No.

NATIONAL ROAD ADMINISTRATION
REPUBLIC OF MOZAMBIQUE

THE PREPARATORY STUDY
ON
ROAD IMPROVEMENT PLAN
IN NACALA DEVELOPMENT CORRIDOR
(N13: CUAMBA-MANDIMBA-LICHINGA)
IN
THE REPUBLIC OF MOZAMBIQUE

FINAL REPORT
2 of 3
MAIN TEXT

Volume 4
Part VII Regional Development Program

February 2010

JAPAN INTERNATIONAL COOPERATION AGENCY

Eight - Japan Engineering Consultants Inc.

Oriental Consultants Co., Ltd.

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The following foreign exchange rate is applied in the study

1 US dollar = 28.00Mtn = 91.36 JP Yen, or 1 MTn = 3.26 JP Yen (October 2009)

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PREFACE

In response to the request from the Government of the Republic of Mozambique, the Government of Japan decided to conduct the Preparatory Survey on Road Improvement Plan in Nacala Development Corridor (N13: Cuamba-Mandimba-Lichinga) and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA dispatched a Study Team headed by Mr. Hisashi MUTO of Eight-Japan Engineering Consultants Inc. and consist of Eight-Japan Engineering Consultants Inc. and Oriental Consultants Co., Ltd. to Mozambique, between March 2009 and December 2009.

The Study Team held discussions with the officials concerned of the Government of Mozambique and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Mozambique for their close cooperation extended to the study.

February 2010,

Kiyofumi KONISHI
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

Mr. Kiyofumi KONISHI
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

February 2010

Dear Sir,

LETTER OF TRANSMITTAL

We are pleased to submit to you the Final Report of the Preparatory Survey on Road Improvement Plan in Nacala Development Corridor (N13: Cuamba-Mandimba-Lichinga) in the Republic of Mozambique.

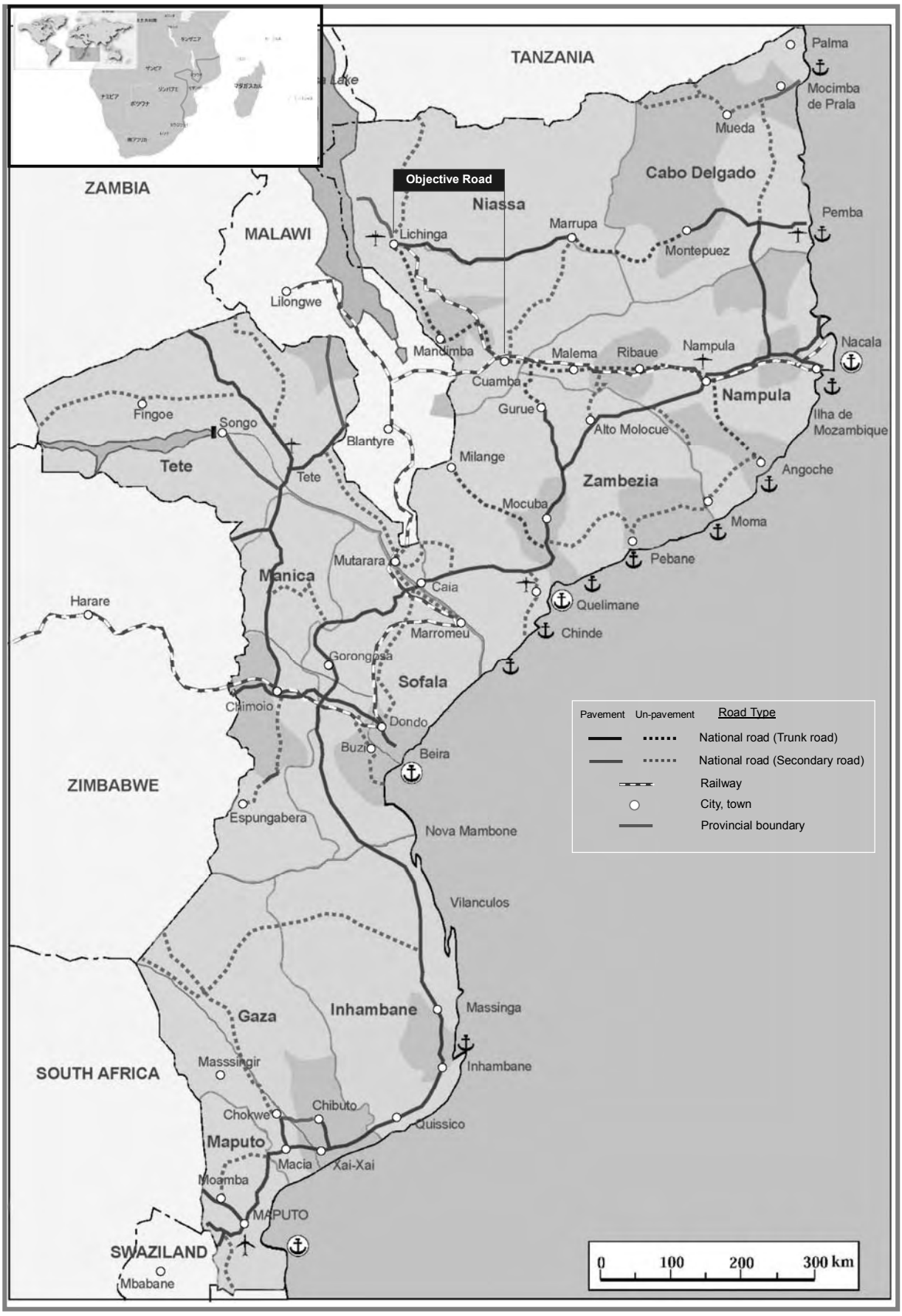
This study was conducted by Eight-Japan Engineering Consultants Inc. and Oriental Consultants Co., Ltd. under a contract to JICA, during the period from March 2009 to February 2010.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, Ministry of Foreign Affairs of Japan, National Road Administration, JICA Mozambique Office and Embassy of Japan in Mozambique for their cooperation assistance throughout the Study.

Finally, we hope this report will contribute to further promotion of the project.

Very truly yours,

Hisashi MUTO
Team Leader,
The Preparatory Survey on Road Improvement Plan in Nacala Development Corridor
The Consortium of Eight-Japan Engineering Consultants Inc. and Oriental Consultants Co., Ltd.



Project Location Map

Project Outline

1. Country	Republic of Mozambique
2. Name of Study	The Preparatory Survey on Road Improvement Plan in Nacala Development Corridor (N13: Cuamba-Mandimba-Lichinga) in the Republic of Mozambique
3. Counterpart Agency	National Road Administration (ANE), Ministry of Public Works and Housing(MOPWH)
4. Objectives of the Study	(1) The objectives of the Study are to determine the most technically feasible and economically viable, environmentally acceptable and socially optimal option of upgrading the existing Cuamba – Lichinga road to an all-weather road for easier transit. (2) Formulation and recommendation of the "Regional Development Program" intended for Niassa Province is also the objective of the Study.

