prescribes the production and deposit of any toxic and polluting substances in the nation's soils, sub-soils, water or the atmosphere and prohibits the undertaking of activities likely to accelerate erosion, desertification or any other form of environmental degradation beyond the legally established limits.

2.1.5 EIA Regulations and E IA Directives (1998)

EIA Regulations and EIA Directives provide the framework for the responsibility and conduct of Environmental Impact Assessment for various infrastructure projects. The regulations provide for the process of conducting EIA's and highlight the importance of the public consultation process in carrying out EIA studies and in development of environmental management plans. MICOA is mandated by the regulations, to call for public hearings whenever the scale of environmental degradation by a project is high and when requested by the affected parties whether public or private. An appendix to the EIA regulations lists the activities relevant to the roads sector that may cause significant impacts on the environment. These, among others include plans, programmes and projects that may affect sensitive areas directly, or indirectly; and those that imply the permanent or temporary displacement of populations and communities.

2.2 Complementary Legislation applicable to Roads Projects for Sustainable Management of the Environment

2.2.1 The Land Law (1997)

The new Land Law legislation No. 19/97 covers regulation for the key aspects of land occupation and use in Mozambique. Also covered in the regulation are the various situations of land acquisition, including among others:

(a) the acquisition of the right of land use and benefit through the official channels;
(b) the rules governing protection zones;
(c) the relationship between the public and the Cadastre Services; and
(d) the rights and duties of the title holders

Article 3, of the Land Law stipulates that in the Republic of Mozambique, land is the property of the State. The Law states however, that although land is owned by the State, all Mozambicans have the right to use and enjoy the land or the right to land use and benefits thereto. Specifically, Article 9 provides for the acquisition of the right of land use and benefit by occupancy by local communities; while Article 10 provides for the right of land use and benefit by occupancy in good faith by national individuals.

Article 23 empowers District Administrators, where there are no Municipal or Settlement Councils, to authorize applications for land use and benefit. The Land Law Legislation captures and observes internationally innovative features that facilitate equitable development, based on relations that are mutually beneficial to local communities and to investors whether these are national or foreign.

The New Land Policy (1995)

The New Land Policy was approved by the Council of Ministers in October 1995. The main elements of this new policy are that it recognizes customary rights over land, including the various inheritance systems; it recognizes the role of the local community leaders in the prevention and resolution of conflicts; it aims at creating conditions for the development and growth of the local community and the promotion of investment by the commercial sector; and that it maintains the concept of land belonging to the state.

Resettlement

Regulation of the Land Law 66/1998 recommends compensation for losses resulting from relocation. Basic guidelines are provided for compensation in the form of tables, produced and updated by the Provincial Directorate of Agriculture, and provides current values and market production of several annual crops and trees. All Mozambican guidelines emphasize the importance of involving local authorities of districts and others in the

resettlement process, to ensure that it is appropriate to local circumstances, and so that the government staff can learn and apply procedures similar to other resettlement projects in that territory.

In 2000, MICOA produced guidelines on criteria titled, "The Resettlement of Populations in Rural Areas", these guidelines were aimed at facilitating the resettlement process after the floods. Based on this, In June2007, the National Roads Administration published a draft titled "The Resettlement Policy Framework for the Road Sector", where the steps and the process of resettlement and compensation are defined.

2.2.2 Legislation on Water Resources and Water Quality

The management of water resources is defined by the water policy, Decree46/2007, and the Water Act16/91. This new policy includes important issues such as water management of river basins, development of new water infrastructure and integrated management of water resources with the participation of stakeholders as well as improving sanitation in urban, peri-urban and rural areas.

As per Article 18 of the water Law, the Regional water Administration bodies (ARAs) are the institutions responsible for managing the water resources comprised in the river basins for which they are regionally responsible. The influence zone of the Project is under the jurisdiction of ARA-Norte.

The Water Law defines the basis for water resources management, the "user pays" and "polluter pays" principles and the regime governing water use concession and licenses. These factors are defined based on environmental sustainability principles.

Article 54 of the Water law, foresees the enactment of a regulation on effluent quality standards for receiving water bodies, treatment technologies, systems and methods. This regulation is also foreseen in the Environmental Law.

The emission Standards Regulations govern certain water quality standards, namely for agricultural use and recreational purposes, as well as emission standards for industrial and domestic effluent.

The water standards for human consumption are contained in the regulations on Water Quality for Human Consumption, approved by Ministerial Statute No. 180/2004, of 15 September 2004. These Regulations are applicable to potable water supply systems for human consumption, including surface and ground water used for direct consumption or

for the production of water for human consumption. The Ministry of Health is the authority responsible for ensuring quality control of water for human consumption.

2.2.3 Solid Waste Management

Waste Management Regulation: Decree 13/2006 establishes parameters for maintenance of soil quality, recommending soil conservation practices (Article 18). The regulation prohibits the disposal of polluting substances on soils (except in areas legally approved for such disposal); carrying out activities which lead to soils disturbances that may result in or contribute to the degradation of soils, without undertaking appropriate measures for soil conservation (Article 19)

Article 33 of the Environmental Law 20/97 classifies hazardous waste and non-hazardous waste to include dangerous explosives and liquefied gases; and Article 204 of the Constitution includes domestic and commercial solid waste, demolition debris, garden waste and industrial solid waste.

At the moment, existing legislation governing solid waste management is limited to medical waste. MICOA is currently developing general solid waste management regulations. These regulations will be applicable to waste water, hazardous waste which will be subject to specific regulations.

2.2.4 Atmospheric Emissions

Article 9.1 of the Environment Law prohibits the release of any polluting and toxic substances in the atmosphere beyond the legally established limits. The emission standards regulations define the pollutants threshold parameters as well as core parameters which characterize air quality.

With regards to mobile emission sources, the regulation defines maximum emissions for the different categories of vehicles based on fuel consumption.
The regulations do not define the emissions limit for lead (Pb) even though most vehicles in Mozambique still use leaded fuel.

Article 22 of the emissions standards regulations provides for the possibility of extraordinary pollutant emissions to the environment as a result of system failure or any other unforeseen circumstance and requires a special authorization to be issued by MICOA for said purpose as well as the payment of a fee determined in accordance with circumstances detailed in Article 23.

With regards to noise, Article 20 of the emissions standards regulations establishes that noise emission standards shall be approved by MICOA. The same Article envisages that noise emission standards will take into account the emission sources.

2.2.5 The Forestry and Wildlife Law

The Law of Forestry and Wildlife; 10/1999: sets the rules about the use of forest resources and wildlife. Article 10 defines the areas of biodiversity, fragile ecosystems, plant and animal species to be conserved. The country has a list of animals on the endangered species list and the levels of protection that each requires.

2.2.6 The Planning Law (No.19/2007)

This law is to regulate land use planning and establish a system of territorial management. " The aim is to ensure the organization of national space and sustainable use of natural resources, noting the legal, administrative, cultural and material that is conducive to social and economic development of the country. Promoting the quality of life, the protection and conservation of the environment ".This law applies at national, provincial, district and local government levels, it requires the preparation of plans that suit the reality of each level.

2.2.7 The Urban Construction Legislation (Decree No. 2/2004)

The urban construction legislation (Decree No. 2/2004) states that demolition and repositioning of structures as a result of construction activities may take place when there is public interest. The demolition may be total or part of the structure. However, before demolition or repositioning takes place, it is necessary to hear the affected persons. Only after consultation may the household be transferred to a new place.

2.2.8 The National Heritage Protection Law (1988)

The National Heritage Protection Law No. 10/88 is intended to protect all national antiques, historical and cultural heritage defined as "group of material and non-material goods created or integrated by the Mozambican people throughout history, with relevance to Mozambican identity." Materials include: monuments, groups of buildings with historical significance, artistic or scientific workplaces or sites (such as archaeological, historical, aesthetic, ethnological or anthropological interest) and natural (physical and biological formations, with particular interest from an aesthetic or scientific point of view). It is a requirement under this law that such protected areas are to be avoided in the selection of project sites The proposed N13 road project passes through some local sacred sites such as graveyards which will need to be protected by this law.

2.2.9 National Roads Administration (ANE) Environmental Guidelines for Road Works in Mozambique (Draft 2006)

The overall purpose of the ANE guidelines is to develop procedures for the effective environmental planning and management of road projects and their operations. ANE's guidelines are in line with the national legislation and complement the existing EIA procedures in the development of ESIAs for the road sector.

The guidelines provide examples of data needed for each chapter of the ESIA.

Public Participation and Consultation

The guidelines recommend that whenever the road works result in adverse effect on the people living along the road, that data about the present situation regarding population, land use, natural resource use and cultural, historical sites and heritage is collected. Also that information regarding resettlement such as identifying project affected people,, their assets and community assets must be recorded.

Environmental impact of roads and mitigation measures.

The guidelines provide recommendations on how to conduct the environmental and social analysis of the different components of a roads project providing best practices.

2.3 International Policies

At the international level, Mozambique has signed and ratified various treaties and conventions that contribute to environmental management and conservation of natural resources. These will be taken into account in assessing the impacts and proposed mitigation, and the preparation of the Resettlement Plan and Environmental Management Plan.

2.3.1 Relevant World Bank Safeguard Policies

Considering that MICOA's guidelines as well as JICA's requirements for the EIA report for category A projects are based on the World Bank's (WB) relevant WB policies are presented.

The proposed improvement of Mozambique N13 Road will trigger two of the World Bank's safeguard policies. Operation Policy (OP) 4.01 Environmental Assessment and OP 4.12 Involuntary Resettlement are the most relevant and applicable safeguard policies for this project.

Environmental Assessment (Operational Policy 4.01)

The objective of OP 4.01 is to ensure that World Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and mitigation of their likely environmental impacts. This policy is triggered if a project is likely to have potential adverse environmental risks and impacts in its area of influence. Construction of the N13 Road will have environmental impacts, which require mitigation. Therefore, preparation of this ESIA document is in line with this Operational Policy.

Involuntary Resettlement (Operational Policy 4.12)

The objective of OP 4.12 is to avoid or minimize involuntary resettlement where feasible by exploring all viable alternative project designs. OP 4.12 is intended to assist displaced persons in maintaining or improving their living standards. It encourages community participation in planning and implementing resettlement; and in providing assistance to affected people, regardless of the legality of title of the land they posses and has to be acquired for project activities. This policy is triggered not only if physical relocation occurs, but also by any loss of land resulting in:

a) relocation or loss of shelter;
b) loss of assets or access to assets; and
c) Loss of income sources or means of livelihood, whether or not the affected people must move to another location.

2.4 International Guidelines

The following were the most important international guidelines consulted for this study.

2.4.1 JICA's Environmental and Social Considerations (2010)

Similar to MICOA, JICA classifies projects into categories according to the extent of environmental and social impacts, taking into account an outline of project, scale, site condition, etc.

JICA has classified the N13 project a Category in line with MICOA's. In principle, JICA confirms that projects meet the requirements for environmental and social considerations and that projects comply with the laws or standards related to the environment and local communities in the central and local governments of host countries; it also confirms that projects conform to those governments' policies and plans on the environment and local communities

In the case of Category A projects, JICA encourages project proponents to consult with local stakeholders about their understanding of development needs, the likely adverse impacts on the environment and society, and the analysis of alternatives.
JICA recognizes that impacts to be addressed are based on needs of specific projects identified through the scoping process.
Impacts to be assessed with regard to environmental and social considerations for this project include impacts on human health and safety, on the natural environment, that are transmitted through air, water, soil, waste, accidents, water usage, climate change, ecosystems, fauna and flora, including trans-boundary or global scale impacts. Social impacts, such as including migration of population, involuntary resettlement, local economy utilization of land and local resources, existing social infrastructures and services, vulnerable social groups, gender, children's rights, cultural heritage, HIV/AIDS, and working conditions including occupational safety. Items to be addressed in the specific project are narrowed down to the needed ones through the scoping process.

2.4.2 AfDB's Environmental and Social Guidelines

In order to comply with the AfDB's requirements for environmental and social assessment studies, the following documents were consulted;
AfDB' environmental and social policies (2004);
AfDB's Environmental and Social Assessment Procedures (2003)
AfDB's Involuntary Resettlement Policy (2003)
AfDB's environmental and social guidelines (2001)

Key crosscutting issues that are required to be addressed for the nature and scope of the N13, Cuamba-Mandimba-Lichinga project are typical environmental and social components in the human and natural environments similar to those considered by MICOA, JICA and the World bank.

The ESIA report was based on the AfDB's guidelines Annex 10

3 PROJECT DESCRIPTION AND JUSTIFICATION

3.1 Project Location and Site

The N13 road in Niassa province, Mozambique passes through many small villages in four districts of Cuamba, Mandimba, Ngauma and Lichinga. The province is located to the north west of Mozambique and is the largest of all the provinces. The provincial political and administrative capital is Lichinga, while Cuamba is considered to be the economic capital of the province.

The project site is broadly divided into three terrains (0 - 148km: flat terrain, 148 -240km: rolling terrain, 240 – 302km: rolling with some mountainous terrain). The land undulates from a low altitude of 560masl reaching up to nearly 1,400masl at Lichinga. The existing horizontal alignment and vertical alignment of the road generally follow the watershed and the natural ground respectively. Figure 1 shows the location (in red) of the road N13.

Niassa province has great potential for agricultural development, forestry, mining and tourism. Currently efforts for economic development are negatively affected by poor conditions. Transport limitations create barriers for access to agricultural inputs, provision of basic social services to the population and provision of goods and local products.
Figure3 below shows the regional location map of the project.

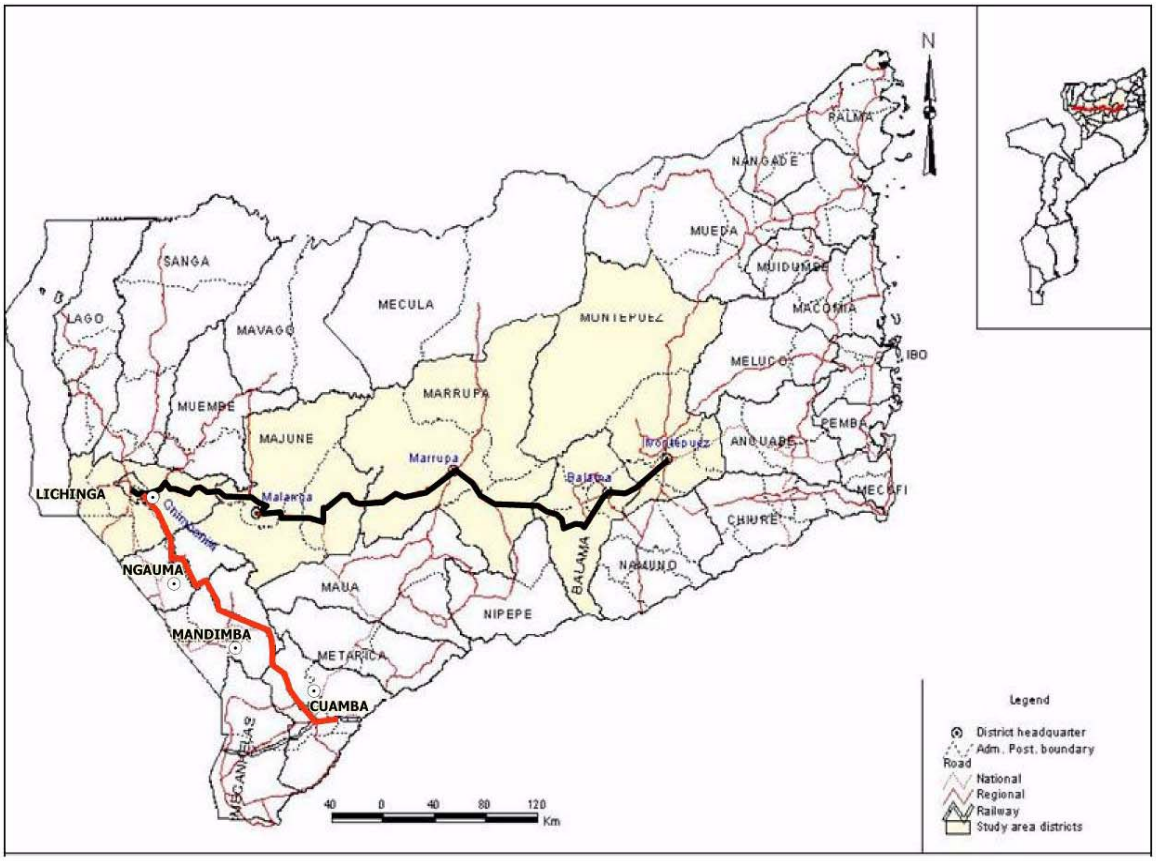


Fig. 3 Map showing Project Location

3.2 Justification of the Project

Niassa Province is located in the north eastern part of Mozambique, between latitude11° 25' N and 15.26' S and longitude 38.21'E and 34.30'W. It is the largest province in the country with an area of 129,000 km2.

Niassa province shares borders with; the Republic of Tanzania to the north, the Republic of Malawi to the west, the province of Cabo Delgado to the east and the provinces of Nampula and Zambezia to the south. The provincial capital and commercial center of Niassa are Lichinga and Cuamba respectively.

The province is characterized by large underutilized areas with a low and dispersed population density. Transportation difficulties contribute to constraints in the availability of basic services for the population. Most of the rural population is composed of small-scale producers. A variety of food crops is grown; the principal ones being: maize, cassava, beans, onion and garlic. Access to markets is difficult for small farmers because of the poor road conditions and high transportation costs.

Figure 4.1 Dust from a passing Truck

Figure 4.2 Damaged Road

The road is part of the Nacala corridor and provides a strategic link to the border with Malawi.

There are small paved sections of the road which do not negatively affect the environment and society however, there are numerous environmental issues associated with the unpaved N13 road. These issues include:

- Dust deposition on vegetation
- Erosion of the road and shoulders
- Deterioration of vegetation along the road
- Potential downstream sedimentation of rivers due to erosion
- Discomfort while traveling on the road due to potholes and cracks on the road
- Potential degradation of vehicle
- Accidents on the road
- Discomfort and health issues for people living along the road such as breathing problems.

In general, the road is damaged and requires frequent maintenance. During the rainy season it is virtually impossible for small vehicles to use due to drainage problems and erosion.

A rehabilitated N13 would facilitate access to provincial and district centers in the areas near the project. This improved accessibility would promote economic development in rural areas and consequently the reduction of poverty that prevails through out the region.

The rehabilitation and improvement project could reduce transportation costs and improve access along the corridor. The regional markets will be strengthened, as well as the expansion of agricultural production. It is believed that the marketing of small produce and the expansion of agricultural production would increase the business potential for agro-industrial processing not only along the corridor but the region in general. Expectations are for increased commercial activity to a revitalized regional economy along the corridor through to the areas of the commercial cities of Nacala, Nampula, Cuamba, Mandimba and Lichinga, as well as the border towns.

The road improvement will also stimulate the development of tourism by facilitating road access to tourist sites in other districts such as lake Niassa in Lago and the national park in Mecula Upgrading the road between Cuamba, Mandimba and Lichinga could result in an increase in tourists visiting from Malawi or Nampula by road. It is expected that Lichinga would be developed as a tourist centre to provide accommodation to tourists traveling along the route via Cuamba and Mandimba**.** In order to capitalize on the potential tourist market, the quality of services that cater to tourism should be developed such as hotel services, restaurants, car rental, as well as the provision of tourist information for the city of Lichinga. Efforts should be made to attract tourists for trips to nearby sights to Lichinga like the Lake Niassa, the Niassa Reserve and other nature reservation areas. These efforts may also include the establishment of a local board of tourism that involves the government and the private sector.

Rehabilitation of the road is essential to promote industrial development, for example the wood processing industry and mineral resources in the north western part of the Province. It will also allow geological and mining research to provide detailed information about the availability of geological and mineral resources that will attract mining investors.

3.3 Economic Analysis

Economic analysis conducted by the engineering consultants used HDM-4 and based on the assumption that the project life would be 20 years starting from 2014..

The Project scored an average level as an upgrade-to-paved intervention and its economic viability was acceptable, with an EIRR of over 12% of the opportunity cost among alternatives. Based on the result, the Project was evaluated as one of the prioritized

projects to be implemented in the nation. The particular importance of this primary road and of bringing it to all-weather travelable condition is well established. The Study concluded that upgrading the road was economically feasible in terms of the national economy of Mozambique.

3.4 Estimated Cost of the Project

The total estimated cost of the project is U.S.$ 125,297,100 (One hundred twenty five million, two hundred and ninety-seven thousand and one hundred U.S. Dollars), which will be applied to the activities of: clearing, building access, improvement of bridges, culverts, drainage and others.

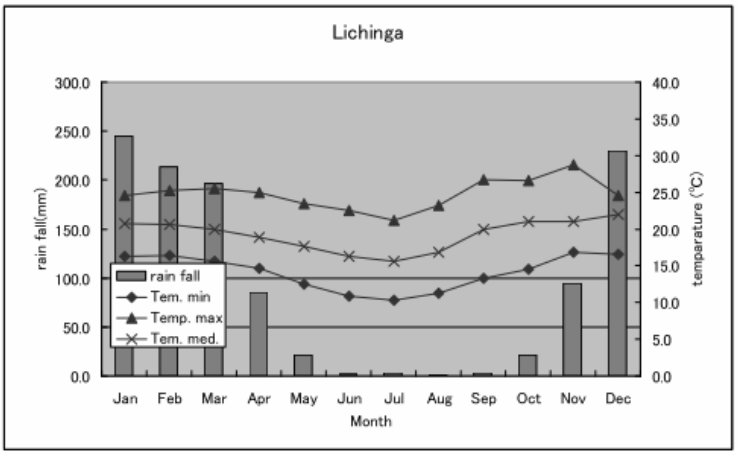
3.5 The Biophysical and Socio Economic Environment of the Project Area

3.5.1 Climate and Rainfall

The province is divided into two meteorological zones: The low-lying area in Cuamba with an altitude of 600m and the high altitude in Lichinga reaching over 1,300m above sea level.

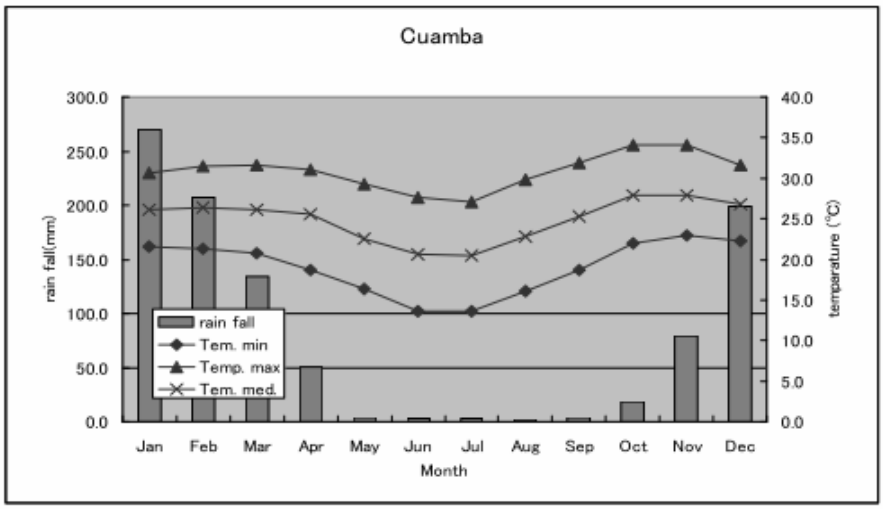
The average annual temperature varies between 14° C and 22 °C. The lower temperatures are in the district of Lichinga and gets gradually warmer towards Cuamba where temperatures could reach 35°C during the month of November. Temperature distributions in both districts are shown in Graphs 1 a. and b.

The project region is characterized by two distinct seasons throughout the year: a wet and dry season. The rainy season lasts from October to March and the dry season from April to September. The months of April and October can be viewed as transitional periods with no fixed patterns.



Graph 1a. Precipitation and Temperature in Lichinga

The high precipitation rates in the north and central part of the country is caused by the northeast monsoon and high mountains. Within Niassa the north western region, including Lichinga, has in accordance with being the highest part of Niassa, the highest precipitation rate which can reach 1800 mm per year. The central region, which includes Cuamba, receives 900-1200 mm per year and the driest region in the south east only receives 800-1000 mm per year or less. The climate of Cuamba is humid tropical and during the rain period, from October/November to March, the average precipitation is always above 800 mm. The rainfall intensity can be very extreme washing out soils from the agricultural fields to the seasonal rivers. Soil erosion is common on the road, particularly on some of the steep slopes in the section between Mandimba and Lichinga.



Graph 1b Precipitation and Temperature in Cuamba

The growing season for agricultural crops lasts from 180 to 210 days.
The climate in Niassa is stable compared to the rest of the country and therefore creates reliable conditions for agriculture.

3.5.2 Air Quality

Most of the road is unpaved and therefore dust pollution is common especially during the dry season. Residents and travelers along the road are exposed to dust pollution which could result in health hazard. Also, uncontrolled burning to clear the land for agricultural production releases smoke in the atmosphere to pollute the air.
There is no quantitative data on air pollution in Mozambique and there is no equipment available in the country to measure dust pollution on roads projects.
This study is therefore reporting analysis of the study conducted by the design engineers.

According to analyzed results, it seems that value of dust increases in conjunction with traffic volume in paved sections. Dust was the only air pollution found in the study area along the road. The study found no effluent emissions such as NOx, SOx and CO because of low traffic volume.

3.5.3 Noise Quality

The Goverment of Mozambique (GoM) has not establish an environmental standard for permissible noise level,.therefore some criteria should be adopted from other relevant organizations such as the World Health Organization (WHO) and the Japanese government.

The government of Mozambique, has a policy to build public facilities such as schools and health centers along the roads for easy access from rural areas. There is no existing data for noise and vibration and it did not seem to be a problem at the time of the study because of the low traffic volume on the study road. Considering that noise level increases with traffic volume, predictions by the design engineers are approximately 7,000 vehicles in Cuamba-Mandimba section and 8,000 vehicles in Mandimba-Lichinga section in 2035. This traffic volume will cause serious traffic noise pollution during certain periods in the day because the study showed that some schools are located in sensitive areas where the noise level exceeds the Japanese standard, therefore mitigation measures such as setting up soundproof wall on the boundary will be needed

3.5.4 Topography

Mozambique is in general a low-lying plateau of moderate height descending to the Indian Ocean with; a coastal belt covering about 44 % of the country; a middle plateau ranging from 200 - 1 000 m in elevation and covering about 29 % of the country; and a plateau and highland region with average elevations of around 1 000 m to the north of the Zambezi River covering about 27 % of the country. Niassa province has an altitude that ranges from 500 m up to the high plateau of Lichinga at 1300 m above sea level. Cuamba area is generally a flat landscape characterized by so called inselberg formations. The larger part of Cuamba district is between 500 and 700 m above sea level but altitudes over 1 000 m do exist, for instance the highest point is 1 836 m above sea level.

3.5.5 Soil

The N13 crosses a mosaic of soils. The predominant soils that are characteristic to Cuamba are the red soils, differentiated on the basis of medium texture (VM) or clay (VG). The

soils of the VG group are deep and well drained, the main limitation is potential erosion. VM soils occur on the top sand sides of steep slopes. Soils with orange-red tonal variations are found in some areas on the section Mandimba Lichinga. Figure 4.2 and are the major soil units traversed by the N13 (Mandimba-Cuamba-Lichinga).

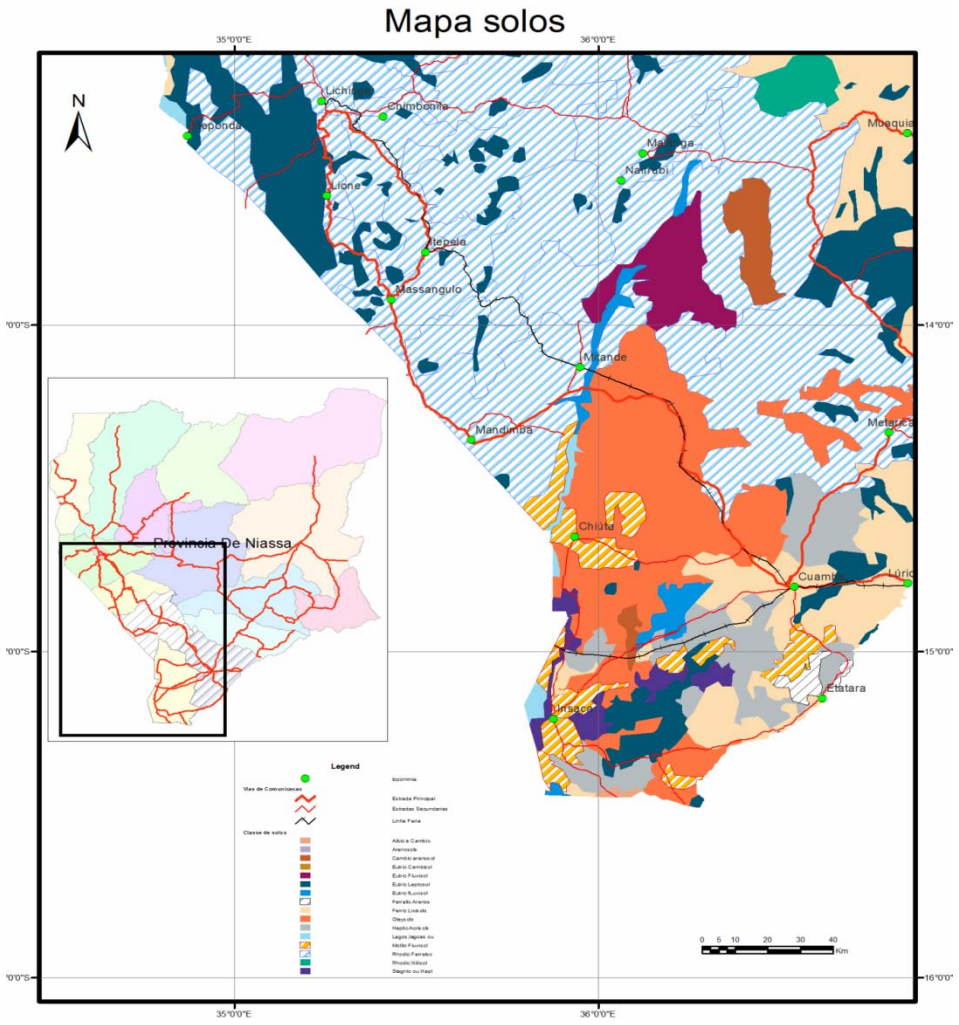


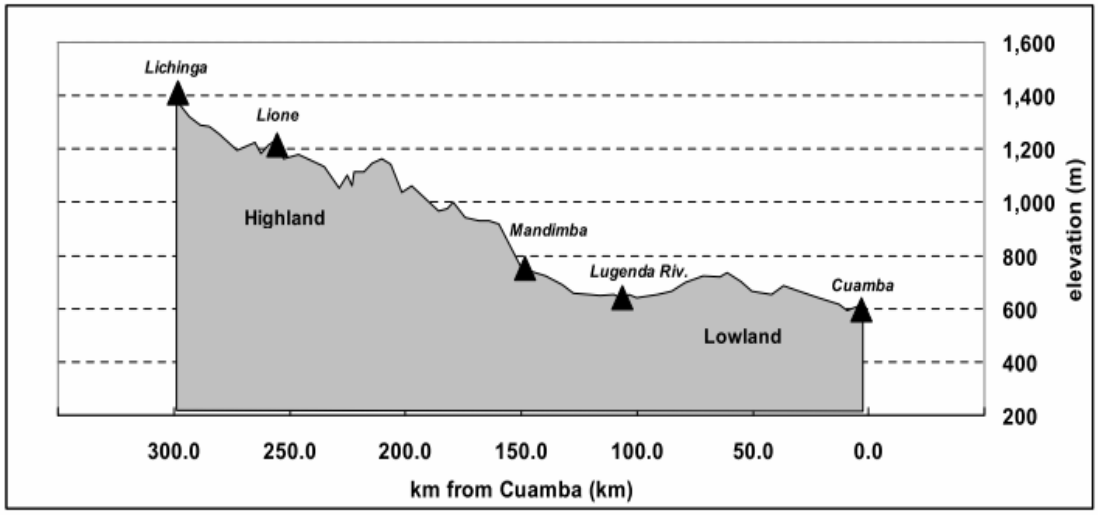
Fig. 5. Map of soil distribution in project area

3.5.6 Geomorphology

Niassa Province has five layers with different variations of terrain and topography. In the valleys of major rivers the altitude ranges from 200m to 400m.Thesub-plateau area of the District of Cuamba has altitudes between 400m and 700 m.

At altitudes above700m, are the average plateaus (plateau Metarica, the Alto Lunho, and the first platform of the Upper Niassa) where the terrain undulates. Above700 mup to1300

mare other spots, such as the Plateau of Lichinga. High altitude peaks occur in some mountains reaching 1500m above sea level.



Graph 3. Geomorphological classification between Cuamba and Lichinga

Upland areas, the surface consists predominantly of hard rock. In the valleys, plateaus and areas of greater incline, the area is characterized by layers of variable changes in thickness. Chart 4.3 shows the topographic variation within the study area.

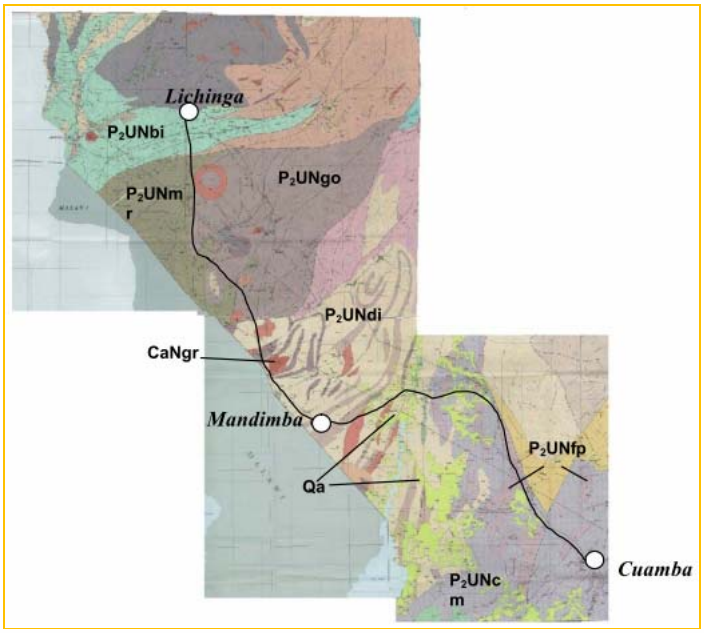
The section between Cuamba and Mandimba the geomorphology is slightly flat with a gradient of 0.12%. The section between Mandimba and Lichinga the elevation increases from 700m to1400m.

3.5.7 Geology and Mineralogy

A recent geological mapping of Niassa done over a four year period outlines the main geological units of the province, including the complex of Ponta Messuli, Unango, Marrupa, M'Sawise, Txitonga groups (gold band), Geci, the Karoo super group and kimberlites. Figure 6.shows the main geological units in the study area.

Niassa has great potential for mineral exploration because of the occurrences of gold, diamondsand, mineral coal. The following table shows the location of these occurrences.

The lower zones of the study area, the sedimentary layer (Quaternary) is thick and reveals the presence of isolated aquifers, with vast amounts of water.



A	Quaternary (Recent)	**Qa**		Alluvium deposit
B	Cambrian	**CaNgr**		Gneissic granite
C	Proterozoic (Pre-Cambrian)	**P_2UNgo**		Granitic to granodioritic migmatitic gneiss
		P_2UNmr		Chala gneiss(banded mafic granulitic gneiss
		P_2UNdi		Granitic to granodioritic gneiss
		P_2UNbi		Biotite gneiss, partly mylonitic
		P_2UNcm		Charnokitic gneiss, partly migmatitic
		P_2UNfp		Monte Elinasse Charnoclitic granofels and gneiss

Fig. 6 Geological Classification of the Road Cuamba-Lichinga

3.5.8 Hydrology

Niassa has three basins: the Rovuma Basin (Lugenda rivers, Lucheringo, Luchimua, Luambala, and Luculumezi Lualessi), the Zambezi Basin (Lunho rivers, Luangua, Luaisse, Machel, Luchemange, Meliluca, Mandimba, Ngami, Lussangasse Lake Niassa, Amaramba, Chiuta, chiruand Michemazi) and the Lurio basin rivers (Muanda, Luleio, and Ruruamuana Massequesse). Figure 7 shows the hydrology in the Study Area.

Niassa has good availability of water for various uses. The high rainfall provides good power for the river system and water uptake by soil sin the valleys. Warm temperatures and rainy weather, coupled with the geological-structural conditions of the soil allow the

formation of ground water in shallow depths.

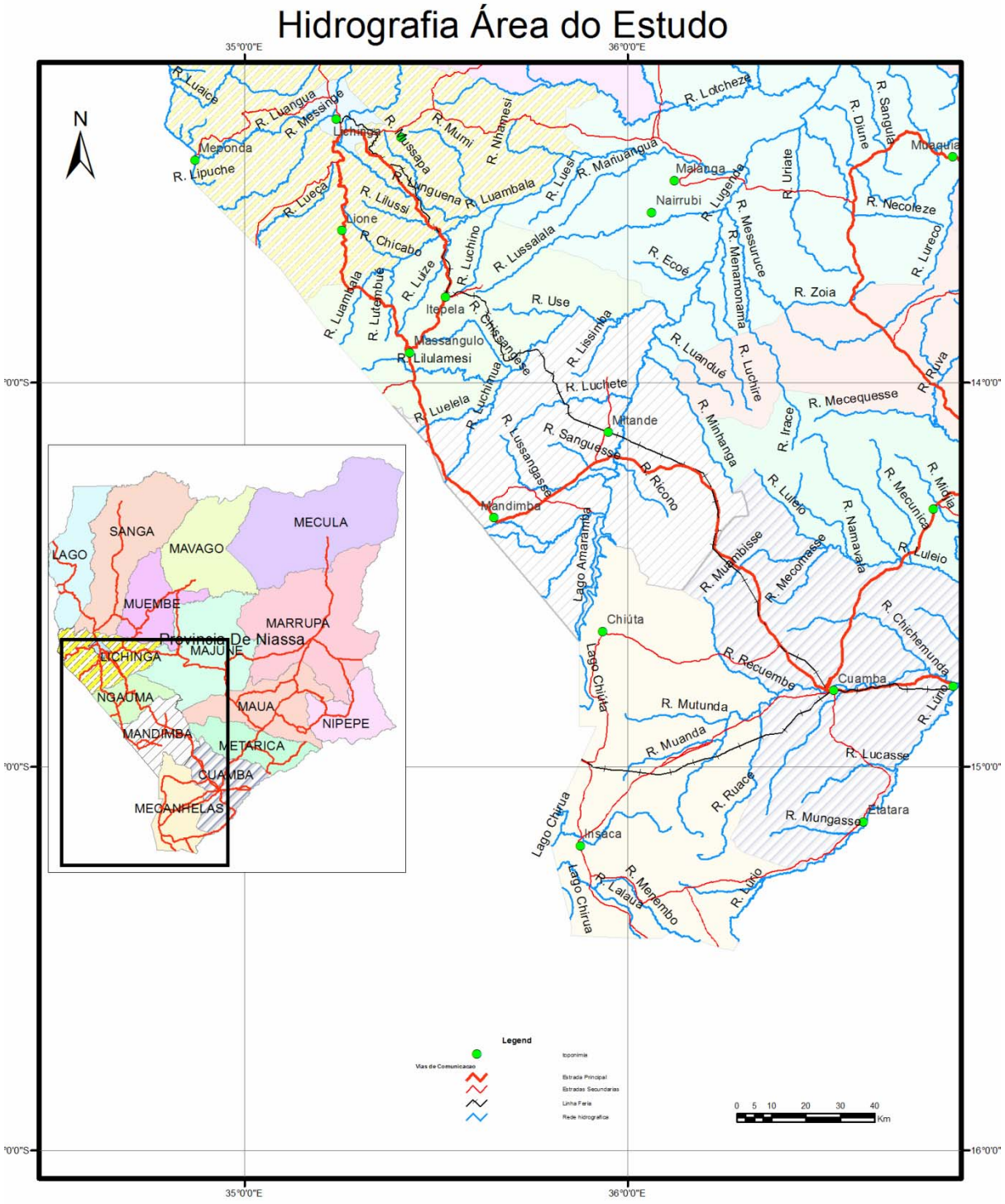


Figure 7: Hydrolology Map of the Study area

A problem that hinders the uptake of water in some areas is the fact that, with the exception of major rivers such as the Rovuma and Lugenda, the hydrographic network of Niassa's predominantly intermittent rivers lose ground water during the dry season.