1. The Study Area

- The Study Road, with a total length of approximately 302km including the Mandimba-Malawi Border road, traverses four districts having high agricultural potential, namely Cuamba, Mandimba, Ngauma and Lichinga in Niassa Province.
- The Cuamba-Mandimba-Malawi Border road is an important component within the Nacala Development Corridor, since it connects Niassa and Nampula Provinces, and in addition it serves to link landlocked Zambia and Malawi to the Mozambican coast.

2. Scope of the Study

(1) Economic Feasibility Study

1) Economic Analysis, 2) Traffic Analysis, 3) Economic Evaluation, 4) Risk Analysis

(2) Preliminary Engineering Design

1) Site Measurement (Natural Condition Survey), 2) Visual Site Survey, 3) Preliminary Design, 4) Cost Estimate

(3) One Stop Border Post (OSBP)

(4) Assistance for Execution of EIA by GOM (ANE)

(5) Regional Development Program

3. Narrative Description

Feasibility Study

The Study Road passes through many small villages. The road can be broadly divided into three terrains (0 – 148km: Flat terrain, 148 – 240km: Rolling terrain, 240 – 302km: Rolling with some mountainous terrain), and it undulates from a starting altitude of 560MASL reaching up to nearly 1,400MASL at Lichinga. The existing horizontal alignment and vertical alignment generally follow the watershed crest and the natural ground, respectively. The existing road is in fair to poor condition during the dry season and becomes impassable during the rainy season due to interaction between poor drainage and erodible soils. In addition the Study Road width varies between 5m and more than 10m and is generally lower than the surrounding ground.

As a result of the traffic demand analysis, future traffic volumes for both sections (Cuamba-Mandimba and Mandimba-Lichinga) in 2023 were estimated at about 1,481AADT and 1,732AADT, respectively. From the viewpoint of terrain, traffic safety, construction cost, social impacts, traffic management and operation, a design speed of 100km/hr was recommended for the section of Cuamba - Mandimba. Similarly, a design speed of 80km/hr was recommend for the section of Mandimba - Lichinga. And furthermore, the selection of the suitable pavement composition was evaluated based on the initial cost and its financial viability using the EIRR indicator. As a result of the analysis, a DBST surface on a granular base and cemented sub-base was selected as the most economically viable pavement composition. This composition was shown to have the lowest initial cost and the highest EIRR.

Regional Development Program

Niassa Province has the potential for various kinds of development. However, bad access conditions have hindered economic development in the province. Furthermore, huge areas, scattered population and low population density have made it difficult to deliver basic social services to the people. The Study Team formulated a regional development program so that the road improvements of Cuamba-Mandimba and Mandimba-Lichinga could generate synergistic effects on regional development. For the southern part of Niassa Province, such development measures included the support to smallholding farmers' commercialization and agro-processing industries, and infrastructure development for improving logistic functions in the towns of Cuamba and Mandimba. For the middle to northern part of the province, high priority was given to the support of smallholding farmers' commercialization, wood processing industries and tourism, as well as to improvement of social infrastructure and services.

4. Conclusion and Recommendations

(1) To authorize the regional development program proposed by the Study in conjunction with the road implementation plan.
(2) To advance the bilateral discussion for OSBP and to establish a policy relevant to the following issues:
- Types of operational system for OSBP scheme
- Layout and facility size
- Implementation program such as "Two-step upgrading," proposed by the Study

(3) To adopt the COI concept for minimization of social impacts such as resettlement.
(4) To start the detailed design for Cuamba - Mandimba Road (154km) as soon as possible.
(5) To execute a severe site survey (Topographic, Geological and Soil) for Mandimba - Lichinga Road.

5. Report Structure

Name of Report	Number of Volume	Main Contents of the Report		Language		
				Eng.	Por.	Jap.
1. Summary	-	-	-	✓	✓	✓
2. Main Text	Volume-1	Part I	Overall Approach & Work Procedure	✓	✓	
		Part II	General Appreciations			
	Volume-2 **Cuamba-Mandimba Section**	Part III	Preliminary Road Engineering Design			
		Part IV	Economic Feasibility Study			
		Part V	Cross Border Facilities			
	Volume-2 **Mandimba-Lichinga Section**	Part III	Preliminary Road Engineering Design			
		Part IV	Economic Feasibility Study			
	Volume-3	Part VI	Environmental and Social Considerations			
	Volume-4	Part VII	Regional Development Program			
3. Drawings	Cuamba-Mandimba Section	-	-	✓	✓	
	Mandimba-Lichinga Section	-	-			

Executive Summary

Part I Overall Approach & Work Procedure

Mozambique is located on the south-eastern coast of Africa and covers an area of 799,380 sq. km. It is bounded on the north by Tanzania; on the west by Malawi, Zambia, Zimbabwe, Swaziland and the Republic of South Africa (RSA); and on the entire eastern boundary by the Mozambican channel of the Indian Ocean. Mozambique's 17-year civil war, which lasted until 1992, ruined much of the country and destroyed key road infrastructure.

The Government of the Republic of Mozambique (hereafter referred to as the "GOM") assumed that the limited access to roads and other socio-economic services is a cause of the country's poverty and gave priority to improving infrastructures in areas with high potential for agricultural production, etc. in the Action Plan for the Reduction of Absolute Poverty (PARPA II: 2006 – 2009).

A main goal of the Road Sector Strategy 2007-2011 (RSS) is to serve the efficient road network to the prioritized economic areas such as agricultural areas, tourist sites and areas of industrial or natural-resource development that have the greatest potential to contribute to economic growth and PARPA II.

Given the above-mentioned situation, the GOM requested the Government of Japan (hereafter referred to as the "GOJ") to conduct a feasibility study (F/S) for the Upgrading of the Nampula - Cuamba Road. In response to this request from the GOM, the GOJ conducted "The Study on Upgrading of Nampula - Cuamba Road" from 2006 to 2007. In Nampula – Cuamba section, the detail design has been put forward for construction by the counter fund of GOJ.

The Study Road (N13: Cuamba – Mandimba – Lichinga), as part of the two Mozambican corridors (Nacala N13/N1 and Lichinga-Pemba N14/N1 corridors), provides a strategic link to the Malawi Border at Mandimba with the ports of Nacala and Pemba, in Nampula and Cabo Delgado Provinces respectively. Although the Study Road has much potential for stimulating development and reducing poverty throughout the entire northern area of Mozambique by enabling efficient connection, the section concerned is the only unpaved section.

Accordingly, the Japan International Cooperation Agency (hereafter referred to as "JICA"), the official agency responsible for the technical cooperation of the GOJ, undertook the Study including regional development program of Niassa Province along the Study Road in close cooperation with the concerned authorities of Mozambique.