The section of the N13 between Lichinga and Mandimba crosses several rivers. The general direction of flow of most of the rivers is from south to north. Some rivers in the section between Cuamba and Mandimba don't have power because the topography is quite flat. Thelargest river in the study area is the Lugenda which springs from Lake Amaramba along the border between Tanzania and Mozambique before flowing into the Indian Ocean.

3.5.9 Vegetation

Data on the last forest inventory indicated that Niassa has the largest areas in the country with about 9.4million hectares of forested area above the national averageof about 77%. The dominant vegetation type in Niassa, the Miombo is characterized by diverse, dense open forests. A lot of the vegetation is of low commercial value, which in part explains the low trading volumes. In termsof vegetation with greater volume are Messassain carnate (*Julbernardiaglobiflora*), Messassa (*Brachystegia spiciformis*) and Metongoro (*Uapacak irkiana*). In addition to the native forest Niassa has an estimated 2.4 million hectares for the establishment of forest plantations for fast growing vegetation.

The Lichinga Plateau (between Mandimba and Lichinga) is the region with the greatest potential for development of commercial plantations. Along the N13 between Lichinga and Ngaúma are extensive areas of forest plantations.

The proposed project area is covered by a forest of miombo type dominated by savanna grassland. The area from Cuamba to Mandimba is flat and covered by open forest and grassland. Mandimba to Lichinga area is mountainous and is covered with mixed miombo forest. Most of the vegetation in Cuamba and Mandimba District has disappeared due to 'slash and burn' farming practice and the remnants include fruit trees and seasonal grasslands in the swampy areas. Deforestation is on the increase in Ngauma District as a result of charcoal production.

There are no gazetted and protected forest reserves, national parks, and rare or endangered tree species in the project area.

Figure 8 shows the types of vegetation found along the N13 road.

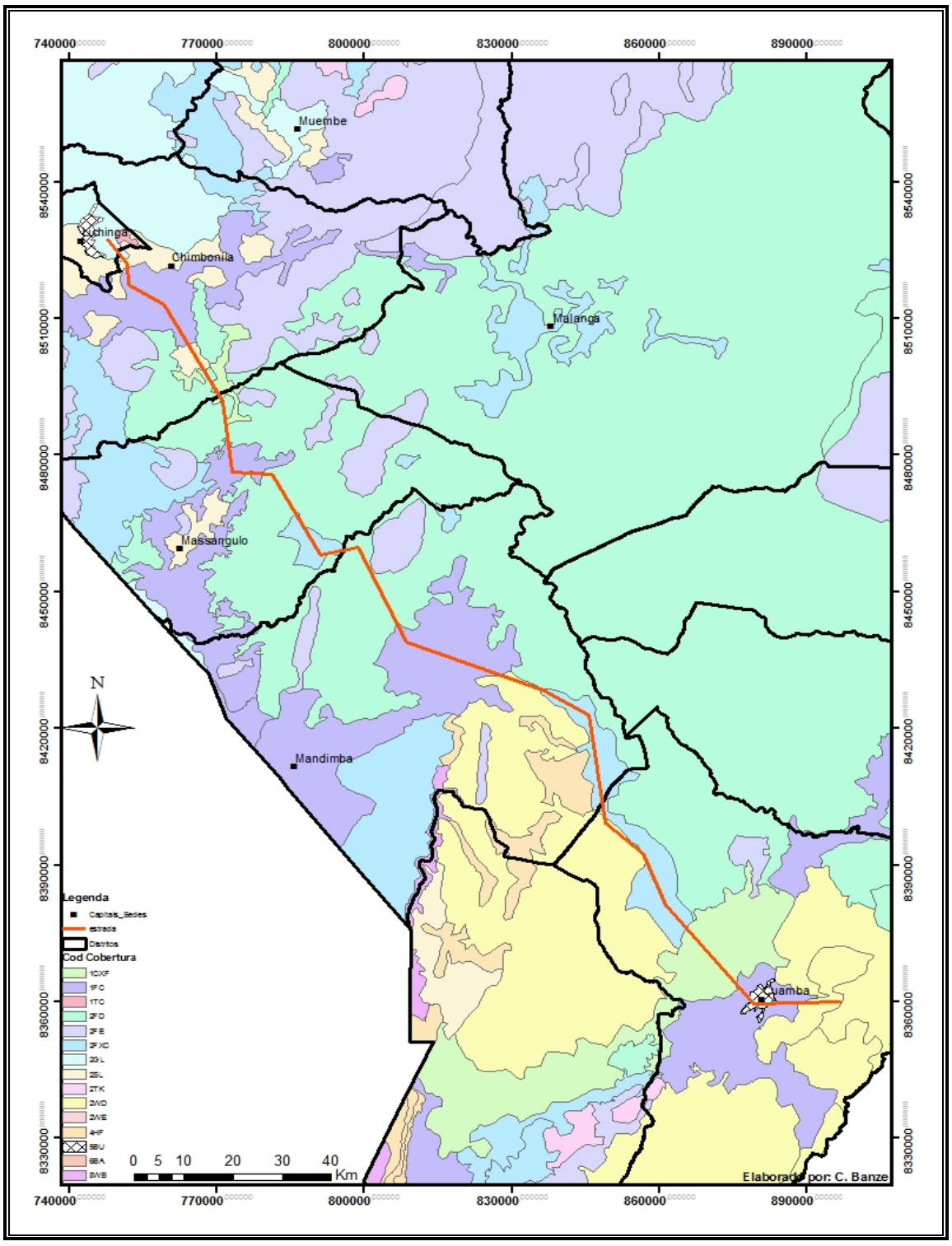


Fig. 8 Types of vegetation along the N13-Cuamba- Mandimba-Lichinga Section

3.5.10 Agriculture

Agriculture is the main activity for most rural families and it is estimated that Niassa province has12.3 million hectares of land suitable for agriculture, of which 9.6million is in average to excellent condition.

Agricultural production influences the distribution of the population, being higher in the area between Lichinga and Cuamba. Subsistence agriculture is the traditional practice in almost every district. This type of farming is characterized by small areas of approximately 1.6ha in upland areas. Shifting cultivation is now widely practiced because of climate change and diminishing soil fertility.

Agriculture is the largest economic sector and provides important food crops and income for most people in the province. The main crops and foods produced in small areas are: corn, beans, peas, sunflower, wheat, potatoes, soybean, sorghum, cowpea and sesame. Cash crops are tobacco, cotton and sesame. A small quantity of sesame finds its way in the export market. Fruits produced are; banana, mango, papaya, avocado and melon.

In the southern part of the province, the rail link supplements the limited road access to markets.

Fig.9 Banana Plantation on the road side

In addition to the cultivation of annual crops the province has the potential to develop forestry activities. In the northern part of the province, the industrial tree plantations have

been developed by foreign investors. Tree harvesting will start in 2013 and the logs and wood product will be transported by rail from Lichinga and Cuamba to the port of Nacala for export.

The forest projects of Niassa occupy an area of 210 hectares, including 110 for planting and the remainder for storage. In the section between Cuamba and Lichinga, there commercial forestry companies and these represent a source of income for families.by providing employment for locals.(Figure 10)

Fig 10 -Cuamba District **Lichinga District**
Mozambique Leaf Tobacco Forestry Plantation **Workers of Chikweti Forests**

.

Along the N13 portions of land with crops that would be removed from the COI , would require affected families to be compensated. This has been considered in the RAP developed as part of this study.

3.5.11 Livestock

Niassa's livestock development is poor and composed of 850 cattle, 286,081goats, 41,361sheep, 28,296 pigs, donkeys and over 1,304,472 chickens in the family sector at the time this study was conducted. The weak development of cattle farming is mainly due to the high incidence of Tsete fly throughout the entire province. Public infrastructure for cattle production and management is either underdeveloped or non existent and the quality of pasture is poor.

Livestock is marketed in two ways: (i) through ambulant traders who buy from the breeder in rural areas and re-sell to the consumer market and (ii) by direct contact between consumer and producer.

It is estimated that the city of Lichinga produces between 25 and 30,000chickens a month. Chicken production in the province can be estimated at about 10,000 per month, and is enough to supply the local and regional markets. There is a potential market for increased production or new ventures such as egg production.

3.5.12 Fauna

Districts on the N13 have a low diversity of fauna, although the province presents a great diversity of fauna such as at the Niassa Reserve which is an important sanctuary for wildlife, with the occurrence of elephants (*Loxodonta africana*), Kudos (*Tragelaphus strepsiceros*) Palapala, lion (*Pantera leo*), leopard (*Pantera pardus*), spotted hyena (*crocuta crocuta*), zebra (*Equus burchellii*), red chang, mountain goat, monkeys (*Gray and Simango,civets*), impalas, and warthogs.

In addition to the Niassa Reserve, there are many other wildlife conservation parks in the province such as the *Sangha* from *Macaloge Matchedje*, mountain formations around Lake Niassa and the southern part of Marrupa covering Nung, Nipepe, Maúa and Metarica. The road does not cross the Mandimba Lichinga area where the flora and fauna are protected. However, there is a known route for elephants in the Cuamba-Mambimba section shown in Figure 11 as reported by the national wildlife census of 2008.
It should be noted that there is no documented evidence of elephant crossing the N13 project area in recent years. In consultation with the wildlife department in the ministry of agriculture at provincial and national levels and the WWF, there is no record of elephant migration route in the road project area. WWF has no program or plan regarding the movement of elephants in the project area. It was therefore concluded that the road improvement project will not cause a direct negative impact on elephant migration. Nonetheless, mitigation measures will be recommended in the event of the occurrence of stray elephants especially between km 27 and 97 in Mississi and from km 108 to 125 in Chipa.
Measures recommended are (i) to construct speed humps, (ii) erect road signs and (iii) backfill borrow pits at the end of construction

There are no habitats of rare and endangered fauna species in the road project area between Cuamba and Lichinga..

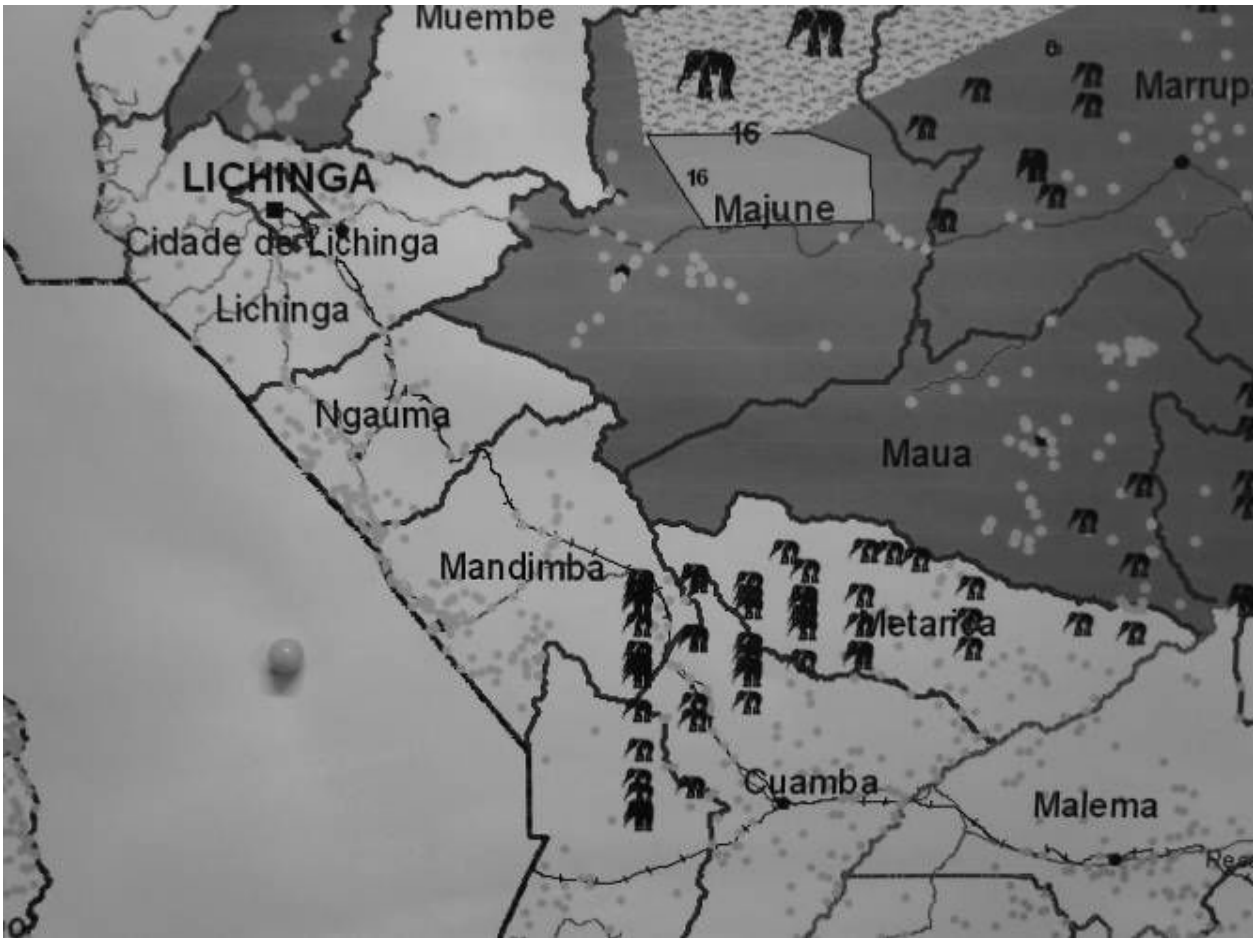


Fig. 11:Principal route of elephants in Niassa Province (National Census of Wildlife 2008)

3.6 Socio-Economic Profile

3.6.1 Administrative Division

As indicated in Figure 3, the road is located in Niassa Province. The total length of the road is approximately 302 km, across 4 districts (Cuamba, Mandimba, Ngauma and Lichinga), including the section between Mandimba and Malawi border.

3.6.2 Demography and Settlement

According to the Census of 2007, the total population for Mozambique was estimated at 20. 2 million and a population density of 22.5 inhabitants per km^2 . Niassa Province is the largest and the least populated in the country with about 1,213,398 inhabitants and a population density of 9.53 per km^2. The population of Cuamba district is about 184,773 and a population density of 34.48 km^2, Mandimba; 133,648 and population density of 28.5 and Lichinga 94,.972 with a population density of 17.52..

3.6.3 Socio-Economic Activities

Agriculture is the main occupation for attaining livelihoods in the project area. Crops and livestock are produced principally for food and cash. Major crops grown are maize, beans, tobacco, millet and peas. Livestock production is on a small scale and is mainly small ruminants and poultry. The second important economic activity is selling food and household items in small shops near the road.

There are no industries in the project area however with the activities of the commercial forest enterprises, there is a potential for industries in the region.

3.6.4 Land use and Natural Resources management in the Project Area

The land, water and forests are natural resources of vital importance to rural communities. The land is used for production for economic, social, cultural and subsistence farming. Forests are where firewood, building materials for housing and natural products are obtained as well as where ritual ceremonies are performed.

Water is another natural resource of vital importance to the lives of communities and is used primarily for domestic and animal consumption, agriculture and fishing.

This study area's water supply, like most of the country's water supply is precarious. Most wells and boreholes are located at the district headquarters, while the majority of the rural populations get their water supply from rivers, streams and ponds.

Climate change over the years has led to an increase in the practice of shifting cultivation, resulting in a semi-nomadic agrarian practice. Traditionally rural communities have three types of "farm land" according to the seasons. During the wet season (November to March), the population uses the highlands with good drainage. When the wet season ends, land near the river banks are used and eventually land that had previously been submerged during the rainy season

The main cropping areas are often at long distances, about 1 to 2 km from the houses. Due to transportation difficulties farmers set up temporary residences closer to the farm.
Throughout the study area it was observed that agricultural crops such as corn, sorghum, cassava and beans were produced for subsistence whereas cotton and tobacco are cash crops.

The process of land use and its resources is guided by standards established by the National Land Policy, which articulates that the customs of rural communities should be taken into account. Along the N13, land ownership (right to a parcel of land) is not only determined by the National Land Policy, but also by customary law.

According to the results of the first poverty assessment in the country (MPF, IFPRI, 1998), the majority of rural households have at least a portion of land for agricultural purposes.

In Niassa Province 95% of the rural population owns an estimated area of 0.3ha of land per family. The practice of shifting cultivation (adapting to climate change) leads to each family owning two or three "fields".
Niassa has extensive areas of vacant land with agricultural potential making this type of agricultural practice possible.

The natural vegetation is characterized by miombo, low open bush, forest and open forest floodplain. Statistical data for land use and land cover in the districts traversed by the N13 shows the presence of extensive areas of open lowland forest outside the city of Lichinga.

The section between Lichinga and Mandimba it was noticed that planting forests represent a source of income for families. Figure 3.2 below shows the vegetation map in the study area.

3.6.5 Existing Infraestruture and Social Services

The majority of Niassa has very few infrastructures. The location of the Niassa province is quite remote from the main centers of production and consumption in the country, especially due to the weak interconnection of access roads and transport systems, resulting in poor integration of the province in the national market. As a border province, Niassa is important in its role for the country's integration in Southern Africa.

The road network of Niassa covers 7,690km in total, including primary roads (870 km), secondary (1,420 km), tertiary (1,208km),and unclassified (local roads, 4,570 km) of major importance are the N14 that connects to Pemba Lichinga, the N13, that links Nampula to Lichinga, N.360, connecting Cuamba to Marrupa and N361 which connects Lichinga to Metangula (Table 4.2). Most roads in the province of Niassa, including tertiary roads are unpaved. For the most part transit between April and December can be considered as reasonable.

Of the7,690 km road network in Niassa, 4,000 km are in good condition (52%), 2,072 km are in reasonable condition (27%), 1576 are in poor condition (20%) and the remaining 1% are impassable.

In terms of social infrastructures such as power lines, water supply, sewage and communication cables, only power lines are observed along the N13 in the town section of Cuamba and Lichinga. Additionally, high-voltage cable crosses over the road at 41km from Cuamba.

Schools and health centers located along the road are shown in following in the fig. 9.

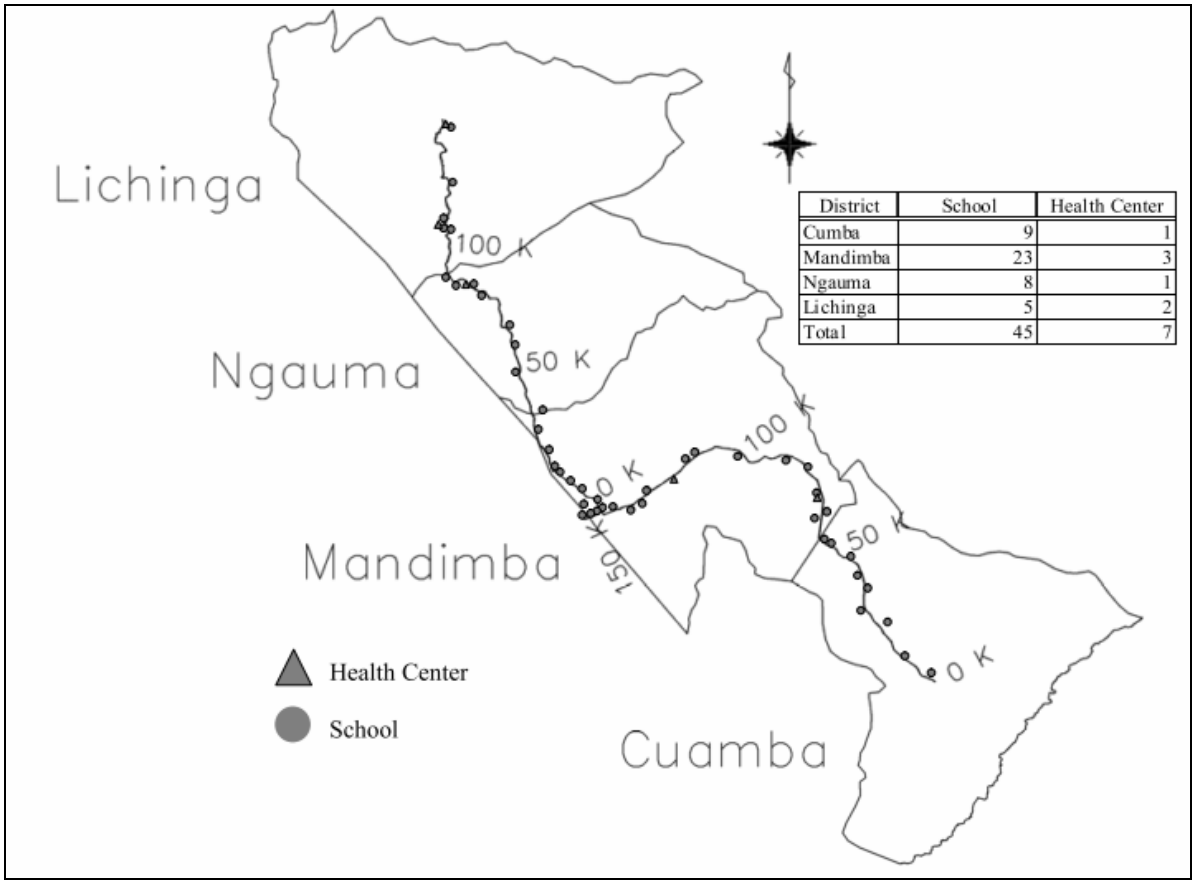


Fig. 9. Schools and health Centres along the road N13 (Eight-Japan Eng. Consultants 2010)

3.6.6 Current Resettlement Issues

The area covered by the project has houses, fruit trees, trading outlets, small farms and some cultural sites that could be subjected to resettlement and/or compensation. Once it comes to rehabilitating an existing road, there are no alternative sites best to avoid or minimize the relocation of people. However, the realignment of the road should be done to avoid destroying the graves that exist along the line of the road.

A Resettlement Action Plan has been developed based on the AfDB and JICA's guidelines for involuntary resettlement.

The Resettlement Action Plan (RAP) was prepared to ensure that construction of the N13 Road, in built up areas, will have minimum impacts on the Project Affected Persons (PAPs), their structures and livelihood. Hence some of the mechanisms to minimize adverse impacts of displacement of people and their structures must include:

- Relocation or repositioning of affected structures to within the surrounding areas;
- Paying fair compensation in time and before PAPs' property is removed;
- Maintaining or improving PAPs' means of livelihoods;
- Ensuring that PAPs' grievances, in relation to the project, are accommodated and addressed promptly; and
- Providing employment to PAPs, as an alternative source of income, where appropriate.

A total 2,639 persons in 531 household (includes PAPs with houses within the COI and those with other properties such as gardens exclusive of their houses.) will be affected by the road project. 531 households will be physically displaced and will be relocated to new sites outside the COI. The backyards of the houses in the COI are spacious and discussions with the PAPs and local leaders led to the agreement that people will shift demolished houses inwards behind the existing location. The displaced persons will require fair, adequate and timely compensation for their lost houses. .

793 structures will be affected. These include 531 houses, 51 kitchens, 141 shops, 29 maize stores, 24 toilets, 8 sheds and 9 other structures. Other affected properties include 1,850 fruit and plantation trees, 152 small gardens covering an area of 33.03 hectares, 75 yards covering an area of 52 hectares and 40 graves. It was noted from the field investigations that with the 9m COI there will not be any mass movement of graves. However, it is strongly advised that moving graves should be avoided by shifting the road from the side with the graves to the other side

The total estimated cost of relocation and compensation is US$1,254,863.70. This includes US$: 802,811.80 for buildings and structures; 16,938.69 for assistance for opening new gardens; 58,172.87 for trees that will be lost, 22,622.70 for exhuming and repositioning graves; 188,571.43 to be paid for loss of income to shop owners; 11,213.15 as allowances

for vulnerable groups, 10% ($110,033.06) of the total amount of compensation to be paid as contingency for eventualities and $ 44,500.00 for monitoring of the RAP

The socioeconomic studies, among other things, revealed the following important observations:

- in general, rehabilitation of the N13 Road will not deny the majority of PAPs opportunities to revert to their current lifestyles, after the road construction;
- the site is likely to benefit from infrastructure and social development associated with the project; and
- moderately adverse impacts of relocation such as loss of land for cultivation and loss of property are envisaged. These impacts will be short term and manageable provided the recommendations of this RAP are followed.

4 DESCRIPTION OF THE PROJECT

The project consists of rehabilitation and upgrading approximately 302km of existing road from Cuamba to Lichinga which includes 6km from Mandimba to the border with Malawi.

From the preparatory survey carried out by the engineering consultants,
The first section of the road, from Cuamba to Mandimba including the section from Mandimba to the Malawi border

4.1 Main Project Phases and Activities

The main project activities will include:

4.1.1 Planning and Design

Planning and design works will include:

a) Surveying for the road alignment.
b) Selection of a consultant for the detailed design. This will require five months procedure.
c) Preparation of drawings, bills of quantities and design reports. This will require minimum four months.
d) Preparation of the ESIA report with recommendations and the environmental management plan. This will require eight to nine months and the ESIA will be submitted to The African Development Bank (AfDB) 120 days prior to the submission of the appraisal report for the project.
e) Preparation of Resettlement Action Plan (RAP).
f) Tendering for construction contractors. This will require nine to ten months and will including pre-qualification, tender announcement, tender preparation limited to 90 days and tender evaluation by ANE and lending agencies.

4.1.2 Construction

Construction will involve:

a) Earth works which will comprise of cut and fill.
b) Haulage of embankment material from borrow pits and disposal of surplus material from the project sites.
c) Road surface preparation (application of sub grade, cement stabilized gravel sub-base courses and gravel wearing as well as crushed stone bases.
d) Application of road pavement and seals.
e) Concrete works for bridges, drainage and culverts.
f) Various activities such as painting, planting grass and other road finishing works
g) Construction of temporary structures. These include the contractor's camps which comprise of contractor's office; workers temporary houses and toilets; plant, equipment and materials sheds.

Construction work and supervision service will require about three years (33 months). This will be followed by demobilisation of the contractor's facilities and will involve removal of left over construction materials, plant and equipment, redundant contractor's offices, worker's temporary houses and toilets.
Many of the potential impacts of the project will occur during construction and these may include noise, accidents, dust, and alteration to natural drainage, deforestation, pollution/contamination and siltation.

4.1.3 Operation and Maintenance

Operation activities essentially relate to the various uses of the road for travelling and transportation of goods. Main impacts from operation are road accidents, which may result in loss of life or damage to property.

Road maintenance activities usually involve the use of heavy plant and equipment and this may have similar potential impacts to operation activities, in addition to traffic delays.
ANE's ten provincial delegations are responsible for the implementation of all maintenance works on classified roads. The Directorate of Maintenance will ensure that the delegations in the provinces are fully aware of and complying with the technical and operational guidelines for the implementation of the annual maintenance plan of the N13 road.

4.1.4 Demobilization Phase

After construction activities, demobilisation of the constructor's works to vacate the site will follow. This will involve removal of left over construction materials, plant and equipment, redundant contractor's offices, worker's temporary houses and toilets.

4.2 Summary of Construction Outputs and Inputs

Main inputs of the proposed project include construction materials such as quarry stone, sand cement, bitumen, and water. Other inputs are labour transport and energy. Main outputs will be the tarred road, new bridges and culverts; and by products will include construction wastes and rubble from breaking of the old bridges. Inputs for the project have a bearing on mining (quarrying), depletion and destruction of natural resources while outputs or by-products may lead to pollution and contamination of water, soil and air. Table 2.1 summarises the five main project stages outputs and the inputs (machines and materials) to undertake the project activities. Knowledge of these inputs and materials and how they will be sourced and used facilitates prediction of the potential environmental and social impacts of the project.

TABLE 2.: SUMMARY OF THE MAIN INPUTS AND OUTPUTS OF THE PROJECT ACTIVITIES

Key project stage or output	Main machines	Materials
Land preparation	• Graders • Excavators • Bull dozers	Water
Construction of main and ancillary roads	• Graders • D6 • Rollers/Compactors • Tippers	Quarry stone, Sand, Cement, Bitumen and Water.
Bridges, Box Culverts and Drainage	• Tippers • Rollers/Compactors	Quarry stone, Sand, Cement and Water.

4.3 Project Estimated Cost

The total estimated cost of the project, comprising the main project components of land clearing, construction of main and ancillary roads, bridges, box culverts, drainage etc.is US$125,297,100.

5 PROJECT ALTERNATIVES

In order to review the environmental and other cost benefits the consultant has considered the with project and the "without project" alternative.

The "Without project" alternative assumes that the road alignment is retained and the main reason for upgrading the N13 between Cuamba and Lichinga would not be achieved. The capacity and running speed of the road would not be enhanced and the predicted economic and social development would not take place. Development opportunities, such as easy movement of agricultural inputs and produce, easy movement of people, reduced vehicle operating costs, creation of new jobs etc. would not be fulfilled. a This alternative will not cause any additional adverse environmental and social impacts to the current situation in the project area of influence..

In comparison the "With the project" alternative that requires partial realignment of the road and bridge work, will satisfactorily comply with SATCC standards and therefore the rehabilitation will conform to the existing road geometry. there will be accelerated economic growth and the current environmental and social impacts would be mitigated through implementation of the environmental management plan.

Based on the environmental and other costs and benefits, the following three options were proposed.

Option-1 involves clearing the legal Right of Way (ROW) which for national roads is approximately 30m outside the shoulders of the existing road. This will affect about 5,848 structures in all towns and villages in the project area. This option has a high cost benefit ratio and was not recommended

Option-2 as proposed in the preparatory study by the design engineers involves clearing approximately 7m from designed shoulders representing a total of 14m width. The effect of implementing this alternative will exclude major villages and towns in the project area. A total of 970 structures will be affected. While this option has a low cost it compromises road safety and was therefore not recommended.

Option-3 proposed by the client ANE which is a corridor of impact that extends approximately 9m from the shoulders. This will reduce the number of project affected persons (PAPs) and will also guarantee road safety. 793 structures will be affected

This option was selected for use on the project

5.1 Definition of the Area of Influence

The project's main area of influence covers the geographical areas affected by the project in the districts of Cuamba, Mandimba, Ngauma and Lichinga. Where the impacts occur outside of these Districts these are described and appropriate mitigation measures identified.

5.2 Direct Area of Influence

The Direct area of influence is the area where the project impacts directly, areas that will be directly affected by the road construction and rehabilitation activities such as where there will be changes to existing land use. This area covers the entire width scheduled for rehabilitation, as well as the area road reserve.

For the socio-economic component, covers the indirect influence limit as well and this includes the administrative areas that will suffer the direct impacts, all the villages across the N13 (Cuamba-Mandimba-Lichinga). These are also the areas where much of the casual labor will be recruited and also where new infrastructures associated with the project will be built.

With the implementation of the project, the pressure on natural resources will be reduced, since many of the people hired as casual labor will cease to depend on them. This means that money will be available for paying rent and acquire inputs for farming and subsequently will be added value for the communities along of the road.

Additionally, it will reduce the drain of skilled labor to big cities in search of work.

6 POTENTIAL IMPACTS AND MITIGATION/ENHANCEMENT MEASURES

6.1 Introduction

6.1.1 General

The study objective is to identify environmental issues and problems along the road and make assessment of the possible impacts of the project on the environment and thereafter, propose mitigation measures in order to reduce or eliminate those impacts assessed as negative. Baseline studies have been completed, and our analysis of the existing situation and potential impacts of the proposed development have been analysed. Also actions are discussed which are intended to protect the environment during the implementation of the project

Significant potential positive and negative impacts associated with the proposed project are discussed in this chapter. Mitigation measures to avoid, reduce or eliminate the potential negative impacts; and to enhance the positive ones are also developed.

6.1.2 Environmental Landscape

The environmental landscape through which the road traverses is variable. The project road traverses land with its much-depleted natural vegetation now replaced by varieties of tall grass and low bush. Bush fallow regimes are down to 6 years further away from the road, in contrast with lower fallow periods in settlements nearer the road. The type of agriculture practiced is that which hinges about the family. The average household size in communities in the corridor of the road is 07, and the population are mostly farmers and traders. Most households rely on subsistence agriculture. There are however enterprising farming units producing a wide range of cash crops such as tobacco and sesame and some food crops in excess for marketing. Food crops marketed include cassava, sweet potato, rice and beans. Most are produced for the local market. The rehabilitation of this road will therefore greatly enhance movement of produce and contribute to agricultural development.

6.1.3 Land Use

The land has been utilized in a variety of ways, depending on soil character and variability. Soil fertility in this belt is rated as moderate to rich with open forest. Agricultural production is limited to typical rain-fed crops. Livestock production is rare. Reconstitution of the large ruminant population that was decimated during the war is now limited to goat and sheep rearing.

Migration of people to communities closer to the road will occur when the project is implemented. This could put pressure on the land, causing trees to be destroyed to free land for food production. This could also inadvertently destroy the landscape and natural habitats of plants and animals. Furthermore, such pressures could lead to conflicts over land use between roadside landowners and new comers, and this will have to be addressed.

6.2 Approach and Methodology for Impact Identification

6.2.1 Identification of Potential Impacts

Identification of environmental and social impacts was based on secondary data from pre-feasibility study reports and from government documentation and statistics; complemented by field investigations and socioeconomic studies of the project site. This involved physical assessment of the following environmental components likely to be impacted:

1. physical /chemical;
2. biological /ecological;
3. social /cultural; and
4. economic/operational

Based on the activities proposed in the pre-feasibility study report, the approach followed included.

- Step 1: Analysis of topographical maps and satellite imagery, in order to identify the main environmental and social components of: *topography, forest cover, agricultural land, villages infrastructure and water resources.*
- Step 2: Site investigations, focusing particularly on the areas of project influence along the road, to identify critical environmental and social elements to be affected including *settlements, social infrastructure, cultural sites (including graveyards), water and sanitation, health, flora and fauna, soils and local economy.*
- Step 3: Screening of the anticipated potential and significant impacts of the project in accordance with the project stages of *planning and design, construction, operation and maintenance and decommissioning.*

Simple matrices were used to identify and evaluate the significant impacts.

6.2.2 Impact Evaluation and Scoring Matrix

The environmental and social impacts were established through analysis of the proposed project activities and determination of their influence on the baseline environmental and social characteristics of the proposed project area. The environmental characteristics include biophysical (topography, soils, climate, rainfall, water resources, flora and fauna) and social (demography, settlement, land administration and tenure, economic activities,

infrastructures and services, water supply and sanitation, healthy and HIV and AIDS prevalence). The impact on the environmental and social components evaluated in terms of the following attributes:

Magnitude: a measure of the general degree, extensiveness, or scale of impact;

Significance: a measure of the importance of a particular impact on the environmental and/or social component under consideration;

Probability of occurrence: an estimate of the probability of an impact occurring before mitigation is applied and;

Duration: the period of time over which an impact may occur, from once-off to continuous for the life of the project.

TABLE 3: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND SCORING METHOD

1 Impact: Employment Opportunity						
Score	1	2	3	4	5	Score 1 to 5
Magnitude or Extent	Impact will occur only on site.	Impact will occur on site and beyond	Impact will occur at district level.	Impact will occur at district level and beyond	Impacts will occur at regional level.	
Significance	Low. A small change that is hardly detectable	Moderate. The impact that is measurable, but does not alter processes	High. Many people or organisms lost or affected. Major disruption of settlements, ecosystems or processes.	Very high. A community, process or area is completely disrupted or destroyed. Loss of all affected organisms.	Unknown. Insufficient information is available to determine impacts – apply cautionary principle.	
Probability of occurrence	0 (Impact will not occur)				1 (impact will definitely occur)	5
Duration	Short term, during the planning and design phase only.	Medium term, during early operations.		Long term, for the entire operational phase.	Very long term, for the entire operational phase and after closure.	1
TOTAL SCORE						10

TABLE 4: ENVIRONMENTAL SOCIAL IMPACT SCORES

Impact		Magnitude or extent	Significance	Probability of occurrence	Duration	TOTAL SCORE
IMPACTS DURING PLANNING AND DESIGN:						
POSITIVE IMPACTS						
1	Employment opportunity	3	1	5	1	10
NEGATIVE IMPACTS						
1	Loss of graveyards	-1	-4	-5	-2	-12
2	Loss of farm land and property	-1	-4	-5	-1	-11
IMPACTS DURING CONSTRUCTION:						
POSITIVE IMPACTS						
1	Employment opportunity	4	1	5	1	11
NEGATIVE IMPACTS						
1	Air pollution	-3	-2	-5	-1	-11
2	Soil contamination	-1	-2	-5	-1	-9
3	Soil erosion	-1	-3	-5	-1	-10
4	Noise and vibrations	-1	-2	-5	-1	-9
5	Loss of indigenous vegetation	-3	-3	-5	-1	-12
	Interruption of normal traffic flow	-1	-2	-5	-1	-9
7	Disruption of electric power and telephone service	-5	-2	-5	-1	-13
8	Spread of diseases	-2	-2	-5	-3	-12
IMPACTS DURING OPERATION:						
POSITIVE IMPACTS						
1	Increase in development	4	3	5	4	16
NEGATIVE IMPACTS						
1	Loss of indigenous vegetation	-1	-3	-5	-1	-10
2	Increase in road accidents	-1	-2	-5	-4	-12
3	Loss of jobs due to completion of construction works	-1	-2	-5	-1	-9
4	Wastes from contractor's demobilization	-1	-2	-5	-2	-10
IMPACTS DURING DECOMMISSIONING:						
NEGATIVE IMPACTS						
1	Loss of jobs, business and livelihood	-5	-3	-5	-5	-18

Table 4 presents individual and total scores for each impact, against the four attributes. The total scores are pointers for project implementers, to pay particular attention to those impacts with high total scores.

Negative impacts with a total score of less than -5 are considered severe and hence require serious attention. All the impacts such as loss of graveyards and loss of land and property, in the planning and design, stage require serious attention.

The main significant positive impact during construction is employment opportunity. Significant negative impacts include spread of diseases, loss of indigenous vegetation, and disruption of electric power and telephone services. As observed from Table 4, many of the significant negative impacts occur during the construction stage. Hence close monitoring of the EMP is highly recommended in this stage. All impacts with scores of less than -5 are considered to be severe and therefore require serious attention.

During operation, high scores for the positive impacts are in relation to increase in development (16). Significant negative impacts are related to loss of indigenous vegetation (-10), increase in road accidents (-12) and wastes from contractor's demobilization (-10).

6.3 IDENTIFICATION, ASSESSMENT AND EVALUATION OF IMPACTS

6.3.1 Impact Prediction and Determination of Mitigation Measures

The construction of N13 road, bridges, box culverts and ancillary roads will have various positive impacts stemming from improved public transport infrastructure and the creation of employment and business opportunities. Project implementation (design, construction and operation) will create employment and business opportunities.

Identifying Environmental Issues

In this study, we identified environmental issues and problems along the road alignment and made reasoned assessment of possible mitigation or rehabilitation measures. We have used a descriptive rather than a numerical rating to differentiate between more and less important impacts and to highlight priorities.

From a theoretical standpoint, the following considerations are important:

- Possible impacts of the proposed improvements as major determinants for evaluating degree of influence and determining project approval rating;
- Planning mitigation strategies;
- Selection of impact parameters, which normally include probabilities, time frames and impact magnitude;
- Effects on the local human environment;
- Relevance of biological resources; and

- Special treatment of significant impacts.

These among others have formed the basis of our evaluation.

The cost of implementing the mitigating measures recommended will be included under normal construction costs in works items.

Significant potential impacts, predicted according to the project phases; and mitigation measures developed through stakeholder involvement and professional judgment are as follows:

6.3.2 Impacts on The Biophysical Environment

6.3.2.1 Impacts During Planning and Design Phase

Positive Impacts

Employment Opportunity

The planning and design phase provided employment to both international and local consultants; for carrying out topographic and geotechnical surveys, preparing feasibility studies and conducting preliminary environmental screening. The project will also provide employment opportunities for skilled and unskilled workers during construction phase.

Enhancement Measures

To enhance employment benefits to direct stakeholders, the project should employ as many local unskilled labourers as possible, during all the project stages.

Negative Impacts

Loss of Graveyards

40 Graves located close to the existing road may be affected to pave way for construction and improvement of the N13 road. Specific details of the graveyards such as relocation modalities and compensation values have been included in the Resettlement Action Plan that was prepared for the road.

Mitigation Measures:

Consult local communities and secure their consent on relocating the graveyards to an agreed alternative site.

Loss of Farm Land and Property

Construction of the road will result in loss of farm land and property such as dwelling houses and shops owned by the local communities within the project area. (ref. 5.4 this document)

Mitigation Measures

- Provide for adequate compensation for the lost land and property.
- Involve local leaders and affected persons during planning for the proposed project.