The objectives of the Study are to determine the most technically feasible and economically viable, environmentally acceptable and socially optimal option of upgrading the existing Cuamba – Lichinga road to an all-weather road for easier transit. The Study also determines the impact of providing an all-weather road on poverty reduction and environment.

And establishment of the "Regional Development Program" intended for Niassa Province is also the objective of the Study. This program aims to extend the improvement effect to the wide area in conjunction with the road improvement (Nacala N13/N1 and Lichinga-Pemba N14/N1 corridors).

Part II General Appreciations

1. Government/Sectoral Policy

National policy and planning in Mozambique all have poverty reduction as a key objective. The Mozambique Government has been combating absolute poverty under the Poverty Reduction Strategy Paper (PARPA: 2001-2005) and PARPA II (2006-2009). The target of PARPA II is to reduce the incidence of absolute poverty from 54% in 2003 to 45% in 2009.

And Mozambique's transport sector is governed by the following road sector policies and strategies:

- Road Sector Strategy 2007-2011 (RSS)
- Integrated Road Sector Program 2009-2011 (PRISE)
- Semi Annual Work Plan and Budget (SAWPB)

2. Responsible Institutions for the Sector

Mozambique's road network is currently managed by the National Road Administration (ANE), which reports to the Ministry of Public Works and Housing. The Road Fund is responsible for managing the funds for the sector.

3. Traffic Modal Split

In Mozambique, the roads occupy a large share of both freight (58.2%) and passenger transport (96.1%) among all modes, particularly for passenger transport which is almost totally reliant on the road network. On the other hand, at 27.9%., contribution of the railway mode is relatively high for freight transport. Marine transportation (8.3%) also contributes towards transportation of freight. The air mode only shares a low ratio for both goods and passenger transport due to lower transport capacity.

4. Road Classification System and Conditions

Mozambique has classified roads which consist of national roads (primary and secondary) and regional roads (tertiary and vicinal roads). These roads are administrated by ANE. Urban roads and unclassified roads fall under the jurisdiction of the municipal councils and the district administrations respectively.

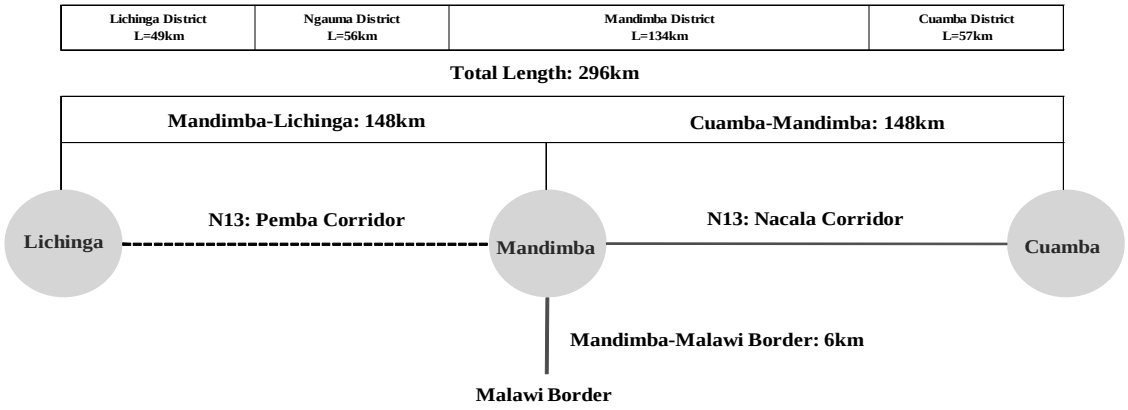
The current Mozambique classified road network is estimated at around 30,000km of which less than 20% is paved. Of the paved roads, the majority are estimated to be in good to fair condition (88%), however only 57% of the unpaved roads are estimated to be fully travelable. A key element of the RSS and of the Strategic Maintenance Plan (SMP) is the introduction of a Paved Road Management Programme (PRMP), which will be managed separately from the rest of the road network. SMP takes care of the 30,000km of classified roads and an additional 3,000km of urban roads.

[Cuamba-Mandimba Section]

Part III Preliminary Engineering Design

1. General Observations

The Study Road can be broadly divided into two sections (Cuamba-Mandimba Section and Mandimba-Malawi Border Section) and the road length of each section is indicated in the following figure.



Outline of the Study Road

2. Natural Condition Survey for the Study Road

The aim of the natural condition survey is to confirm the existing natural conditions for the Study Road with a view to making a road design. Natural condition survey is composed of the following three works.

1) Topographic Survey (Road alignment survey, Aerial survey, Bridge survey, Benchmark setting), 2) Geological Survey, 3) Soil & Material Survey

3. Hydrology and Hydrological Analysis

Following table shows the results of the flood level calculation by the HEC-Ras, which is based on the calculation for non-uniform flow.

Bridge	Return Period	Discharge (m3/s)	Calculated Flood Level (m)	Results of Field Survey (m)
Muambessi	50-Year	312.0	618.50	616.9
	100-Year	390.9	619.28	
Lussangassi	50 Year	589.9	639.42	637.5
	100 Year	731.4	639.92	
Ngolua	50-Year	246.4	704.16	706.2
	100-Year	307.9	704.85	
Ngame II	50 Year	243.7	708.61	709.2
	100 Year	301.7	709.15	

4. Applicable Design Standards

The application of a proper design standard will ensure that the following objectives are achieved:

- Ensure safety, a high standard service level and comfort for road users by the provision of adequate sight distance and roadway space,
- Ensure that the roadway is designed economically
- Ensure uniformity in the design
- Ensure safety of the structures (bridges and culverts).

For the design studies of the Nampula-Nacala Road and Nampla-Cuamba Road which are a part of Nacala Corridor, the Study Team proposed to use the Southern Africa Transport and Communications Commission (SATCC) design standards, as these were commonly used for other projects in the region.

5. Preliminary Engineering Design

Through discussions with ANE and the results of field surveys by the Study Team, the concept of the Project was confirmed as follows:

- To create an efficient primary road connection securing smooth traffic flow throughout the year corresponding to the future traffic demand
- To create a safe primary road connection by reducing the risk of accidents and the rate of injuries to pedestrians by motorized vehicles

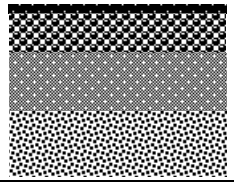
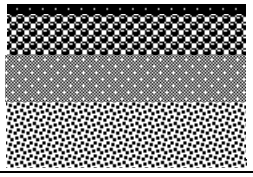
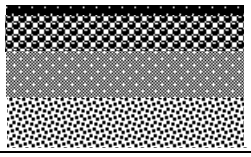
(1) Recommendable Alignment

The following table shows the improvement magnitude and effect of the recommended alignment. In regard to the section between Cuamba and Malawi Border, it was clarified by two indices (horizontal curvature and rise plus fall) that the existing alignments both horizontal and vertical almost meet criteria for a design speed of 100km/h. This means that improvement to the recommended alignment will basically be carried out on the existing road.