6.3.2.2 Impacts During Construction Phase

Positive Impacts

Employment Opportunity

Construction of N13 road will provide employment for both skilled and unskilled workers during construction phase to carry out earthworks.

Enhancement Measures

Employ as many people from the surrounding community as possible, during all the project stages.

Negative Impacts

Degradation of Air Quality

The construction phase will contribute to the degradation of air quality associated with the activities of roadwork (excavation operations), vehicle traffic on unpaved roads, clearing land for various purposes (construction of access roads, yards, movement of equipment, etc..) loading and unloading of land and construction materials, core preparation operation and application of bituminous pavement, operation of various engines and vehicles can cause increased emission of particles and dust, emissions of volatile organic compounds and gas combustion and particles into the atmosphere. We expect a local negative impact of medium to high intensity.

Mitigation

The following mitigation measures are recommended.

- Avoid installation sites in areas close to housing and infrastructure.
- In drier periods of the year additional measures must be adopted such as sprinkling water on the roads, controlled movement of machinery and other places where there is high dust generation.
- The vehicles and machinery used must be in good working order, complying with international standards governing the amount of gas transmitted by heavy vehicles.
- The concrete plant must practice restraint and avoid blowing dust and vegetation waste.
- Loading materials by vehicles should be performed carefully to avoid the dumping of soil and materials to paved areas, proceeding to fast removal/cleaning of material dropped accidentally.
- Access shall be kept clean, including the tires of heavy machinery and vehicles, as soon as possible and re-vegetated areas cleared or altered, including borrow pits.
- Control activities that involve the mobilization and transport of land during strong winds of 20-30 km / hour.

Noise Pollution

The main areas where noise pollution will occur are the construction areas. This will mainly occur during a certain period of time. The noise and vibration that will be generated during construction activities result from the use of equipment such as compressors, compactors, drills, jackhammers, cement mixers and heavy vehicles. A negative impact can be minimized if properly mitigated.

Mitigation

Noise pollution can be mitigated as follows:

- Better routes for transporting equipment and materials from and to the yard and other service areas should be chosen. These routes would avoid most of the inside road passages from residential areas.
- Ensure that equipment and construction methods that are used cause the least possible noise. Use of appropriate and well maintained noise mufflers on vehicles and

machinery. The equipment used should be well maintained and that maintenance occurs within the acceptable parameters of their manufacturers and the law.

- Maintenance and periodic review should be conducted on all machinery and vehicles used in order to maintain normal operating conditions and compliance with standards on the emission of noise and vibration.
- Ensure that the noisiest operations performed near the vicinity of houses and other places of sensitive receptors are restricted to the daytime.
- Schools, hospitals and other noise sensitive areas should be contacted before commencement of construction activities. Some excessively noisy activities should take place outside normal school hours.
- Public notification of programmed loud activities.

Degradation of Water Resources

Water Pollution

There are several streams flowing in the south-westerly direction. At least ten rivers over which the road crosses, have significant flows which are of social and economic value to communities in the area. Water supply to settlements in the project area comes from wells, but the rivers are widely used for domestic as well as irrigation purposes. The risk of polluting surface and ground water through uncontrolled disposal of wastes and improper handling of pollutants (gasoline, diesel, oil and lubricants) can be real.

Dumping of various types of wastes into streams and valleys can cause serious pollution of fresh water sources on which rural populations rely. Pollution of streams could also occur through the deliberate or unconscious spills of oil, fuel, or cement slurry into side ditches, and on to waterways. The environment in the project area is reasonably well preserved and water flowing along some of the natural channels is still ample as seen in Photograph below.

Water Source and Vegetation on the N13 Road

Spills are likely to occur at the following locations:

- Contractor's vehicle and plant yards;
- Clearing adjacent to parts of the road where construction activities are in progress;
- Temporary accesses near riverbanks or valleys; and
- Bridge and culvert sites.

In hilly areas in the road section Mandimba-Lichinga., rainwater can drag up sediment that can reach the water lines thus affecting the quality of surface waters. This is a temporary impact of low to medium intensity, depending on the sensitivity of the area. However, wastewater generated from concrete processing plants, cleaning machinery, construction sites and camps may be responsible for significant changes in the quality of water sources if discharged directly into these waters without prior treatment, resulting in significant negative impact.

Mitigation

Spillage during construction is a common problem at works sites. Strict guiding rules should be laid down in the specifications to control spillage so as to avoid or reduce this impact. Direction should also be given for cleaning the more dangerous types of spills.

The following guidelines should be adhered to.

- The flow of muddy waters or contaminated water from the work areas (including washing waters) should not mix with any adjacent bodies of water or watering holes.
- Specific measures should be established to control wastewater and the contaminated site, including installation of special containers for storing contaminated water (especially water contaminated by oil and hazardous substances).
- Camps must have sanitary, sewage systems and sewage treatment.
- Water containing pollutants such as cement, concrete, lime, chemicals and fuel must be discharged into a tank for later removal off the site. This applies particularly to water that is used for concrete, it should in no way be discharged into the sewer system of the villages.
- Oils, lubricants, paints, glues and resins used should be stored in appropriate containers and sealed for later transmission to the appropriate destination, preferably for recyclying.
- Oil changes of vehicles and machinery should only be undertaken at designated locations that handle fuels and lubricants.
- These areas should be properly sealed off and equipped with methods to recover the oil.
- The storage area for vehicles must be drained to an isolated retention basin that is sealed off from the natural drainage network so as to prevent accidental spills of fuels and oils from contaminating the soil and water resources in the environment. The retention basin must have an oil separator.
- In the case of excavating contaminated materials, they must be stored in a place that does not allow contamination of drainage lines, even during the occurrence of rain.

Degradation of Soils

Soil Erosion

Impact

When slopes and road shoulders are stripped of vegetation cover road embankments themselves become susceptible to erosion. In cases where natural waterways are blocked by debris or other causes, erosion tends to occur as the flow of water finds an outlet by eroding the soil in its path. Evidence of this can be seen at edges of unlined drains along the road and at culvert outlets and some of the borrow areas. At roadway edges and on

road pavements, erosion of the road material also occurs when side drains overflow and spill their contents into the roadway, through which they carve trenches. The effect of this is more remarked in un-surfaced sections of the roads. This action has a low to high intensity impact.

Mitigation

This impact would be reduced by re-instating and providing more durable side drains and downspouts as recommended in the case of storm runoffs, but this particular situation would require the complementary measure of providing slope protection to embankments and culvert inlets and outlets, including grassing, stone pitching and laying of gabion mattresses in the more serious cases.

Runoff

Impact

The road crosses seven rivers. With the high annual rainfall in the area, runoff is high, and so is the risk of erosion. Preventive action to reduce this risk is vital for the protection of landscape. There is evidence of the negative impact of floodwaters on the terrain in a number of areas along the route. Erosion of the soil has occurred in embankments, road shoulders and at foundations of structures. Erosion is also pronounced where side drains are either non-existent, or eliminated by debris and soil washed down from the side slopes of cuts. Where adequate provision is not made to contain runoffs in well-designed drains and channels, erosion will continue to be a feature in the rainy months of the year, and can lead to the complete destruction of the road pavement. Runoff effects could also develop in areas such as, access roads, borrow areas and quarries. Controlling runoffs and preserving the soil are complimentary measures, and these are reflected in our recommendations.

Mitigation

The roadside drains and cross drainage structures require proper checks to determine their sufficiency to effect the proper collection of water from the roadway and adjacent terrain and carry it away from the road elements. Efficient drains would reduce or eliminate negative impacts, principally erosion, arising from catchments runoff. In certain situations downspouts could be laid down embankments to take runoff to natural watercourses. In other situations flood basins could be constructed at low points in the road corridor to collect surface runoffs and so create a positive impact from the construction. This would provide local dwellers with water for use during the dry season. For this project it is proposed to seal the road shoulders in order to provide protection from erosion caused by

storm runoffs, and re-shape or provide side drains of adequate size and gradient in keeping with standard design guidelines.

Soil Pollution

Impact

As in the case of rivers, soil pollution can occur at construction sites when there are spills of fuel, oil, chemicals, or cement. Indiscriminate disposal of these and other waste products in the project environs can damage the soil and make areas of the road corridor so affected unresponsive to the development of vegetation cover, landscape reclamation or agricultural activity.

Mitigation

Guidelines have been proposed in the ESMP for the protection of the soil from such pollutants, including the construction of approved pits or portable chemical waste containers to remove noxious chemical waste from the site. Such facilities should be cleared or re-instated at the end of the construction period. Mitigation measures include:

- Ensure that the main site for manufacturing materials is in the correct location to camps and sites, fuel supplies and construction materials that are extracted (gravel pits, quarries, etc.,).
- Avoid areas susceptible to soil and water contamination.
- All vehicle maintenance and the maintenance of other machines will be conducted in a sealed area of the site. Byproducts from the operation will be stored in watertight containers and then sent away for final disposal, preferably to be used for recycling.
- The storage area for materials and vehicles must be sealed and isolated from the natural drainage system to prevent accidental spillage of fuels and oils from soil and water contamination.
- The retention basin must have an oil separator, in case of accidental spills that could contaminate the area. Substances should be collected immediately and soils that have been exposed to contamination should either be cleaned or completely removed and transported to a secure location where their impact is minimal or null.

Geomorphology

Natural Land Features

The project area falls between the middle lowlands and the upland plateau relief. The landscape of both relief types is characterized by gentle residual hills.

New cuts through the slopes are not anticipated and no temporary road works are envisaged which will threaten the geomorphology. However, features such as pits at contractors' site, quarries and borrow pits could present drainage and other environmental problems like erosion and public safety, and these should be avoided or comply with ANE Guideline for Roads.

Spoil Dumps

Impact

Disposal of material unsuitable for construction or condemned for other reasons are normally carted to spoil dumps. These sites often stand out as a sore feature in the landscape and disturb the geomorphology of the area on which they are imposed.

These dumps could interrupt drainage, increase erosion and affect the aesthetics of the terrain. These also have the capacity of disrupting the subtle balance of land features created by nature.

Mitigation

During construction, attention should be drawn to guidelines in the Specification, for temporary storage of unwanted material. Suggestions have been made in Appendix I for strengthening the specifications in the works contract so that they cover specific aspects of dumping, and reduce any undesirable impacts associated with the practice.

Vegetation

The existing edition of cadastral map of the area, classifies much of the areas away from the road as forest zones. The vegetation in the area is characterized by woodland. In some areas, agricultural land has replaced woodlands. A large part of the wooded area is exploited for timber and firewood. However, indiscriminate cutting could result in extinction of many species of commercial plants, such as *Clappertonia Ficifolia*, and medicinal plants and wild fruits, such as *Cnestis ferrugina* . Certain sections of the land off

the roadway, are partly degraded, due to constant use in tuber cropping and early dry season bush fires.

Differences in ecological status have strong bearings with population densities and land use near built-up areas. Larger settlements like Cuamba and Mandimba have much depleted vegetation and grassy regimes have started to show dominance.
The implementation of the project could cause an increase in human activity in the area and thereby hinder efforts at vegetal preservation.

Impact

Disturbance of the vegetation cover could result in further erosion of the soil surface and the risk to the disappearance of this cover and to the destruction of the natural environment. This should be reduced or eliminated where possible. The risk is also real during construction of base camps for the Contractor's operations, and at borrow areas and quarry sites. This situation will not only cause erosion of the soil, but could lead to loss of plant species and the introduction of unfavourable conditions for the survival of other plants in the immediate vicinity of the project. Plants used by the local people for medicinal and diet purposes could be lost. Forest trees of economic importance could also be affected, and the beauty of the landscape altered or lost in some places.

The nature of the project is such that it will not involve any significant tree cutting or removal of vegetation in creating temporary diversions or land clearing for road re-alignments and access to Contractor's campsite, but care should be taken to minimise the risk.

Mitigation

Because the work to be undertaken is on an existing road, disturbance to the vegetation will be minimal and limited to the edge of the road, existing and new culvert locations, borrow pits and access to Contractors camp site where clearing and grubbing are expected. No direct or indirect impacts of the project on sensitive natural environments are expected. While it is unlikely that forest trees will be affected, any likelihood of this happening should be seriously assessed in order to limit the extent of tree cutting. Sensitive natural environments should also be identified in time to confirm that they would be avoided during construction.

Precaution should be exercised in clearing the vegetation as and when necessary, so as to preserve the terrain's natural cover as best as possible, especially in rocky habitats where the regeneration capacity of the flora is low. Where it is unavoidable to disturb the vegetation, damaged landscape should be replanted with indigenous plant species.

Loss and / or Disturbance of Vegetation and Habitats for Fauna

Impact

The terrain is awash with plant varieties. Local communities utilize some of these plants for medicinal and dietary purposes. Their removal will be a loss to the community. Wild and domesticated small ruminants rely on the rich bush and edible shrubs, which abound in the area. Some of them also serve as natural resource to local communities. No significant damage to plant and animal life is expected from the rehabilitation of the road, and no endangered species will be threatened, as most of the roadway activity will take place near the existing alignment.

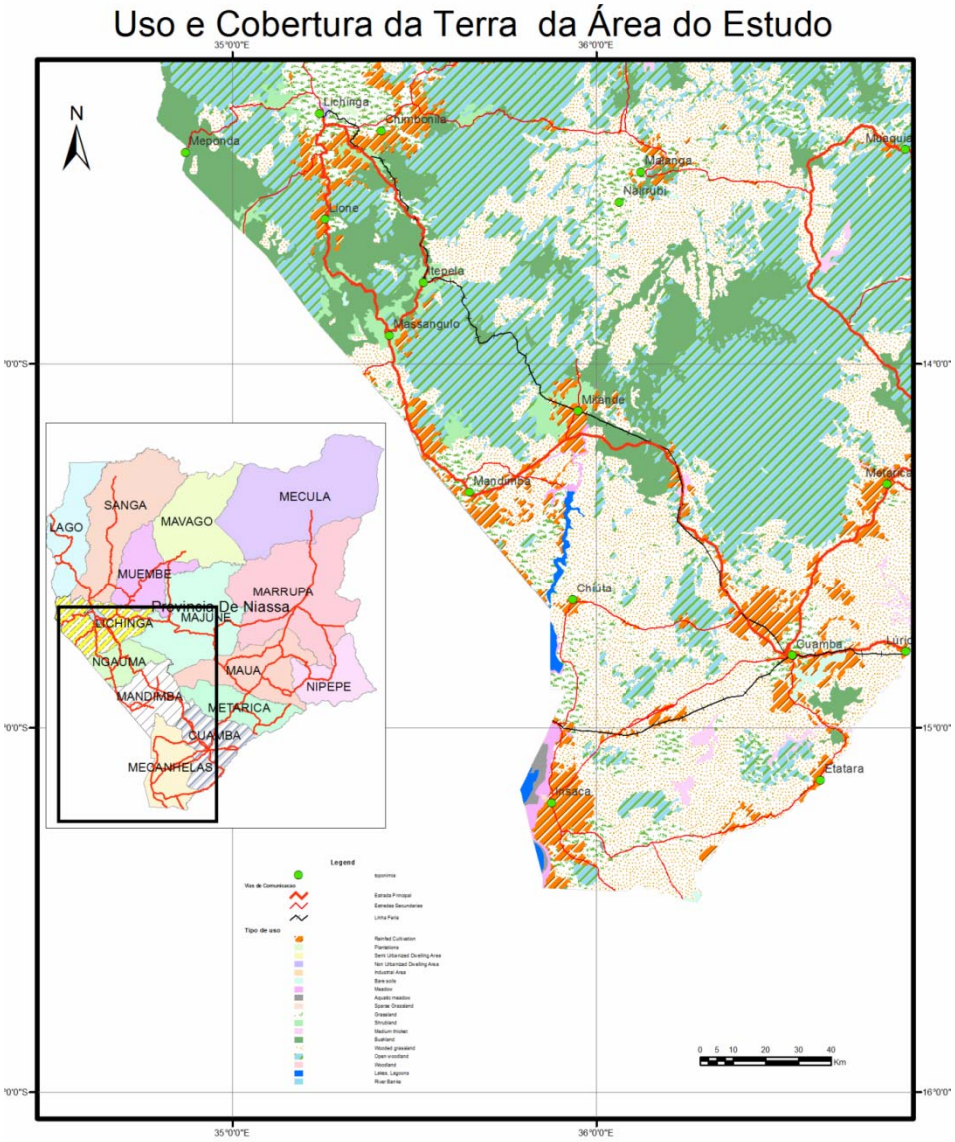


Fig. 10 Map of land distribution in Niassa Province and the Project Area

Clearing, cleaning and movement of land for road construction associated with construction and areas designated for construction materials (quarries, gravel pits materials storage areas for the work can lead to loss and/or disturbance of vegetation and habitats for fauna.

The fact that this rehabilitation project is on an already existing road minimizes this negative impact that normally results from road construction.

The project's workers will also put a strain on the availability of natural resources due to competition for wood, forest products and wildlife that could result in conflicts with the local communities. It is a low intensity negative impact.

Mitigation

Major re-alignments are not foreseen, but it is important to include in the works specification, provisions, which will avoid indiscriminate destruction of vegetation and habitats supporting animal or bird life.

- Construction should be conducted in places that have little or no vegetation and the service boundaries.
- The cleared areas shall be replanted with native vegetation to maintain the integrity of ecosystems as well as replanting of important species of flora along the route.
- Specific measures should be taken to prevent the spread of forest fires caused by project activities. Measures will include instruction for all employees about the risks of fire and awareness about the disturbance of vegetation.
- Road signs should be set up and speed humps constructed as mitigation for stray elephants. 6.3.3 Possible Social Impacts from Implementation of the Project

The following impacts have been considered in our analysis of the social implications of the implementation of the project:

Visual

Impact

Permanent or temporary features erected or created in the vicinity of the project can damage visual appreciation of the project. Structures of any description or any scaring of the landscape by actions forming part of the construction operations would impose a new visual image on the environment. The following features of the construction operation would result in negative visual impacts:

- Cut and fill
- New bridge structures
- Construction sheds
- Idle equipment.

Features, which enhance the aesthetics of the environment, make a positive impact, those, which detract from it, have a negative impact.

Mitigation

The extent of negative visual impact should be monitored during the design stage when structures and alignments will be conceived. It will be best to eliminate these at this stage with the cooperation of ANE so that only aesthetically pleasing designs will be incorporated into the project. During the const ruction phase, care should be taken to keep scars to the landscape, such as, borrow areas, quarry sites, contractor's campsite, high fills and deep cuts, as few as possible.

Acoustic

Impact

This impact will arise from an increase in ambient noise levels due to increased activity in the immediate vicinity of the project, such as movement of heavy construction machinery, blasting at quarry sites and during excavations, erection of plant and sounds of all types from construction crew. At settlements closer to the road or through which the road passes, the impact will be great. However, much of the noise will be temporary, occurring during the construction period. Some will be permanent, as road traffic increases on the improved road. High noise levels can also adversely affect certain classes of domestic animals and they also deserve consideration.

Mitigation

It is believed that the impact of noise on domestic animal will be minimal. Residential accommodation sensitively near road junctions, particularly at Mandimba, spreads out from the existing road edge. Stress levels resulting from noise could be significant in those areas. Action is recommended to keep this impact within tolerable limits, by limiting the use of some types of equipment to the minimum, and outside recognized quiet periods.

Exhaust Fumes

Impact

Exhaust fumes emanating from vehicles will increase during construction of the road. The greatest contribution will come from the operation of construction plant on site and operation of passenger and goods vehicles of all classes along the road. On completion of the rehabilitation, more vehicles will be attracted to use the facility and so cause air pollution to a degree greater than that currently experienced. The fumes from construction vehicles will have an impact for the duration of the construction, but those from other categories of vehicles will be permanent. It is expected that even the permanent

contribution will reduce over time as the Government gradually imposes emission controls on imported second-hand vehicles, which currently emits large amounts of polluting gases in the air.

Mitigation

Increased fumes in the atmosphere will affect residences in the vicinity of the project. Noxious emissions of the kind released from vehicles can cause serious health hazard to the communities in the vicinity. To keep this impact within tolerable limits, the use of some types of construction equipment should be limited or avoided. Heavy and noisy equipment should be routed away from populated areas and scheduled maintenance of construction vehicles should be strictly adhered to, in order to keep them running efficiently with less noxious gas emissions.

Other actions will be required by Government traffic control authorities to address the wider problem of keeping vehicles with high emission levels out of the nation's highways.