			Existing	Plan
Length (km)			153.8km	152.9km
Terrain			Flat	Flat
Design Speed			-	100km/h
Geometry	Horizontal Curvature	deg/km	22.4 (1.00)	21.2 (0.95)
	Rise + Fall	m/km	9.8 (1.00)	9.8 (1.00)
	No. of Rises + Falls	no./km	4.5	3.3
No. of Level Crossings			8	2

(2) Suitable Pavement Compositions

A mechanistic analysis using ELSYM5 was conducted according to the design CBR. The results of the analysis are as shown in following table.

S2 (3-4)	***S3 (5-7)***	***S4 (8-14)***
		

: G4 Crushed or Natural Gravel Base Soaked CBR>80%@98% mod. AASHTO density

: C4 Cemented stabilized Sub-base 0.75-1.5Mpa@100% mod. AASHTO density

: G7 Selected Layer Soaked CBR>15%@93% mod. AASHTO density

Poisson's ratio & Elastic coefficient (Elastic coefficient = (10 x CBR)Mpa)

G4: 0.35, Phase-I: 400Mpa, Phase-II: 400Mpa, Phase-III: 300Mpa

C4: 0.25, Phase-I: 1500Mpa, Phase-II: 600Mpa, Phase-III: 300Mpa

G7: 0.35, Phase-I: 150Mpa, Phase-II: 150Mpa, Phase-III: 150Mpa

(3) Bridge Design

By the discussion with ANE, bridge inner width has been set as 9.2m for two-lane bridges. Those are summarized in following table.

General		Existing bridge			New bridge			
No.	name	width	length	existing	lane	width	length	from existing Br.
(Cuamba)								
1	Muambessi	4.8	14.3	demolish	2-lane	9.2	17	same position
2	Lussangassi	3.2	28.0	demolish	2-lane	9.2	34	down stream 8m
3	Ngolua	4.7	14.0	demolish	2-lane	9.2	17	same position
4	Ngame-II	4.9	28.0	demolish	2-lane	9.2	34	same position
(Mandimba)								

6. Construction Planning

The construction plan was proposed for improvement of Cuamba – Mandimba road on N13 including construction method, procurement of material and equipment, and construction schedule according to site condition, structural scale and work quantities.

7. Project Implementation Plan

Project implementation plan was proposed based on some constraints affecting the schedule as below:

- Selection of consultant for D/D will require four to five months procedure and preparation of D/D with tender documents will require minimum five months.
- Preparation of environmental impact assessment and RAP will require about eight to nine months and will be submitted to AfDB and JICA 120 days prior to the submission of the appraisal report and loan agreement of the Project, respectively.

- Tendering for construction contractor will require minimum nine to ten months procedure including pre-qualification, tender announcement, tender preparation limited to 90 days and tender evaluation and approval by ANE and lending agencies
- Construction work and supervision service will require about three years (33 months)

8. Project Cost Estimate

Basically unit construction cost of "Upgrading of Nampula – Cuamba Road" (hereinafter referred as "NCR") is utilized for the Estimate due to high similarities between the two projects as follows.

- Site location: The Project road is the extension of NCR beyond Cuamba in northern region.
- Time of estimate: Engineering estimate of NCR was finalized at its detailed design stage in April 2009.

The results of the Estimate are summarized in the following table.

Description		Final (USD)
		DBST
1000	General	21,773,229
2000	Drainage	6,205,937
3000	EW & granular layers	47,887,098
4000	AC & seals	13,525,335
5000	Ancillary	2,501,784
6000	Structures	6,051,036
7000	Test & QC	17,250
8000	Others	1,573,090
	Total (Bill A: Road)	**99,534,760**
	Bill B: Day works	855,999
	Bill C: Social issues	935,627
	Bill D: Environmental	248,837
	Total (Bill A to D)	**101,575,223**
	Contingencies (10%)	10,157,522
	IVA (6.8%)	7,597,827
	Total construction cost	**119,330,572**
	Engineering cost (5%)	5,586,637
	IVA (6.8%)	379,891
	Total project cost	**125,297,100**
	Compensation cost	156,103

	Project cost per km	**820,492**

9. Road Maintenance Systems

ANE's ten provincial delegations are responsible for the implementation of all maintenance works on classified roads. The Directorate of Maintenance has a crucial role in ensuring that the delegations in provinces are fully aware of and complying with the technical and operational guidelines for implementation of the annual maintenance plan; and that roads of all types (primary, secondary, tertiary, vicinal, paved, unpaved) are being maintained and provided .

Part IV Economic Feasibility Study

1. Existing Traffic Flow Patterns

The Study Team conducted the following surveys and research to recognize the characteristics of traffic flow patterns for each section.

- Previous traffic volume data in ANE
- Traffic volume and roadside OD survey in May and August, 2009 at three locations in Cuamba, Mandimba and Lichinga on the Study Road
- OD survey at four borders between Mozambique, Malawi and Zambia
- Interview survey of stakeholders both in Mozambique and Malawi

This section is used for passenger movement from Lichinga and other districts in Niassa to connect railway or Nampula province. Regarding goods transportation, some consumer goods are dispatched from Cuamba to Lichinga. On the other hand, most consumer goods for Cuamba city come from the Nampula side mainly by railway.

2. Methodology of Traffic Demand Forecast

The Study Team applied the socio-economic framework based on the development strategy in Niassa (PEP), and the concepts of forecast methodology as three different types of traffic;

Passenger traffic volume is estimated by "Gravity Model" with the variable index of potential population and road section impedance, developed by the actual number of passengers for each O-D trip.

Regional traffic volume is considered by dividing traffic as attraction and generation for each zone. Trip attraction is estimated by the consumption of daily goods, and trip generation is based on the agro-products from Niassa Province.

International traffic volume is thought to be generated after the road network is improved. It is estimated by the Malawi trade and railway capacity, and applies the corridor choice model, named lodgit model.

3. Results of Traffic Demand Forecast

Accumulating the results of each component, future traffic volume for both sections will be summarized. For the section of Cuamba – Mandimba, future traffic volume in AADT is estimated at about 457AADT in 2014, 1,481AADT in 2023 and 5,027AADT in 2033 in the "with" case.

The section of Cuamba - Mandimba is characterized by the numbers of trailers that will be diverted from Beira corridor and railway. It is evidenced that this section will be composed of a part of international corridor.

Compared with the previous feasibility study between Nampula and Cuamba, this estimated traffic volume is almost the same level of volume as for the previous section.