Dust

Impact

Air pollution is expected during construction. This will be caused by dust from the operation of heavy equipment during earthworks activities, especially in the unpaved section of the road. Dust clouds will be a traffic security hazard for motorists and pedestrians. The situation could be made more acute by wind in areas where earth moving will be intense. Combined with the incidence of air pollution from exhaust gases, and evaporation from fuel tanks and vehicle carburetors, there could be real risks to road-users' health.

Mitigation

Measures for dust settling such as soil watering will be applied during construction. Traffic in the vicinity of the construction should be regulated to ensure security for passing vehicles and pedestrians.

Smoke and Fires

Impact

In addition to other air pollutants, smoke resulting from fires can be expected to present negative impact in the same way as dust. With increased action on the works site during construction, fires may occur from time to time during construction. The risk of fires can be high particularly during the dry months of the year. The possible damage will be to

farmlands, and vegetation in the vicinity of the project area. The damage may even spread to nearby villages causing destruction of houses and crops.

Mitigation

The Contractor should avoid the burning of wastes of any kind as precaution against the outbreak of fires. Open fires shoud be kept to a minimum, and where utilized they should always be secured by the implementation of adequate protective measures to avoid the spread of fires.

Social Dislocation

From Increased Traffic

Impact

Traffic diversions during road construction, can cause social dislocation in settlements through which diversions are routed, and in some cases among road users. It is not expected that there will cause serious conflict among road users, or between road users and the Contractor's works team controlling traffic movement on site. There is a possibility of difficulties arising from bad sign posting or regulation of traffic flows though normally quiet settlements and at junctions. In any of these situations volumes are not expected to be such as to result in problems that cannot be overcome. There will be added risks which communities will be exposed to when workers from outside the district are recruited. Such risks related to health and security should be given consideration in any mitigation plan. .

Mitigation

Effective management of diversions should be instituted, and this should be reflected in the specifications. Walkways and temporary traffic controls should be provided in accordance with specific guidelines for design and operation, all to be detailed in the works contract documents. Health and Security matters, which may affect neighboring communities, should be discussed and agreed at pre-contract meetings arranged by the Contractor. Proposals for avoiding health and security hazards should be coordinated with relevant national organizations. Residents should be given regular briefings on activities, which will impact on their lives.

From Increased Risk to Health and Security

Impact

The implementation of the project may result in impacts, which might prove inimical to the health of the communities within the zone of influence of the project. In particular, the recruitment of labour outside of the project area will have the potential of bringing into the community, communicable diseases through contact of affected staff with inhabitants of the area who might otherwise have remained unaffected by such diseases. On the other hand, there is the likelihood that labor from outside the area may be susceptible to certain infections already endemic to the area. In this case this situation is unlikely. It is nevertheless important, to assess health risks from the project implementation in order to develop strategies to minimize this particular impact on the communities.

Of major health concern is the risk of spreading HIV infection more widely than obtains at the present time. It is known that there is national and regional concern over the incidence of HIV and AIDS among the working population. Opportunities for work in the project location will unwittingly attract workers who might have this infection previously to seeking employment in the area. Free movement of such workers within these communities and the inevitable social contact, which may result with individuals in these communities, will promote the spread of the disease if measures were not put in place to inhibit its spread.

In addition to health risks there is the risk of attracting undesirable elements as casual workers from the immediate vicinity of the project area. Such employees might be recruited without proper checks on their criminal records. Their presence might result in untold mischief and violence.

Mitigation

With respect to health measures the Contractor and the Engineer's Supervisory Team prior to the start of construction should address the issue of health risks from transmittable diseases and such as HIV as well as security risks. In connection with AIDS prevention, an AIDS prevention programme should be developed in consultation with ANE. This should include the provision of on-site medical unit manned by a qualified health officer, to give advice on prevention, as well as undertake the following activities.

- Install posters and other graphic displays dealing with HIV prevention throughout the work site;

- Arrange for facilities for voluntary AIDS screening on a monthly basis;
- Conduct counseling and health education sessions for all workers; and
- Arrange for referrals of known or discovered AIDS cases to appropriate health centres for further advice and treatment as appropriate.

The Resident Engineer will be responsible for the implementation of the mitigation programme and will utilise standard monitoring techniques to assess the level of reception and the impact of specific target groups within the workforce and the zone of influence of the project. The AIDS mitigation activities will be at the core of the Environmental Monitoring Plan, and progress of the mitigation monitoring will be an agenda item at the monthly site meetings.

With respect to security, the Contractor should endeavor to obtain police clearance for potential employees from outside the immediate vicinity of the project before recruitment. In addition, the local police and community leaders should be consulted and periodically apprised of any situation, which might have the potential of resulting in violence or uncontrollable anti-social behavior.

Loss of Access to Land and Areas of Interest

There will be some temporary and permanent lands used for the project that would affect the local communities.
Mostly affected will be street vendors, who usually sell their products along the embankment of the road. They will have to cease their activities at those locations and find other areas to sell their goods.
Some of these vendors have built simple 1m -2m wooden stalls, they too must be temporarily moved to other locations. This negative impact is to have moderate to significant repercussion, regardless of mitigation measures implemented.

Mitigation

A prepared resettlement and compensation plan should be in place for the infrastructure and the assets affected. The resettlement process should be monitored and measures should be in place for that

Dissemination of information to all affected and interested parties is crucial. The implementation of the Resettlement Action Plan (RAP) is based on the World Bank guidelines on involuntary resettlement.

Communities and authorities should be given 5 days advance notice for work planed at a specific location.

Alternative routes cannot be blocked or in poor driving conditions allowing normal use of them by the communities directly and indirectly affected.

Impact on Road Safety

The traffic of machines and vehicles related to the execution of the roadwork will increase the risk of accidents involving pedestrians.

The existence of unmarked areas or signage and/or poor lighting may endanger the movement of vehicles and pedestrians, as well as public safety and health. This is a negative impact albeit of low frequency but of high significance.

Mitigation

All work areas should have first aid equipment, in the event of an accident, victims should be transported in the safest and most sanitary vehicle that is at the scene of the accident
The company will cover the cost of health care and assume immediate liability.

The contractor shall flag all places of work, and movement of vehicles regulated by the flag bearers.

The speed limit should be 50 km/hour in district capitals, as well as locations with large settlements.

Impacts on Cultural Heritage

Sacred sites have been identified within the limits of the roadwork most of them are cemeteries. The rehabilitation of the road may have a negative impact if the sites are displaced due to security reasons when people visit them for conducting ceremonies. These cultural heritage sites are of great importance to local populations, so their resettlement would be of significant impact.

Mitigation

During the design phase and subsequent construction phase, every effort should be made to prevent the removal of sacred sites located along the road.

On the impossibility of preventing the movement of sacred sites and/or cemeteries, families affected should be provided sufficient time and resources to undertake and the traditional ceremonies necessary.

Possible Economic Impacts

Economic impacts are expected to be felt from changes in the pattern of economic activity in the area. The following are activities likely to be affected:

Productive Activity
This project will have an impact that will be temporary for some activities, and permanent for others. The following groups will be affected:

Among outcomes constituting temporary impacts are:

- The employment of temporary construction workers recruited from towns and villages in the vicinity of the project;
- Business opportunities for petty traders dealing with consumer goods and having an enlarged clientele or new outlet for their wares among construction workers;
- Openings for trading enterprises catering for ready-to-eat foodstuffs;

Among outcomes constituting a permanent impact is:
Business expansion for farming communities, which will have faster, safer and more comfortable transportation on an improved road access to market centres, and to cross-border trading stations and outposts.

Resource Development

Impact
Because of the last civil war and economic advantages many settlements have been established closer to the road than farther from it over the years. Rehabilitation of the road will have positive impacts on socio-economic activities that will outweigh the negative. If the trend to settle along the roadside continues, an improved condition of the road could result in increased roadside development, as access to public transport increases and travel times to get to markets and social services increase.

Further impact of a positive nature will come from value-added effects on land and buildings in areas of the road's influence. Improvement in area status would also occur. However, improved access to some communities could increase the residential population and change the character of those communities.

Transportation

As has been discussed earlier, rehabilitation of the road will have a positive impact on the transportation sector by increasing accessibility, reducing travel time, increasing the frequency of public transport to the area, increasing trade between the areas of high production and low production, and reducing transport cost of farm produce and goods.

A negative impact will be road insecurity, increase in road accidents resulting from an increase in the number of vehicles on the road.

Mitigation

The economic impact from resource developments can be positive, and is therefore endorsed. Making existing access roads to settlements further from the main road easily identifiable, by improving road junctions and incorporating bus stops in the road design, could strengthen the positive impacts of the project. Migration of population into some locations is bound to occur as people find that travelling to destinations with economic potential is no longer inconvenient and hazardous. This trend will have its negative consequences for the environment

Measures to reduce the negative effects of these developments should include monitoring of land use patterns and environmental lapses in the community.

Community Expectations of Social, Cultural and Economic Benefits from the Proposed Rehabilitation of the Road

Three significant benefits were deduced from the survey. The largest percentage of respondents (35.6%) believed that the rehabilitated road would increase the volume trade in the area (Table 12). The next largest percentage of respondents 21.5% felt that business would be more brisk than at present inspective of volume. The third largest percentage expected transportation of goods to improve. Other response figures range form 6.8% for safer roads, 5.5% for faster commuting, Percentage for more job opportunities and cheaper travel costs.

Impact on The Biophysical Environment, Operation and Maintenance Phase

Employment opportunities

It is hoped that the operation and maintenance of the road will be made by companies that continue to engage local workers to continue the increase of employment opportunities, which are scarce in the region.

The improved road will also increase employment opportunities through the establishment of projects along the road and improving the local economy, making a positive impact of medium intensity with long term significance.

Improving Access to goods and Flow of Services

The rehabilitation of the road will improve the local population's access to public services (education, health, transport, etc.)

The improvement of the road will boost the government and NGO's incentive to invest in programs that increase infrastructure and social facilities, because it will be easier to transport construction, rehabilitation and / or maintenance materials.

This impact has a high significance and magnitude. The improved road will have indirect positive implications in improving the region's economy, allowing the possibility of exporting agricultural inputs and products, improving the conditions of transporting goods mostly to the districts traversed by the road. This action will consequently aid in the reduction of regional poverty.

Positive Endeavour

The provincial government should make efforts to rehabilitate feeder roads and side roads that cross the N13 in order to obtain greater returns on the project. This will stimulate rural trade that constitutes by providing access of farm products and industrial goods (wood, cotton etc.) to markets.

Rehabilitation should include the construction of public transport stops and rain shelters in the waiting areas.

Social Conflict

The operational phase of the road could increase the number of people in settlements located along the road and cause social conflicts. These conflicts may be related to access and use of natural resources, employment and basic services, increased crime and prostitution. This is a likely impact of medium intensity and significance.

Mitigation

Social services such as schools, hospitals should increase based on the emerging needs. Awareness campaigns for HIV, AIDS and STIs should be spread through out local communities with the support of ANE in coordination with health authorities and the Commissions for Combating AIDS.

Impact on Health and Road Safety

During the operation phase, the risk of road accidents will increase due to excessive speed and/or the disregard of warning signs, especially in major centers with a concentrated population and schools along the road creating a negative impact of high significance.

Mitigation

Installation of speed limit signs, speed bumps to inform road users (vehicle users and pedestrians). Speed limits in appropriate locations to minimize the risk of accidents with pedestrians and cyclists. Informal traders (street vendors) should be discouraged from selling their goods on the edge of the rehabilitated road.

Regular maintenance activities of the road should be carried out in order to avoid dangerous conditions for road users.

6.4 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

The environmental and social management plan (ESMP) is presented in Table 6.1. The Table clearly shows the linkages between the predicted negative environmental and social impacts and recommended mitigation measures. It also shows the link between the recommended mitigation measures, the targets/goals/dates, the stakeholders responsible for implementation of the mitigation measures and the estimated cost. A detailed EMP is bound and submitted separately as an annex to this report.

TABLE 6-1A Environmental and Social Management Plan

NEGATIVE IMPACTS

Item	Potential Impact	Recommended Enhancement/Mitigation/Management Measure	Target/Goals/Dates	Responsibility for Implementation	Costs
PLANNING AND DESIGN					
1	Loss of graveyards	Consult local communities and secure their consent on relocating the graveyards to an agreed alternative site Implement graveyard relocation in consultation with the affected people.	Before construction works start	Consultant /Client /District Commissioner	As determined by the RAP
2	Loss of farm land and property	Provide for adequate compensation for the lost land and property. Involve local leaders and affected persons during planning for the proposed project.	Before construction works start	Client /District Commissioner	
CONSTRUCTION					
1	Air pollution	Service plant and vehicles regularly	Service and maintenance dates as recommended by dealers	Contractor	To be included in contractor's bills of quantities
		Spray water to suppress dust on dusty roads and surfaces, during earthworks	Spray water at least three times a day on busy roads and working areas	Contractor	To be included in contractor's bills of quantities
2	Soil contamination	Surface all vehicle servicing and fuel /oil storage areas with concrete or some appropriate impervious material to prevent contact of soil with the oils.	Immediately after construction starts	Contractor	To be included in contractor's bills of quantities
		Discard waste oil containers in approved disposal areas, as recommended by District Councils.	Throughout the construction phase	Contractor	N/A

Item	Potential Impact	Recommended Enhancement/Mitigation/Management Measure	Target/Goals/Dates	Responsibility for Implementation	Costs
3	Soil erosion	Backfill and compact excavated areas immediately after excavation to limit exposure of loose soils.	Immediately after excavation	Contractor	To be included in contractor's bills of quantities
		Construct retaining walls to enclose excavated loose soils and ground cuts with steep slopes.	Before excavation	Contractor	To be included in contractor's bills of quantities
		Plant grass and trees on excavated bare land.	Before or immediately after the rains following commencement of construction	Contractor	Costs covered in item 2
4	Noise and vibrations	Use appropriate and well maintained noise mufflers on vehicles and machinery	During equipment and vehicle specifications for purchase	Consultant	To be included in contractor's conditions of contract and pricing in the Preliminary and General Items
			Throughout the construction period	Contractor	
		Use electric motors instead of compressed air driven machinery.	During equipment and vehicle specifications for purchase	Consultant	
		Use plastic or rubber liners, noise control covers, and dampening plates and pads on large sheet metal surfaces.	During construction	Contractor	
		Limit the number of days of operation; restrict hours of operation and schedule noisy tasks for periods of low occupancy on the project surroundings	During construction	Contractor	
		Ensure that equipment is regularly maintained	During construction and operation	Contractor/ Client	
		Notify public of upcoming loud events.	Throughout the construction period	Contractor	
5	Loss of indigenous vegetation	Limit vegetation clearing only to areas required for construction.	Throughout the construction period	Contractor	N/A
		Hold awareness discussions with the employees and the contractor on preventing loss of trees and vegetation	Before construction works start	Contractor /Client	Costs covered in item 2

Item	Potential Impact	Recommended Enhancement/Mitigation/Management Measure	Target/Goals/Dates	Responsibility for Implementation	Costs
6	Loss of wildlife habitats	Limit vegetation clearing to only those areas required for construction	Throughout the construction period	Contractor	N/A
		Hold awareness discussions with the employees on preventing loss of wildlife habitats	Before construction starts	Contractor	Costs covered under item 2
7	Interruption of normal traffic flow	Provide detours and appropriate traffic signs for vehicles and pedestrians.	During entire construction period	Contractor	To be priced in contractor's Bills of Quantities
		Reinstate all excavated roads to original state	During entire construction period	Contractor	To be priced in contractor's Bills of Quantities
8	Disruption of electric power and telephone service	Locate existing services lines in consultation with institutions providing electricity and telephone services along the roads.	Throughout the construction period	Contractor	N/A
		Inform public in advance, where and when services have to be interrupted.	Throughout the construction period	Contractor	N/A
9	Spread of diseases	Conduct regular health check-ups, immunize and treat the workers.	Quarterly throughout construction	Contractor	40,000.00
		Conduct regular health including HIV and AIDS and STIs awareness campaigns for the work force and the community around the project area.	Quarterly throughout construction	Contractor	200,000.00
		Strengthening the capacity of the health institutions in the project area to meet the increasing demand for health services.	Before construction works start	Ministry if Health and Population	N/A
OPERATION					
1	Loss of jobs due to completion of construction works	Provide alternative employment to employees as operating staff	Once at the end of the construction works	Contractor	N/A
		Provide adequate notice to employees to prepare themselves and secure alternative employment	At least 3 months before termination of employment	Contractor	N/A
		Pay severance benefits to leaving workers in line with the labour regulations	At least one month before termination of employment	Contractor	N/A
2	Increase in road accidents	Provide speed regulating road signs in appropriate sites throughout the road from Cuamba to Mandimba	During operation	Client	N/A

Item	Potential Impact	Recommended Enhancement/Mitigation/Management Measure	Target/Goals/Dates	Responsibility for Implementation	Costs
3	Wastes from Contractor's Demobilization	Stockpile, transport and dispose of waste at a designated site. Demolish temporary toilets and plant trees as appropriate	Once during contractor's demobilization	Contractor	N/A
DECOMMISSIONING					
1	Loss of jobs, business and livelihood	Warn and prepare employees on the intentions to close the operations	At least six months before closure	Client	N/A

POSITIVE IMPACTS

Table 6-1b Environmental and Social Management Plan

Item	Potential Impact	Recommended Enhancement/Mitigation/Management Measure	Target/Goals/Dates	Responsibility for Implementation	Costs
PLANNING AND DESIGN					
1	Employment Opportunity	Employ as many local unskilled labourers as possible	Throughout project planning	Consultant /Client	To be covered in consultancy costs
CONSTRUCTION					
1	Employment opportunity	Employ as many local unskilled labourers as possible	During construction	Consultant	To be included in project bills of quantities by contractor
OPERATION					
1	Increase in Development	Ensure advocacy and public awareness of the project to investors interested in infrastructure development, industry, commerce and tourism	Annually	Client	US$50,000.00

Table 6-2 Summary of Costs For Enhancement And Mitigation Measures

Item	Recommended Enhancement/Mitigation/Management Measure	Costs (US$)
1	Conduct regular health check-ups, immunize and treat the workers.	40,000.00
	Conduct regular health including HIV and AIDS and STIs awareness campaigns for the work force and the community around the project area.	200,000.00
2	Advocacy and public awareness to investors interested in infrastructure development, industry, commerce and tourism	50,000.00
	Total for Environmental ans Social Management	**290,000.00**

6.5 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

6.5.1 Monitoring Plan

The environmental and social monitoring plan, presented Table 6.3, provides for monitoring to checking implementation of the mitigation measures proposed in the EMP. The monitoring plan gives monitoring indicators, means of their verification, frequency of monitoring and the stakeholders responsible for monitoring. The costs for carrying out the monitoring activities include travel expense and allowances to get to the project site and to monitor implementation of the EMP.

The environmental monitoring plan helps to verify the magnitude, duration and scope of the predicted impacts during and after implementing the mitigation measures. It also helps to detect any unforeseen impacts at an early stage so that corrective measures can be taken, before significant damage takes place on society or the environment. Hence monitoring implementation of the EMP requires dedication and persistent follow up, especially during the construction and operation phases of the project. It requires coordination with professionals from the various key stakeholders to verify that all mitigation measures in the EMP are being implemented on time and as recommended.

Environmental Monitoring

The following environmental monitoring plan is recommended for implementation during the construction phase of the project:

- An Environmental Monitoring Unit (EMU) should be set up consisting of:
- The Resident Engineer –Chairman;
- The Contractor's Agent;
- ANE Representative;
- Representative of the Ministry of Public Works, Plan and the Environment;
- One representative from each of the communities in the zone of influence of the project road.

The Unit should be charged with the responsibility of monitoring all environmental issues connected with the rehabilitation of the road and report directly to the Director General of ANE, the National Authorizing Officer, AfDB and JICA

In particular, the unit should carry out the following duties:

(viii) To ensure compliance with the Mitigation Plan (MP) as outlined in Appendix 1 and all legislation concerning environmental protection and improvement as well as the specific clauses relating to environmental matters included in the Contractor's contract;

(ix) To keep a register of compliance with the Plan for monthly inspection at EMU meetings including updating of the route plans showing tree planning, quarries and pits used with updated characteristics of each and location of erosion control devices in the drainage system;

(x) To record any violation of the MP and action taken to correct them;

(xi) To identify any new environmentally harmful situations arising during construction and recommend measures for immediate mitigation;

(xii) To carry out monthly physical inspection of the works to inspect environmental state of the works and any improvements implemented;

(xiii) To prepare a monthly environmental report for presentation at monthly site meetings and submission to the Director of Roads and;

(xiv) To make proposals for future maintenance studies which will outline specific arrangements for studying subsequent maintenance subsequent to the completion of the works. This should include tasks to be undertaken to improve the environment and comments or supplementary data regarding the state of quarries and the area drainage.

6.5.2 ESTIMATED ENVIRONMENTAL MONITORING COST

Costs for monitoring some of the recommended mitigation measures are not provided in Table 6.2 as it is assumed that some of this work will be part of normal responsibility of some government institutions. However, it is important to appreciate that the capacity of existing institutions may not be sufficient for the additional demand created by the project. Hence additional resources from the project will be required to satisfy some specific needs of the project and this has been provided for in the estimated costs for the monitoring plan summarized in Table 6.3.

Table 6.3 Environmental and Social Monitoring Plan and Estimated Costs

Item	Potential Impact	Recommended Enhancement/ Mitigation /Management Measure	Selected recommended monitoring indicators	Means of verification	Frequency of monitoring	Responsibility for Monitoring	Costs (US$)
IMPACTS DURING PLANNING AND DESIGN POSITIVE IMPACTS							
1	Employment Opportunity	Employ as many local unskilled labourers as possible	Number of Local people employed	Head count	Quarterly	Client Ministry of Labour	
NEGATIVE IMPACTS							
1	Loss of Graveyards	Consult local communities and secure their consent on relocating the graveyards to an agreed alternative site Implement graveyard relocation in consultation with people of GVH Matchokolisa area.	Percent of the affected community accepting graveyard relocation	Random interviews with the affected community	Throughout RAP preparation period	DC Client	
2	Loss of Farm Land and Property	Compensate communities according to RAP	Percent of affected persons compensated	Head count	Once before, during and after compensation	Client Consultant	
IMPACTS DURING CONSTRUCTION POSITIVE IMPACTS							
1	Employment Opportunity	Employ as many local unskilled labourers as possible, during all the project stages	Number of local people employed	Employment register	Quarterly during construction	Client Ministry of Labour	
NEGATIVE IMPACTS							
1	Disruption of	Relocate graveyard on	Number of	Complaints	Daily during	District Council/	N/A

Item	Potential Impact	Recommended Enhancement/ Mitigation /Management Measure	Selected recommended monitoring indicators	Means of verification	Frequency of monitoring	Responsibility for Monitoring	Costs (US$)
	Graveyard	time and in consultation with affected community	complaints on graveyard relocation process	register	graveyard relocation	Client	
2	Air Pollution	Service plant and vehicles regular	Vehicle service records	Inspection	Quarterly during construction	Client MICOA	
		Spray water to suppress dust on dusty roads and surfaces, during earthworks	Number of complaints from community	Random interviews			
3							
4	Soil Contamination	Surface all vehicle servicing and fuel /oil storage areas with concrete or some appropriate impervious material to prevent contact of soil with the oils.	Areas contaminated with oils	Visual inspection and measurement	Quarterly during construction	Client MICOA	Covered in 3
		Discard waste oil containers in approved disposal areas, as recommended by M'mbelwa District Council.	Areas littered with waste oil containers				
5	Soil erosion	Backfill and compact excavated areas immediately after excavation to limit exposure of loose soils.	Excavated areas	Visual inspection	Quarterly during construction	Client MICOA	Covered in 3
		Construct retaining walls to enclose	Retaining walls				

Item	Potential Impact	Recommended Enhancement/ Mitigation /Management Measure	Selected recommended monitoring indicators	Means of verification	Frequency of monitoring	Responsibility for Monitoring	Costs (US$)
		excavated loose soils and ground cuts with steep slopes.					
		Plant grass and trees on excavated bare land.	Percent of area planted with trees and grass	Site inspection and measurement	Once before and once after planting	Client Department of Forestry	Covered in 2
6	Noise and vibrations	Use appropriate and well maintained noise mufflers on vehicles and machinery;	Number of complaints During construction	Random site inspections and interviews	Quarterly during construction	Client Ministry of Labour	Covered in 1
		Use electric motors instead of compressed air driven machinery.					
		Reduce noise by using plastic or rubber liners, noise control covers, and dampening plates and pads on large sheet metal surfaces.					
		Limit the number of days of operation; restrict hours of operation and schedule noisy tasks for periods of low occupancy on the project surroundings					
		Ensure that equipment is regularly maintained					

Item	Potential Impact	Recommended Enhancement/ Mitigation /Management Measure	Selected recommended monitoring indicators	Means of verification	Frequency of monitoring	Responsibility for Monitoring	Costs (US$)
		Notify the public of upcoming loud events.	Number of notices sent	Inspection of records			
7	Loss of indigenous vegetation	Limit vegetation clearing only to areas required for construction.	Percent of project area cleared of vegetation	Site inspection and measurement	Quarterly including Once before and once after planting	Client Department of Forestry	Covered in 1
		Hold awareness discussions with employees and contractor on preventing loss of vegetation	Number of meetings held	Random interviews			
8	Loss of wildlife habitats	Limit vegetation clearing to only those areas required for construction	Percent of project area cleared of vegetation	Site inspection and measurement	Quarterly during construction	Client Department of Parks and wildlife Department of Forestry	Covered in 1
		Hold Awareness discussions with the employees on preventing loss of wildlife habitats	Minutes or record of meetings held	Inspection			
9	Interruption of normal traffic flow	Provide detours and appropriate traffic signs for vehicles and pedestrians.	Number of complaints from motorists	Random interviews	Monthly	Client; District Commissioner Roads Authority	N/A
		Reinstate all excavated roads to original state	Number of un-reinstated places compared with total excavated	Site inspection and measurement	Quarterly during construction		
10	Disruption of electric power and telephone	Locate existing services lines in consultation with institutions	Plans verified or checked by services providers	Inspection of approved plans	Once before commencement of construction	Client District Commissioner	

Item	Potential Impact	Recommended Enhancement/ Mitigation /Management Measure	Selected recommended monitoring indicators	Means of verification	Frequency of monitoring	Responsibility for Monitoring	Costs (US$)
	service	providing electricity and telephone services.					
		Inform public in advance, where and when services have to be interrupted.	Letter or record of information	Inspection of records or letters			
11	Spread of Diseases	• Conduct regular health check-ups • Immunize and treat the workers.	Health records	Inspection of records or letters	Annually	Ministry responsible for labour	N/A
IMPACTS DURING OPERATION POSITIVE IMPACTS							
1	Increase in Development	Ensure advocacy and public awareness of the project to investors interested in infrastructure development, industry, commerce and tourism	Number of awareness meetings	Inspection of records and random interviews	Annually	Client	N/A
NEGATIVE IMPACTS							
1	Loss of indigenous vegetation	Provide environmental awareness training to all employees and the community to protect vegetation.	Number of people trained in environmental awareness and management	Inspection of training records	Annually	Client; District Forestry Officer	50,000
		Provide alternative energy sources to wood for cooking.	Number of people using alternative energy sources	Random interviews			
		Use alternative building materials.	Number using alternative materials (iron sheets and steel	Random inspections and interviews			

Item	Potential Impact	Recommended Enhancement/ Mitigation /Management Measure	Selected recommended monitoring indicators	Means of verification	Frequency of monitoring	Responsibility for Monitoring	Costs (US$)
			windows etc.)				
2	Loss of jobs due to completion of construction works	Provide alternative employment to employees as operating staff	Number of people working on construction retained as operating staff	Employment register and head count	At the end of construction	Ministry of Labour	N/A
		Provide adequate notice to employees to prepare themselves and secure alternative employment	Time termination notices are give as indicated on conditions of employment	Employment records	Once at least one month before end of construction phase	Ministry of Labour	N/A
		Pay severance benefits to leaving workers in line with the labour regulations	Number of complaints against terminal benefits	Employment records	Once at least one month before end of construction phase	Ministry of Labour	N/A
3	Wastes from contractor's demobilization	Stockpile, transport and dispose of waste at a designated site. Demolish temporary toilets and plant trees as appropriate	Quantity of waste and number of abandoned structure or property	Site inspection	Twice within two months after construction	Client Consultant	N/A
IMPACTS DURING DECOMMISSIONING							
NEGATIVE IMPACTS							
1	Loss of jobs, business and livelihood	Warn and prepare employees on the intentions to close the operations	Record of meetings and letters	Inspection of records and random interviews	Quarterly	Client; Ministry of Labour	

7 PUBLIC CONSULTATION

The striking commentary on the project was that it would yield enormous social and economic benefits especially in creating jobs. No reaction was obtained about the threat to the environment. However, consultation with groups in the districts, indicated that many of them saw the impending improvements to the road as one of minor threat to the environment, since the road has existed and its physical state has been a feature in the environment for a considerable length of time. Its rehabilitation under the project's Terms of Reference will not constitute any perceptible departure from the existing accommodation already established between nearby communities and the existing road facility. The rehabilitation of the road will in fact result in improvements ranging from better access to major towns in the province, and increased social and economic activities. There are possible short-term dislocations such as has been observed in the report in the social fabric of the communities, such as the spread of infection, prostitution and increase in the crime level in the area. These and other negative impacts, it is believed, will be minimised if there were an awareness of the risks. Relevant community programs, could also provide additional safeguards. if initiated prior to the start of construction

8 CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

There is need for upgrading of trunk roads from Nampula – Cuamba – Mandimba - Lichinga (the Nacala Corridor) in order to improve access that currently hinders economic development in Niassa province. This follows the fact that the existing road has extensive potholes, ruts and corrugations; causing discomfort to users and making driving dangerous. This is well understood by stakeholders and especially the Cuamba, Mandimba, Ngauma and Lichinga District Councils.

Implementation of the proposed project activities will have both positive and negative impacts on the socioeconomic environment.

Main Positive Impacts

The significant positive impacts, with a total score of more than 10, include:

- employment opportunity; and
- increase in development.

Main Negative Impacts and their Mitigation Measures

Significant negative impacts, with total scores lower than negative ten (-10); and their proposed mitigation measures are as follows:

Impact: Disruption of Graveyard

Mitigation Measures

Relocate graveyard on time, in consultation with the affected community, the District Commissioners and officers from the Department of Lands. The Ministry of Health will have to be contacted for their advice on health and protective measures.

Impact: Destruction of crops and farm land

Mitigation Measures

Compensate for lost crops in line with recommendations of the RAP and in consultation with the affected community

Impact: Loss of indigenous vegetation

Mitigation Measures

As a mitigation measure, vegetation clearing should be limited only to areas required for construction. Awareness discussions should be held with the employees and the contractor in this respect.

Impact: Increase in Road Accidents

Road accidents will increase during the operation phase as a result of the increase in traffic and increased speed of vehicles.

Mitigation Measures

Provide speed regulating road signs in appropriate sites throughout the road from Cuamba to Mandimba

In general, the impact analysis shows that the project will, in the long term, have significant environmental and social benefits to the community due to the improved access to basic services and in turn trigger economic development in Niassa Province.

On the other hand, the negative social impacts of loss of land can significantly and adversely affect the communities if the mitigation measures are not effectively implemented in accordance with the EMP and the RAP prepared separately.

The EMP primarily aims to effectively and efficiently address the potential negative impacts through implementation of the proposed mitigation measures. The RAP will provide a detailed and systematic plan for land acquisition and compensation.

7.2 Recommendations

Based on the results of this ESIA study and observations made above, the following recommendations are made.

- The mitigation measures recommended in this report should be fully implemented to avoid or maintain the predicted negative impacts at the lowest level. In particular, the impacts outline in the conclusion should be given full attention;
- All the impacts requiring engineering solution and contract management have to be incorporated in the detailed design and specification for the construction works;
- Planning and consultation on land acquisition and compensation must continue with full participation of the affected community and consensus must be reached with the community prior to land acquisition and compensation. The Department of Lands, the Client and the affected Communities must participate in these consultations, lead by the Client or his consultant;
- All land acquisition and compensation activities must follow the recommendations in this report and the RAP;
- Costs of mitigation measures, to be borne in the construction process must be included in the civil works tender documents;

- The compensation process will be handled through the office of District Commissioners, in such a way that it will not hinder the performance of the project;
- The affected people shall be adequately and fairly compensated, in line with the recommendations in the RAP;
- Appropriate conditions and clauses must be included for the project contractors to follow and adhere to the recommendations of this ESIA and the RAP; and
- The client and his consultant for the project should adequately supervise implementation of the EMP and the RAP.
- Set up awareness raising programs to generate women's interest in the project's implementation. Community meetings can be held to induce women's interest and chart possible areas of participation. The majority of women in the area can be engaged in clerical, food services, light work and supplies of essential commodities at sight. A smaller percentage could be deployed in some categories of machine operations.
- It is important that workers are properly informed about STIs, HIV and AIDS. To address this issue effectively it is recommended that a specialized professional team is hired to handle matters regarding prevention campaigns to promote awareness and mitigation among workers and the surrounding population.

Key Provisions to be included in the Works Specifications

The provisions described in this section are recommended for inclusion in the Specifications of Particular Application and should be paid for under identified bill items. Most of these relate to the Contractor's obligations and are to be paid as a lump sum. Other items to be paid on measurement of quantities should be measured as required on completed work.
The following clauses should be included under the indicated sections of the Works Specifications:

Section: Contractor's establishment on site and general obligations

Clauses on "Use and Storage of Materials" should cover protection of watercourses and groundwater from pollution.

They should include provisions, requiring among other things that the Contractor shall propose to the Engineer details of measures he proposes to adopt in order to

reduce impacts on the environment of his worksites and facilities, and on the people living in the immediate vicinity. He should also be required to state his requirement as regards both the surface area to be used, the required bush clearing and any tree felling expected. He shall avoid trash and chemical waste dumping and ground water disruption or pollution of water table. The provision should require also that the worksite should be kept clean and litter free, with idle equipment properly secured in well-designated plant yard. He should limit the use of equipment, including bitumen plant and vehicles with high noise levels, or high emissions of air polluting gases; on avoiding the burning of wastes of any kind as a precaution against the outbreak of fires; and on the reduction of dust levels.

Section: Housing Offices and Laboratories for the Engineer's Site personnel

Include clause, which specifically requires that: Ablution and toilet facilities should be kept clean and regularly maintained, free from odour and of little risk to health and that there should be regular litter collection.

Section: Accommodation of Traffic

Clause on "Accommodation of Traffic" should specify that the Contractor is required to reduce disruption of the day-to-day activities of communities in establishing security and safety at diversions and at other worksites.

Section: Clearing and Grubbing

Clauses relating to Clearing and Grubbing and that for Disposal of Surplus Material, should require that spoil dumps should be isolated from normal working areas and from nearby settlements. They should not interrupt drainage or be susceptible to or increase the risk of erosion

Section: Drains

Clauses requiring temporary drains to be installed during construction should include standards for drainage to permanent and temporary housing to be used by the Contractor for staff accommodation to ensure that a storm water system is designed to handle the additional runoff expected. Guidelines should also be given for clearing of blocked culverts and side drains, and for reshaping of unlined open drains. The guidelines should require the Engineer to determine where the debris

from culvert and ditch cleaning and drain reshaping should be placed, so that it is at a sufficient distance from the roadside if placed upstream of the ditch or spread downstream with a counter-slope with respect to the ditch.

Section: Borrow Materials

The requirements for borrow materials should cover protection of trees, which should not be cut without approval of the Engineer, or destroyed during stock piling, drainage and finishing off or restoring the borrow areas to their original state on completion of the works.

Section: Landscaping and Grassing

The provisions under this section should include, qualifying clauses in respect of "Avoidance of invader species" during reinstatement and re-vegetation of quarry sites, borrow areas and campsites. The provision should also cover watering, cleaning and other tendering measures for planted trees and other approved plant species. Providing the planting material and maintaining the plants up to the end of the defect liability period, shall be covered for payment under a designated bill item.

APPENDICES

APPENDIX 3 **Minutes of Public Consultations**
APPENDIX 4 **List of Attendees at Consultations**

MINUTES of FIRST PUBLIC CONSULTATIONS

Minutes of the public consultation
Location: **Lichinga**
Date: 8/30/10
Start time: 8.30

The first public consultation for the environmental and social impact assessment for the rehabilitation of the N13 road, Cuamba-Mandimba- Lichinga, was held in Lichinga on August 30th 2010

This meeting was attended by 35 participants representing the provincial government, the private sector, civil society, community leaders and associations of owners of public transport (trucks and busses).

The general objective of the meeting was to present the project to rehabilitate the N13, explain the environmental and social implications that could be envisaged as a result of the project and address the questions and concerns of the stakeholders along the road that would be affected with the implementation of the project.

The representative of ANE-GAT was the facilitator of the workshop.

The provincial Permanent Secretary opened the meeting and invited participants to give their contributions by voicing the concerns and make suggestions for mitigation where possible.

The presentation was made by the consultant's team.

The presentation was followed by a session of questions and answers that covered the following important aspects:

- Clarity about the resettlement policy, with the focus on the type of compensation that would be provided and what kind of treatment will be given to farms that fall in the area of resettlement.
- Duration of the project and the need to manage expectations during the study
- The recommendation that there should be working relationship with community leaders in regards to resettlement. This would help to identify the existing improvements and prevent the emergence of new conflicts that previously did not exist (opportunism)
- Include in the information study on de mining along the road
- For the case of erosion do a preliminary analysis on the impact of this.
- The need for social responsibility
- The relevant institutions should be involved in the process of drafting the EIA
- Aspects of the study should be clarified and further analyzed
- Clarity as to the modalities that will be used in the employment unskilled labor
- Parameters set in the hiring process to avoid unjustified redundancies

- Addressing potential labor conflicts between different sub-contractors over workers which may result in the discharge of workers of a company on the road project
- Consider studying the political aspects associated with the project
- This being the initial process of obtaining financing for the asphalt, what alternatives exist to improve the transportation of materials, specifically during the rainy season up until the completion of the road works.
- Clarification on the extent of the project, which does not include the municipality of Cuamba. The project Nampula Cuamba included as a by pass. This is expected to open up opportunities for complementarities between the Municipality and funds allocated for this project for rehabilitation of the section within the city, because the equipment will already exist on site
- There was concern regarding the weak employment culture for local labor on salary which could create problems with employers. Some local labor look for capital to start a business and soon as that is attained; the tendency is to abandon the work.
- The police drew attention to the need for their involvement in order to conduct criminal background checks on job applicants.
- More clarity on the basis for the public consultation.
- Would like A public consultation where all strata of the community are consulted, not just the leaders
- The impacts should be very well evaluated and clear recommendations made which include goals, responsibilities and monitoring reports
- biophysical impacts should include the impact on ecosystems (migratory routes), clear recommendations on ways to control illegal hunting and burning zone during the construction phase
- The resettlement process may have some problems in its implementation with regards to cemeteries although the communities recognize the importance of handling this, but it should be investigated as to what extent the design of the project may be realigned to avoid unnecessary conflicts
- It was noted that the abandonment of jobs with some companies is due to the lack of commitment of those companies in paying wages
- The Permanent Secretary referred to the opportunity cost associated with the project or not during the EIA. And stressed the need for a strong collaboration between the study team and the district authorities.

Some clarification and responses were given by the consultant's team as well as by ANE. The recommendations will be taken into account during the process of the study.

Minutes of the public consultation
Location: **Ngauma**
Date: 8/31/10
Start Time: 9.00

The public consultation meeting was held at the district headquarters in Ngauma at 9am on August 31st. The objective was to present the environmental and social impact study within the framework of the project of rehabilitation of the N13 Road, Cuamba-Mandimba-Lichinga.

This meeting was attended by 45 people representing provincial government entities, private sector, civil society, community leaders and associations of transporters,

The general objective of the meeting was to address the questions and concerns of the parties that would be affected with the implementation of the project. The representative of ANE-GAT was the facilitator of the workshop.

The opening ceremony was conducted by the administrator of the district who advised participants to speak openly and to question any aspect that they had about the work of the road. The presentation was made by AGEMA and describes the objective of the study and the potential impacts on the biophysical and socio-economic environment and the area of the project that will need resettlement.

After the presentation, comments, clarifications or questions and recommendations from the audience were heard.

The health representative asked what would happen to the infrastructure and dwellings erected inside the reserve area of the road that came under resettlement and if there would be any compensation?

Mr Mada had the same concern about the improved dwellings There was a recommendation on teams sent to know for sure who would be affected and to what degree.