4. Economic Analysis

Economic analysis is conducted on the following assumptions:

Analysis Tool : HDM-4 (RED, Comprehensive for reference)
Project life : 20 years after the opening of the project road (2014)
Pricing date : as of October 2009
Social discount rate : 12%
Conversion Factor : Construction work (0.84), Maintenance work (0.75)
Exchange rate : US$1.00 = 28.00 Meticais (MT)

Results of analysis are tabulated as follows:

Sensitivity Analysis

Case	Assumptions	EIRR
Base	Upgrade to paved road with DBST with Lichinga-Mandinba intervention	19.5%
1	Decrease in traffic volume of -20%	16.6%
2	Increase in investment costs of +20%	16.9%
3	Combination of above as the worst case	14.3%

The Project scores an average level as an upgrade-to-paved intervention and its economic viability is acceptable, with an EIRR of over 12% of the opportunity cost among alternatives. Based on this result, the Project is 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 Team concludes that the road upgrading project is economically feasible in terms of the national economy of Mozambique.

Part V Cross Border Facilities

1. Baseline Study and Fact Findings for Upgrading Border Facilities:

Upgrading of facilities at Mandimba-Chiponde border post was assessed in terms of its needs and requirements in conformity with baseline study and facts found upon the following issues.

- Current Conditions of Borders at Mozambique-Malawi
  - Cross Border Traffic
  - Control System and Facility
- Characteristics of Mandimba-Chiponde Border
  - Geographical and Commercial Features
  - Interactions and Border Communities
  - Strategic Importance on Regional Corridor Development
  - Site Conditions and Facilities
- Strategy for Upgrading Border Control and Facility
  - SADC Regional Strategy
  - Mozambique-Malawi Bilateral Strategy

2. Implementation Approach for Upgrading Border Facilities:

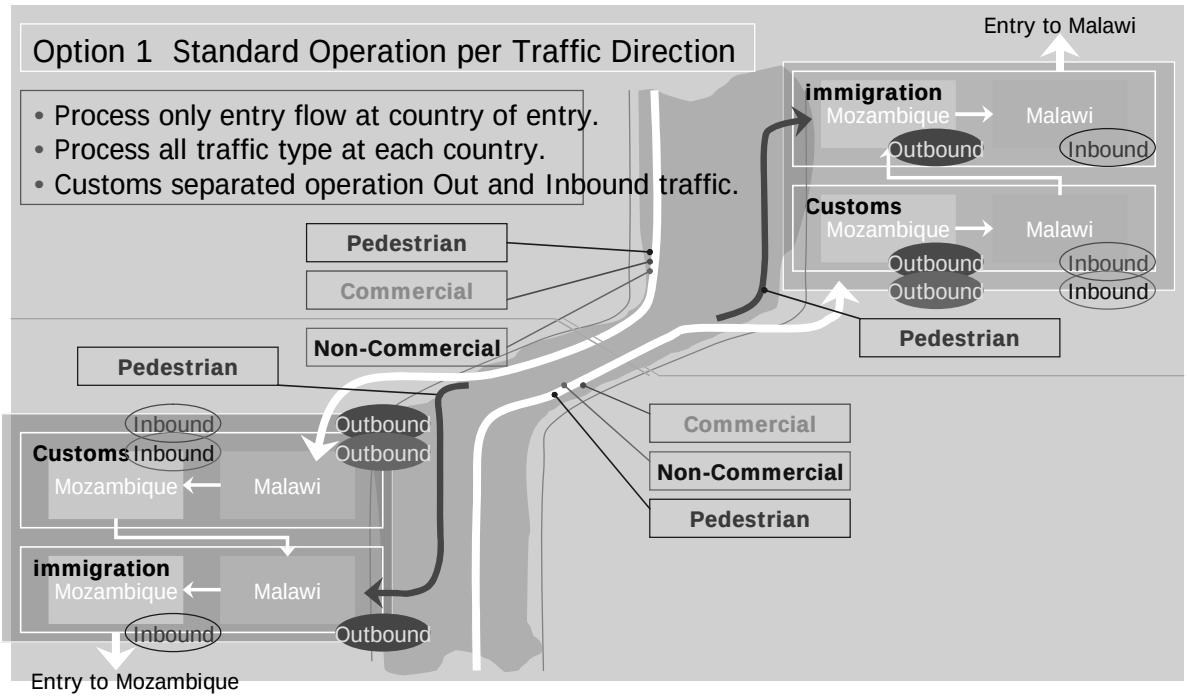
Implementation approach was formulated with the following proposals:

- Phased introduction for OSBP shall be employed,
- Existing facility shall be practically adapted and utilized under the environment of OSBP operation,
- Phased introduction shall be examined in line with: i) magnitude of future demands of cross border traffic and year forecasted, ii) time schedule of the bilateral discussion and the agreement, and iii) time schedule to introduce OSBP environment to other borders.

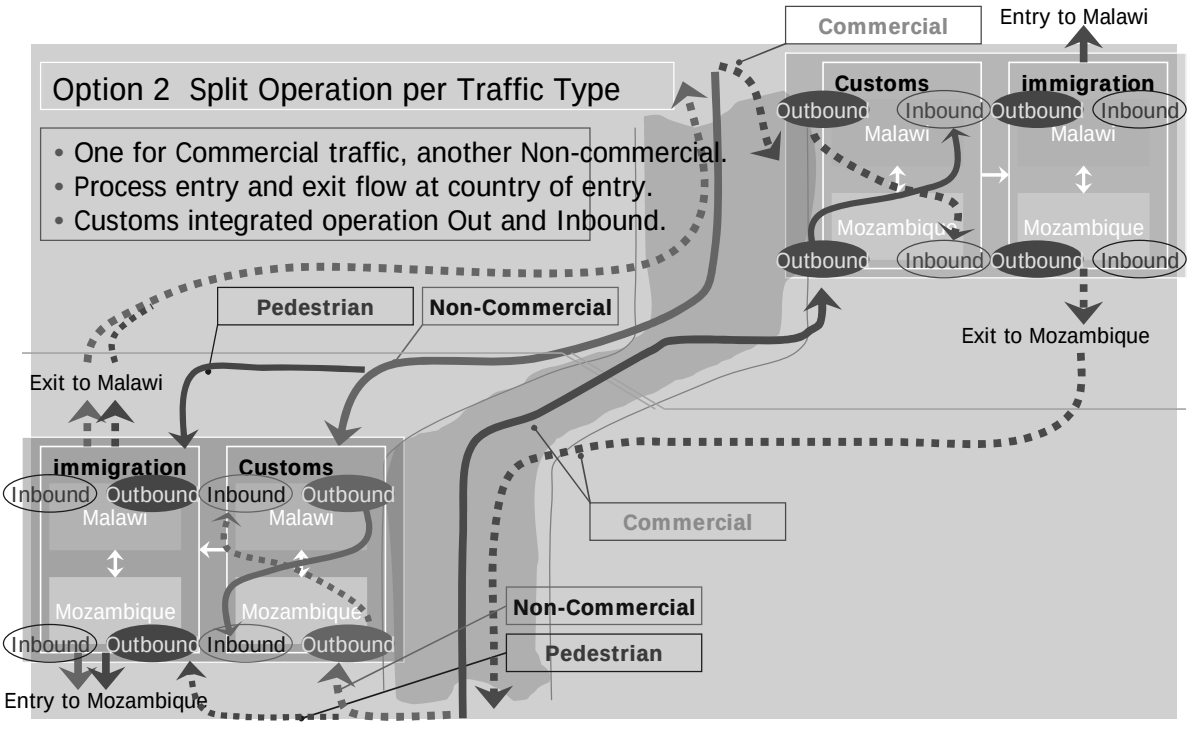
3. Implementation Policy for Upgrading Border Facilities:

"**Two-step upgrading**" as competitive scenario and "**Juxtaposed facility model**" were technically selected for the phased introduction of OSBP. And facility planning was preliminarily formulated estimating provisional conditions such as border control procedures and performance benchmarks (target time release, total processing time, unit workforce etc.) to be applied for OSBP operation.

Two types of operational options for OSBP scheme were proposed and preliminary layout and facility size were proposed for two target years according to "Two-step upgrading," that is, 2014 as the first step and 2024 as the second step introduction:



Option 1: Split Operation per Traffic Direction



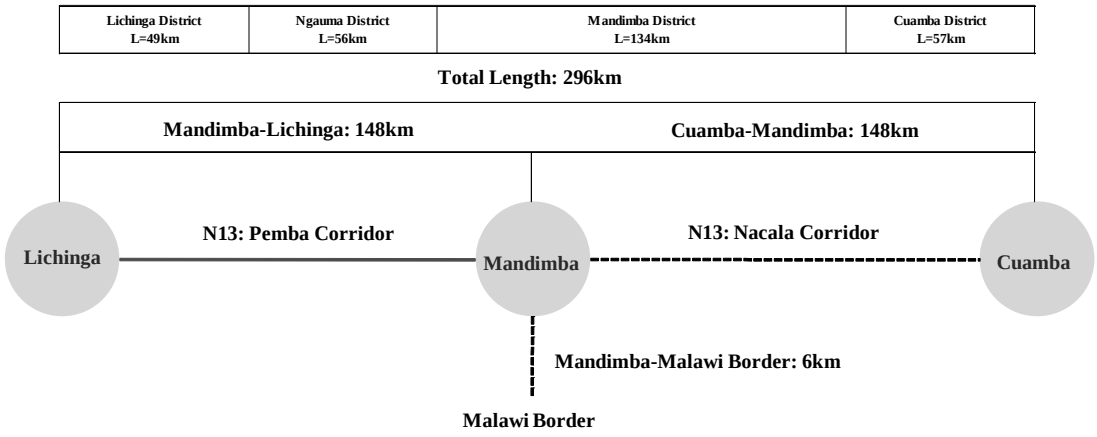
Option2: Split Operation per Traffic Type

[Mandimba-Lichinga Section]

Part III Preliminary Engineering Design

1. General Observations

As shown in Figure 1.1.1, the Study Road, with a total length of approximately 148km, traverses three districts having high agricultural potential, namely Mandimba, Ngauma and Lichinga in Niassa Province. The Mandimba-Lichinga road is part of the Pemba Corridor.



Outline of the Study Road

2. Natural Condition Survey for the Study Road

The aim of the natural condition survey is to confirm the existing natural conditions for the Study Road with a view to making a road design. Natural condition survey is composed of the following three components:

1) Topographic survey (Aerial survey, Bridge survey, Benchmark setting), 2) Geological survey, and 3) Soil & material survey.

3. Hydrology and Hydrological Analysis

Following table shows the results of the flood level calculation by the HEC-Ras, which is based on the calculation for non-uniform flow.

Bridge	Return Period	Discharge (m3/s)	Calculated Flood Level (m)	Results of Field Survey (m)
Ngame I	50-Year	225.6	731.10	732.9
	100-Year	278.9	731.68	
Lilasse	50 Year	277.3	892.76	893.2
	100 Year	342.7	893.01	
Ninde	50-Year	256.6	902.47	902.9
	100-Year	316.9	902.75	
Luculumesi	50 Year	716.2	992.98	990.0
	100 Year	885.0	993.63	
Lutembue	50-Year	310.9	1045.64	1043.9
	100-Year	384.7	1046.01	
Luambala	50 Year	463.2	1107.61	1105.5
	100 Year	576.5	1108.09	

4. Applicable Design Standards

The application of a proper design standard will ensure that the following objectives are achieved:

- Ensure safety, a high standard service level and comfort for road users by the provision of adequate sight distance and roadway space,
- Ensure that the roadway is designed economically
- Ensure uniformity in the design
- Ensure safety of the structures (bridges and culverts).

The Study Team proposed to use the Southern Africa Transport and Communications Commission (SATCC) design standards, as these were commonly used for other projects in the region. The Lichinga- Montepuez Road is also subject to the SATCC design standards.

5. Preliminary Engineering Design

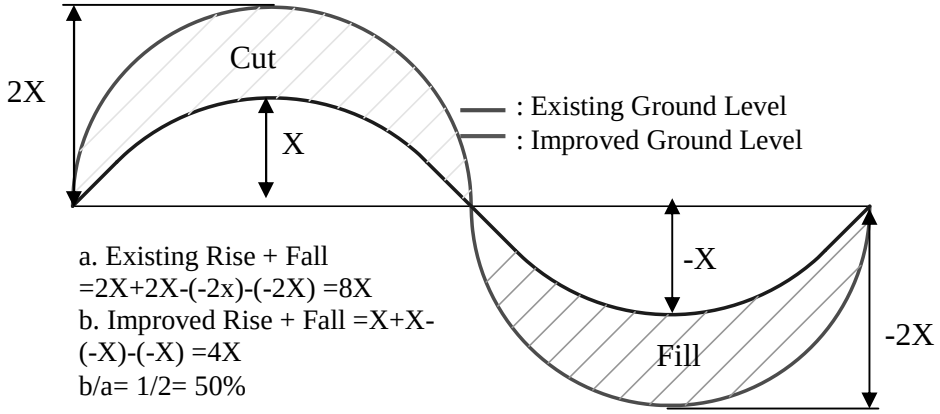
Through discussions with ANE and the results of field surveys by the Study Team, the concept of the Project was confirmed as follows:

- To create an efficient primary road connection securing smooth traffic flow throughout the year corresponding to the future traffic demand
- To create a safe primary road connection by reducing the risk of accidents and the rate of injuries to pedestrians by motorized vehicles

(1) Recommendable Alignment

The following table shows the improvement magnitude and effect of the recommended alignment. In regard to the section between Mandimba and Lichinga, although the horizontal alignment almost meets criteria for a design speed of 80km/h, the vertical alignment should be improved more than 50% for meeting a design speed of 80km/h as shown in following figure. This means that this section should be improved on large scale.