Another related concern was about the treatment of cemeteries and public infrastructure, what policy would be designed to minimize the impacts.

What would be the strategy to reduce sexually transmitted diseases and reduce the pressure on the health facilities in the area.

It was recommended that there should be a small health unit with a specialized health technician to work with the health services.

The women were concerned about the lack of jobs in the area and wanted to know if this project would increase employment for young people or if the contractor would bring in their own workers from outside.

The consultant explained that the contractor not being able to hire all the manpower locally that it needs on site would be due to the scarcity or lack of skilled labor in the

zone. It was clarified that the ANE recommends to contractors to hire 40% of the total non-specialized labor locally and at least 25% should be women. Also this labor would not be exclusively hired in Ngauma.

Minutes of the public consultation
Location: **Mandimba**
Date: 8/31/10
Start time: 15.00

The public consultation in Mandimba regarding the study of environmental impact within the framework of the project of rehabilitation of the N13 Road, Cuamba, Mandimba and Lichinga was conducted at 3pm on August 31st 2010.

This meeting was attended by 31 people representing provincial government entities, private sector, civil society, community leaders and associations of transporters.

The general objective of the meeting was to address the questions and concerns of the parties that would be affected with the implementation of the project. The representative of ANE-GAT was the facilitator of the workshop.

The Permanent Secretary of the district opened the event, encouraging participants to voice their recommendations and concerns. Then the consultant was invited to carry out a presentation of the project.

The concerns presented at this meeting do not differ from those made in previous meetings in Lichinga and Ngauma. In accordance with the community leaders the treatment given to cemeteries has varied, but the common practice has not been the exhumation.

The consultant explained that efforts were being made by the design engineers to bypass the cemetery in Mandimba town.

The community showed their satisfaction and readiness to accept the recommendations that come from the work to be performed but would like to know when the road rehabilitation would start. Their question on the project start date was because the previous year, there was a public consultation conducted by a Japanese team and since then the community has been waiting to hear back about when that project would start.

Clarification was requested about the level of involvement of local authorities and communities during the construction phase and the need to clarify the responsibilities of each area during the process in order to facilitate implementation. The Recommendation was made for the need of coordination between the government and the contractors during the recruitment process. In some cases the contractors bring their own workers. If local workers are hired, conditions need to be implemented to make IDs accessible for the population, currently many members of the community do not have national ID cards (BI).

Another concern was that contractors have not complied with the rules for protection of workers and sick employees are unjustly dismissed.

In regards to the practice of workers stealing from businesses and selling the stolen goods in their communities, the police will continue to penalize perpetrators.

Minutes of the public consultation
Location: **Cuamba**
Date: 9/1/10
Time of beginning: 9.00

Publication consultation was held in Cuamba at 9am on September 1st 2010 regarding the study of environmental and social impact within the framework of the project of rehabilitation of the N13 Road, Cuamba-mandimba-Lichinga.

This meeting was attended by 49 people representing provincial government, private sector, civil society, community leaders and associations of transporters.

The general objective of the meeting was to address the questions and concerns of the parties that would be affected with the implementation of the project. The representative of ANE-GAT was the facilitator of the workshop.

The Permanent Secretary(PS) of the district opened the meeting, and invited participants to voice their recommendations and concerns. The consultant for the study was asked to make a presentation of the project.

The discussion in Cuamba focused on non-inclusion of change within the municipality (about 6 miles) despite it being an integral part of the corridor. The PS pointed out the lack of addressing the political implications this could cause for the district. He indicated that several appeals have been tabled to pave the city similar to other cities through which a national road passes (e.g.Manhiça). Suggestions made included the following:

(i) negotiate with the contractor to use scrap/surplus asphalt for the various arteries in Cuamba; (ii) negotiate with the contractor to allot some days of the equipment and men to the Municipality,
(iii) negotiate with the road fund to use internal funds to pave the streets in the Municipality.
In regards to cemeteries it was agreed that consideration should be given to the transfer of the graves after consultation with the families. To provide safety for school areas, speed bumps must be erected in Mepica and Matuane.

MINUTES OF THE SECOND PUBLIC CONSULTATIONS

Minutes of the 2nd Public Consultations in Lichinga, Ngauma, Mandimba and Cuamba

December 14 -16, 2011

Presentation of the final report of the Environmental and Social Impact Assessment for the rehabilitation of the N13

The second series of public consultations to present the draft final report of the environmental and soicial impact assessment (ESIA) for the N13 was held from 13-15 December 2011 in the districts of Lichinga, Ngauma, Mandimba and Cuamba.

Following acceptance of the draft ESIA report by the client, ANE, the consultant AGEMA proceeded with preparations to hold the second public consultations in the affected districts. Two weeks (15 days) prior to the meetings, announcements to publish the dates of the meetings were made in newspapers and local radios in Lichinga, Ngauma, Mandimba and Cuamba. In addition to the announcement in the media, invitations were sent out to stakeholders such as the provincial government, city council of Lichinga and Cuamba, district administration in Ngauma and Mandimba, the provincial ANE delegate, provincial and district departments of public works and housing (DPOPH), agriculture (DPA), environmental issues (DPCAN), education and culture (DPE), health (DPS), NGOs, forestry enterprises and association of transporters.

The public consultation was to present results of the study, seek validation by the stakeholders and beneficiaries and solicit iideas, discussions and suggestions to improve the final ESIA report.
The meetings took place from December 13 to 16 2011.
The attendees at the meeting were representatives of the provincial and the district government the municipality of Lichinga and Cuamba, community and religious leaders, civil society members, the Economic Agencies in Niassa, representatives of forestry companies and the general community.

The objective of the meeting was to present the results of the ESIA and the RAP for validation by the beneficiaries
The rationale was to ensure that the concerns and expectations expressed by participants in the first public meetings were considered during the study and are reflected in the draft report

The moderator at all the meetings was the environmental officer from ANE, Mr.. Artur Chilaúlé.

All the meetings started with a welcome of participants by Mr. Chilaule in the name of the client. He stated that the objective of the meeting was to present the results of the ESIA that was conducted in 2010/2011. He encouraged participants to listen to the presentation to validate if their concerns expressed in the 1st public consultations were properly and fully addressed. He urged them to make necessary corrections, ask questions, propose recommendations and in general to contribute towards improvement/enrichment of the report

The meetings at all locations were opened and closed by the highest government official present at the time of the meeting.

The report was presented by the consultant, AGEMA Consultoria. The process included a power point presentation which gave a brief summary of the first public consultations held in September 2010, followed by the findings and recommendations of the ESIA.

After the presentation there was a question and answer (Q&A) session which included debates and discussions.

The draft report was presented in 4 parts.

1 An introduction that describes:

- the study area, the proponent (ANE)
- the funding partners (AfDB, JICA and the government of Mozambique).
- The rationale for the rehabilitation of the N13: to improve the targeted districts and province socio economic needs including communications within and outside the country, improving the circulation of people and goods and reduce transaction costs.

2 Brief summary of the discussions and suggestions made at the first public consultations. (specifics for each district were presented in the specific district)

3 Presentation of the positive and negative social impacts and mitigation measures for each impact.

4 Brief presentation of the RAP

In this section it was explained that the properties that have been identified for resettlement and compensation included houses, shops, farms and fruit trees

Compensation and everything related will be handled by ANE and the local authorities. Compensation will include all costs for material and labor. Also demolished materials will be kept by the respective owner of the property.

As was mentioned in the first public presentation, it was repeated that the cut off date was May 25, 2011 and only properties identified, marked and registered up until that date will receive monetary compensation for the construction of their houses. Compensation will be paid at least 12 months before the start of the project to allow people adequate time to resettle.

Lichinga December 14, 2011

The first in the series of the final public consultations was held in the city of Lichinga at 9am on December 13, 2011.

The ANE representative, Artur Chilaúlé then invited the Permanent Secretary to open the session.

The Permanent Secretary opened the session on behalf of his Excellency the Governor of Niassa province, who was unable to attend. He expressed the importance of the N13 as a key factor in the development of the province and encouraged the participants to pay attention to the information presented and encouraged them to voice any questions, concerns and recommendations. Following these words, the session was officially opened.
AGEMA was called to present the report.

After the power point presentation, the Q&A session ensued. (The names of the participant/organization are in italics. Resp = answers provided in response to questions.)

The following were questions and contributions from participants.

Mr. FUNAGNI
1. From the point of view of the consultant, are donor policies are applicable Mozambique?

Resp : The laws of donors, if based within the context of the country's laws, can be used to address situations that the Mozambican laws do not cover.

Mr Arthur Graciano-provincial director of public works and housing
i The provincial Directorate of Agriculture should be responsible for areas attributed to Forestry Companies especially the section of the N13 between Lichinga and Ngauma where the forest trees are near the road.

Resp: The forest fields that were within the ROW are only in Cuamba district and belong to Mozambique Leaf Tobacco. We do not expect that they will require compensation.

ii. The contractor should comply with the Mozambican laws and procedures in the hiring of people to avoid the problems encountered in previous projects.

Resp. 45% of the workforce the contractor recruits shall be local, of which 25% will be female. Recruitment will be done in coordination with the district Government and community leaders.

iii. Have the locations for resettlement already been identified?

Resp : No not yet, however in may cases houses will only have to be pushed back within the same compound.

Mr Faizal Laka – representative of the Economic Agency of Niassa.

i. When will the project really start considering that this road is extremely important for this province and there have been so many meetings about this road without results.?

Resp (by ANE rep): This meeting was the last one pending. A report will be sent to MICOA for approval to issues a license. and then it will be sent to the donors with the real value of the project, but it should be noted that there was a meeting with donors, who have guaranteed the availability of funds for this project.

ii. Has the population been informed about the removal of cemeteries, trees, etc., to get their reaction?

Resp : Populations were first informed of the removal process in 2010 during the first public consultations. Also, they participated during the data collection and owners of structures to be removed were present and signed in agreement.

The removal of cemeteries will be carried out in coordination with the family and community leaders.

The compensations for removed trees will be based on the table provided by the department of agriculture.

iii. Do the new areas have water points for the resettled population?

Resp: Locations for the resettled population must meet the basic conditions and have the primary needs of the population.

iv. these results would hold greater significance if they contained the monetary values of the project.

Resp : AGEMA was contracted to conduct the ESIA, a separate group has done the engineering study and this study will include the monetary value of the project

The representative of the Association of Transporters

What is the expected impact to local businesses, carriers and subcontracting?

Resp: Public tenders will be open to national and international bidders, this means that, any national or foreign company can compete for the contract and some subcontracts, but local businesses will have priority. Some of the impacts on local businesses will be a reduction in the cost of living, reduction in the cost of transport and the maintenance of vehicles, reduction in fuel consumption, reduction in dust pollution and reduction in travel time; .

Mr Bucurto-Director of the Pedagogical University

i During the study, was the issue of erosion taken into account? A problem that has plagued

province.?

Resp: This problem has been taken into account, the contractor will plant trees in sensitive areas, replant in areas where trees that existed were destroyed and will construct appropriate drainage.

ii-What measures will be taken to control air pollution?

Resp: The contractor must comply with laws regarding maintenance and use of equipment and the amount of gases heavy vehicles are allowed to emit.

- Area stripped of vegetation will be limited to the minimum necessary and will be reinstated as soon as practically possible.
- Water will be sprayed to dampen dust in dry conditions,
- vehicle speeds will be limited in areas in proximity to dwellings and other habitation
- speed of earth moving vehicles will be limited to 20-30km/hr on windy days

Representative from Chikweti Forest company

during the study did any pine and eucalyptus plantations fall in the area of influence?

Resp: No.

Several questions were raised regarding the design of the road and the provincial director of public works and housing made the following clarification:

1. that AGEMA was contracted only to make the environmental impact study. Engineering related issues are the responsibility of the consulting engineers responsible for project design.

2. Local contractors will be made aware when tenders are launched.

The representative from the Chikweti Forest Company made the following suggestions;

1. Street connections should be done in a manner that the city and suburbs are connected in order to avoid congestion in the city.

2. The contractor should address the conduct of its male employees in regards to their relation with the local women to avoid unplanned pregnancies.
Another participant responded that with regards to that issue, it is recommended the construction of camps away from communities, but what happens is that communities approach the camps to sell products and contact with the workers occurs.

Another suggestion was that the government should consider the need for toll road to guarantee maintenance and sustainability.
The City Counselor made the following clarifications with regard to some issues raised.

1. the plan to build a cargo terminal in Lulimile will prevent the entry of heavy trucks to pass through the city
2. There is also plan to build a road from Lulimile through Noamba to the industrial zone.

Provincial Director of Tourism

Forestry companies do not obey the road reserve laws.

Resp: Plants that are inside the corridor of impact (COI) will be removed.

Once the Q&A was done, the facilitator thanked all the participants and invited the Permanent Secretary to proceed with the closure of the meeting. The permanent secretary thanked AGEMA for the presentation and that the district was waiting to hear when the commencement date for the project would be set. He then declared the meeting closed.

Minutes of the 2nd public consultation in Ngauma District
December 14, 2011

The meeting in Ngauma started at 8 am and was presided by the district administrator.

She welcomed the consultants and the team from ANE and expressed the appreciation of the district government and the importance of the N13 road project for the district. She urged the participants to pay attention to the information presented and encouraged them to participate actively and get answers to their concerns. Following these words, the session began.

The consultant presented the report of the study and then the audience was invited to present commentaries and questions.
To reduce the expected impacts, the following measures have been taken: the contractor must work during the hours of 6:00 a.m. to 8:00 p.m. The contractor's workers should not practice hunting, the contractor should provide gloves, masks, boots, etc. for their workers, the contractor must locally recruit 45% of the manpower required and the archaeological sites, cemeteries and holy sites should not be destroyed.
The properties that have been identified in the area of influence are houses, farms, fruit bowls, tents, cemeteries, etc.
Populations that will be affected shall be marked by March 25, 2011 and will receive monetary compensation for the construction of their houses, 12 months before the start of the project.

Mubasher Bindo
i. How many houses in Ngauma will be resettled?

Resp : The Ngauma district has 14 homes identified for resettlement.
ii. Will the farms be measured in hectares?
Resp: Yes. 32 hectares were identified in Ngauma.

Paulo Cosmo John
Were houses at 90m from the road covered?

Resp: No, because it falls outside the area known as the right of way.

Chiboa

It was made clear that the 14 houses referred to are those that have been registered by March 25, 2011, the houses that were built after this time will not be considered.
The consultant confirmed that this was the case.

Community Leader

How will small houses and farms be compensated according to the Act of resettlement?

Resp : The houses covered shall be calculated based on the table of the public works and the value of compensation will be based on the value of your Home. Farms, plants and fruit trees shall be calculated using the table from the department of agriculture.

Manuel Gonçalves

i. Will we have enough time to rebuild houses, once we are notified?

Resp: The owners of affected structures will be given 12 months advance notice in order to have time for rebuilding.

ii. What will happen to the 2 mosques and water well?

Resp : Community leaders will be contacted about local structures and together we will reach a decision on what to do.

Regulo Ncanja

Where does the 12 m area instead of 30m area spoken about in 2010 start?

Resp . The 12 m area starts from the edge to each side of the road.
Once the participants' issues were addressed, the administrator brought the meeting to a close. The administrator thanked the consultants and assured that the information from this meeting and meetings held in 2010 would be relayed to the population at large.

Minutes of the 2nd Public Consultation in Mandimba
December 14, 2011

The meeting started at 15.00 hours and the ANE environmental officer, Mr Artur Chilaúle welcomed the participants to the meeting and then invited the administrator to proceed with opening the session.

The administrator expressed the appreciation of the district government stressed the importance of the N13 Lichinga/Cuamba road project for the Mandimba town and the district at large. He urged the participants to pay attention to the information to be presented and encouraged them to voice their concerns and participate in formulating recommendations.

Following these words, the session continued with a presentation of the findings of the study by AGEMA..

After the presentation, Mr Chilaulé, the moderator invited the audience to participate in the Q & A session and urged them to feel free to ask questions, make corrections and suggestions to improve the report.

Below are the interventions of the audience.

1 *Lena Saide*

a. In the best interest of the communities where the road project will be implemented, the bulk of the labor force should be recruited locally.

b.. The news that the graves will not be removed satisfies the population.

The consultant thanked the lady for her contribution and stated that employment of labor locally was one of the mitigation measures in the environmental and social management plan (ESMP). Also that it was good that the population was happy about the decision to not resettle graves.

2 James Mackay

i. There are houses that have not been marked along the road are they included in the list for compensation?

Resp . The houses that have not been marked are because they are not within the area of referred to as the right of way (ROW) and will not be compensated.

ii. What will be the compensation for fruit trees?

Resp .The compensation for fruit trees has been calculated based on the table provided by the provincial directorate of agriculture.

3 Oscar Namubolodge

i. Where will the relocated graves be placed?
Resp . There is no relocation of graves. The new road alignment in Mandimba bypass' the cemetery.
ii. How will the monetary compensation for the relocated houses be paid out?
Resp . Compensation will be given 12 months before the beginning of the project, to allow enough time for homes to be rebuilt.

The audience recommended to consider recruiting the many young people with skills in Mandimba during the implementation of the project.

Again the consultant repeated that this will be in the ESMP as a mitigation measure.

Once the participants' issues were addressed, the administrator brought the meeting to a close. The administrator thanked AGEMA Consulting for presenting the EIAS report and that the district was waiting to hear when the commencement date for the project would be set. The administrator then closed the meeting.

Minutes of the 2nd Public Consultation in Cuamba District
December 15, 2012

The meeting in Cuamba opened by the district administrator who for a second time welcomed the project and stressed the importance of the road in connecting Cuamba to Lichinga.

The administrator expressed the importance of the project in the development of the province. He encouraged the stakeholders present to participate, listen attentively to the findings of the study and voice their recommendations. The administrator declared the session open and invited the consultant, AGEMA to present the report.

The following were concerns expressed by participants.

1 Mr. Valentine Bombaissa

Will the company that builds the road comply with the conditions stated in the contract to preserve the environment?

Resp. The contractor will make a program that complies with the guidelines stated in the report and in the environmental and social management plan. The contractor, engineering consultant and ANE will have environmental experts to ensure the fulfillment of all mitigation measures. prevention measures against HIV and AIDS and all the sites where the contractor excavates be rehabilitated.

2 Roberto Simão

i. What was the total cost of the project and the consulting services?

Resp.

We do not have the exact cost of the project but this will be communicated to all the provinces by ANE prior to the execution of the works.

ii. Will the consultant work in coordination with the provincial directorate of education and culture to identify historic sites?

Resp: During this study all historic sites have been identified and mitigation measures are in the ESMP. However, there is no evidence in the detailed project design that the road alignment will pass through any historic site. Nonetheless, the contractor and ANE will work with community leaders, the provincial and district offices of education and culture to preserve historic sites and other cultural infrastructures.

iii. Have the studies been completed? When will the road rehabilitation start.?

Resp: Yes, the detailed design, also the environmental and social impact assessment including the resettlement action plan have been completed.

Regarding start of the project, Mr. Chilaule responded that, the funding agencies AfDB and JICA have committed funds for the project, however the government has the responsibility to first resettle the people who will be affected by the project.

3 *Interim President of the municipality of Cuamba*
Is there a chance that the submitted report will be rejected by the donors?

Resp . No. The scoping report which includes details of how the study would be conducted was approved. This is the final stage of the study and the minutes of these meetings that we are holding now will be included in the final report.

4 Community member
Will the road pass through the municipality of Cuamba?

Resp . The project passes through the municipality of Cuamba, it is part of the Nampula-Cuamba road project and this study includes part of the municipality.

5 Representative of mineral resources
We recommended that the consultant instructs contractors and sub-contractors to abide and pay the taxes required by the Moazambican goverenment in the use and excavation of resources like stone.

After the Q& A session, Mr. Chilaulé from ANE stated that in spite of informing people of the cut off date, March 25, 2011 for houses registered for resettlement, there were new houses built along the road after the cut off date. He reiterated that these houses built in the right of way will not be resettled and will not appear in the registry of houses for compensation.

Following this warning statement, the administrator was asked to close the meeting.

The administrator thanked the consultant for the presentation. Regarding the houses built after registration of houses for resettlement, he said he could take the case up to the District Government for local authorities to resolve the issue. The administrator appealed for the project to start soon in order to avoid more construction of houses in the ROW.

He also asked if the city could have a social benefit from the road project such as a football field or a water fountain etc. With these final remarks, the 2° public consultation was closed.

LIST OF PEOPLE AT PUBLIC CONSULTATIONS