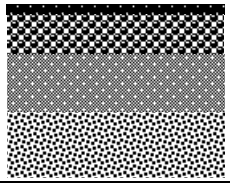
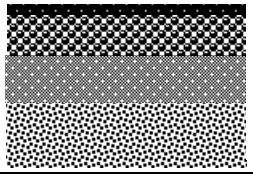
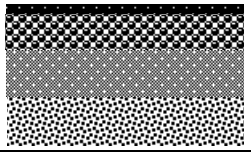
			Existing	Plan
Length (km)			148.1km	148.6km
Terrain			Rolling and mountainous	Rolling and mountainous
Design Speed			-	80km/h
Geometry	Horizontal Curvature	deg/km	164.1 (1.00)	174.8 (1.07)
	Rise + Fall	m/km	55.8 (1.00)	24.2 (***0.43***)
	No. of Rises + Falls	no./km	3.1	2.8



Improvement Image of the Vertical Alignment

(2) Suitable Pavement Compositions

A mechanistic analysis using ELSYM5 was conducted according to the design CBR. The results of the analysis are as shown in following table.

S2 (3-4)	***S3 (5-7)***	***S4 (8-14)***
 200 / 250 / 250	 200 / 200 / 250	 150 / 200 / 200

: G4 Crushed or Natural Gravel Base Soaked CBR>80%@98% mod. AASHTO density

: C4 Cemented stabilized Sub-base 0.75-1.5Mpa@100% mod. AASHTO density

: G7 Selected Layer Soaked CBR>15%@93% mod. AASHTO density

Poisson's ratio & Elastic coefficient (Elastic coefficient = (10 x CBR)Mpa)

G4: 0.35, Phase-I: 400Mpa, Phase-II: 400Mpa, Phase-III: 300Mpa

C4: 0.25, Phase-I: 1500Mpa, Phase-II: 600Mpa, Phase-III: 300Mpa

G7: 0.35, Phase-I: 150Mpa, Phase-II: 150Mpa, Phase-III: 150Mpa

(3) Bridge Design

By the discussion with ANE, bridge inner width has been set as 9.2m for two-lane bridges. Those are summarized in following table.

General		Existing bridge			New bridge			
No.	name	width	length	existing	lane	width	length	from existing Br.
(Mandimba)								
5	Ngame-I	4.2	28.0	demolish	2-lane	9.2	30	same position
6	Lilasse	4.0	10.0	demolish	2-lane	9.2	17	same position
7	Ninde	4.1	31.0	demolish	2-lane	9.2	34	down stream 8m
8	Luculumesi	4.4	22.0	demolish	2-lane	9.2	34	down stream 8m
9	Lutembue	4.1	34.0	demolish	2-lane	9.2	34	down stream 8m
10	Luambala	4.2	22.0	demolish	2-lane	9.2	30	up stream 8m
(Lichinga)								

6. Construction Planning

The construction plan was proposed for improvement of Mandimba - Lichinga road on N13 including construction method, procurement of material and equipment, and construction schedule according to site condition, structural scale and work quantities.

7. Project Implementation Plan

Project implementation plan was proposed based on some constraints affecting the schedule as shown below:

- Selection of consultant for D/D will require four months procedure and preparation of D/D and tender documents will require minimum six months.
- Preparation of environmental impact assessment and RAP will require about eight to nine months and will be submitted to a donor 120 days prior to the submission of the appraisal report and loan agreement of the Project.
- Tendering for construction contractor will require minimum nine to ten months procedure including pre-qualification, tender announcement, tender preparation of 90 days limitation and tender evaluation and approval by ANE and lending agencies
- Construction work and supervision service will require about three years (33 months)

The GOM/ANE is willing to make a request to apply for this Project as NEPAD project or component of the Cuanma-Mandimba Road Project. NEPAD project has to contribute to enhancing regional economic integration as a multinational project. However, the function of the Lichinga-Mandimba Road is not international trunk road linking other countries but rather essential road for regional development of Niassa Province.

For the reasons mentioned above, the possibility of applying this Project as NEPAD project will not be high. In that case, the GOM/ANE should consider a phased improvement in line with the existing road conditions and regional development program.

8. Project Cost Estimate

Basically unit construction cost of “Upgrading of Nampula – Cuamba Road” (hereinafter referred as “NCR”) is utilized for the Estimate due to high similarities between the two projects as follows.

- Site location: The Project Road is the extension of NCR beyond Cuamba in northern region.
- Time of estimate: Engineering estimate of NCR was finalized at its detailed design stage in April 2009.

The results of the Estimate are summarized in following tables.

Description		Final (USD)
		DBST
1000	General	28,083,346
2000	Drainage	11,519,383
3000	EW & granular layers	66,843,578
4000	AC & seals	14,259,205
5000	Ancillary	3,578,272
6000	Structures	5,797,170
7000	Test & QC	17,250
8000	Others	1,997,534
	Total (Bill A: Road)	**132,095,738**
	Bill B: Day works	1,136,023
	Bill C: Social issues	1,241,700
	Bill D: Environmental	330,239
	Total (Bill A to D)	**134,803,700**
	Contingencies (10%)	13,480,370
	IVA (6.8%)	10,083,317
	Total construction cost	**158,367,387**
	Engineering cost (5%)	7,414,204
	IVA (6.8%)	504,166
	Total project cost	**166,285,757**
	Compensation cost	199,391

Project cost per km	**1,121,868**

9. Road Maintenance Systems

ANE's ten provincial delegations are responsible for the implementation of all maintenance works on classified roads. The Directorate of Maintenance has a crucial role in ensuring that the delegations in provinces are fully aware of and complying with the technical and operational guidelines for implementation of the annual maintenance plan; and that roads of all types (primary, secondary, tertiary, vicinal, paved, unpaved) are being maintained and provided .

Part IV Traffic Demand Forecast and Economic Analysis

1. Existing Traffic Flow Patterns

The Study Team conducted the following surveys and research to recognize the characteristics of traffic flow patterns for each section:

- Previous traffic volume data in ANE
- Traffic volume and roadside OD survey in May and August, 2009 at three locations in Cuamba, Mandimba and Lichinga on the Study Road
- OD survey at four borders between Mozambique, Malawi and Zambia
- Interview survey with stakeholders in both Mozambique and Malawi

This section is the only route for delivering consumer goods to Lichinga, which is the provincial capital of Niassa, which is the base for distributing to the northern part. This section can be said to be the lifeline for the northern area. The majority of social and official movement is along the OD-pair between Lichinga and Cuamba.

2. Methodology of Traffic Demand Forecast

The Study Team applied the socio-economic framework based on the development strategy in Niassa (PEP), and the concepts of forecast methodology as three different types of traffic:

Passenger traffic volume is estimated by "Gravity Model" with the variable index of potential population and road section impedance, developed by the actual number of passengers for each O-D trip.

Regional traffic volume is considered by dividing traffic as attraction and generation for each zone. Trip attraction is estimated by the consumption of daily goods, and trip generation is based on the agro-products from Niassa province.

International traffic volume is thought to be generated after the road network is improved. It is estimated by the Malawi trade and railway capacity, and applies the corridor choice model, named lodgit model.

3. Results of Traffic Demand Forecast

Accumulating the results of each component, future traffic volume for both sections will be summarized. For the section of Mandimba – Lichinga, future traffic volume in AADT is estimated at about 467AADT in 2014, 1,732AADT in 2023 and 6,417AADT in 2033 in the "with" case.

The future AADT of section between Lichinga – Mandimba is more than Mandimba – Cuamba. It is because social communication will be more active by minibus and passenger car to the connection of provincial capital in Lichinga.

Compared with the previous feasibility study between Nampula and Cuamba, this estimated traffic volume is almost the same level of volume as for the previous section.

4. Economic Analysis

Economic analysis was conducted on the following assumptions:

Analysis Tool : HDM-4 (RED, Comprehensive for reference)
Project life : 20 years after the opening of the project road (2016)
Pricing date : As of October 2009
Social discount rate : 12%
Conversion Factor : Construction work (0.84), Maintenance work (0.75)
Exchange rate : US$1.00 = 28.00 Meticais (MT)

Results of analysis are tabulated as follows:

Sensitivity Analysis

Case	Assumptions	EIRR
Base	Upgrade to paved road with DBST (revised cost)	18.1%
1	Decrease in traffic volume of -20%	15.4%
2	Increase in investment costs of +20%	15.6%
3	Combination of above as the worst case	13.6%

The Project scores an average level as an upgrade-to-paved intervention and its economic viability is acceptable, with an EIRR of over 12% of the opportunity cost among alternatives. Based on this result, the Project is 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 Team concludes that the road upgrading project is economically feasible in terms of the national economy of Mozambique.

Part VI Environmental and Social Considerations

1. Environmental Law and Relevant Guidelines

The Government of Mozambique has issued laws relevant to the environment. According to the EIA Law, all project proponents must obtain environmental certification from the approval organization which is the Ministry of Environmental Coordination (hereinafter referred to as "MICOA"). This environmental law prescribes that rural road rehabilitation projects are classified as "category A" projects, which require an EIA basically. With regard to Malawi side, the Part V in Environmental Management Act 1996 says, "A4.5 construction new road / widening of existing road of highway / rural road" requires EIA process. On the other hand, construction of immigration facilities is not prescribed in the mandatory list for EIA.

The environmental and social consideration survey based on the JBIC and JICA guidelines indicated that it seems serious environmental impacts are not expected, so far, however some key issues such as resettlement, elephant migration corridor and infectious disease items were picked up, and some mitigation measures were recommended from the Study Team.

2. Environmental Recommendations

The Study Team recommends the following:

[Implementation of Mitigation Measure against Key Issues]

- With regard to African elephant migration routes in the Study Area, signboards should be set up to warn drivers and inhabitants and environmental education should be conducted for construction workers and inhabitants by the proponent.
- In terms of resettlement, adequate law-based process under land law, RPF and other relevant guidelines shall be conducted. Especially, sufficient discussion for negotiation of price determination shall be carried out with stakeholders because the GOM does not have a prescribed compensation price list for structures and assets at the moment.

[Implementation of Adequate EIA]

- ToR for EIA which will be prepared by ANE should consider relevant guidelines such as GOM, JBIC, JICA and AfDB.
- The Study Report shall be referred and incorporated into the EIA report which will be prepared by ANE, especially analysis of elephants and quantitative pollution forecast in air quality and noise pollution

[Implementation of Required Environmental Process during Construction]

- Appropriate law-based processes shall be adopted for development of quarries and borrow pits during construction. Generally, development of new quarry site shall take environmental certificate from Provincial MICOA.

Part VII Regional Development Program

1. Present Situation and Development Potential of Niassa Province

Niassa Province has inherent development potential in agriculture, forestry, mining and tourism. However, poor access conditions have hindered economic development in the province. Furthermore, its territorial size, scattered population and low population density have made it difficult to deliver basic social services to the people.

The majority of provincial population is rural and the majority of rural population is smallholding farmers (smallholders). They grow a variety of food crops including maize, cassava and beans. Poor access conditions increase transport costs. It is difficult for smallholders to transport their agricultural produce by car and sell them at market places. As a result, smallholders have to wait for middlemen to come to their villages or they need to bring produce to nearby buying places by bicycle or on foot. Moreover, in order to satisfy cash needs, they have to sell part of food crops for their own family consumption.

Some smallholders grow cash crops, such as tobacco and cotton. On the other hand, in recent years, in the southern part of Niassa Province, where access conditions are relatively good because of its railway linkage, some smallholders grow sesame for export in the activities of agricultural associations. However, these kinds of cash cropping are still limited in number and to certain areas.

Agriculture is a major and important economic sector, which provides food and cash for the majority of people in the province. In Niassa Province, there is much room for improvement of agriculture in technical production and commercialization. Furthermore, agro-processing industries are expected highly not only to increase the demand for local agricultural produce, but also to increase non-agricultural employment.

In the northern part of Niassa Province, since 2005, industrial tree plantations have been increasingly developed by foreign investments. Harvesting of trees will start at those plantations around 2013. Those harvested wood and/or locally processed wood products would be exported to other regions. In the short term, they rely on road transport from Lichinga to Cuamba to get railway at Cuamba. In the mid and long terms, it is expected that the railway line between Cuamba and Lichinga could be rehabilitated so as to transport unprocessed wood or processed wood products to Cuamba and further to Nampula or to Nacala, sometime to Malawi.

In Niassa Province, Niassa Lake in the north-western area and Niassa Reserve in the north-eastern area have tourism potential. Lichinga, provincial town of Niassa, has beautiful streetscape due to Portuguese colonial legacy. Lichinga has development potential to be a base for tourist accommodation. Such tourism potential including tourist resorts, water sports, ecotourism and game hunting has been hardly exploited yet.

It has been known that the north-western area of the province has mineral resources including coal. However, high transport costs have hindered exploration and development of mineral resources.

2. Regional Development Measures for Promoting Synergy Effect of Trunk Road Improvement and Regional Development

(1) Corridor along Cuamba-Mandimba Trunk Road: Southern Part of Niassa Province

Smallholder Agriculture and Agro-Processing Industries

The upgrading and pavement project of Cuamba-Mandimba Road could reduce transport costs, as well as improve road access along the corridor. As a result, regional potential to commercialize smallholder agriculture and to expand their production would be enhanced. However, such road upgrading alone cannot realize the enhanced regional potential and achieve smallholder commercialization and production expansion. Therefore, it is necessary to assist in strengthening their agriculture associations and securing market channels for their produce.

The upgrading and integration of Cuamba-Mandimba Road with already upgraded Nampula-Cuamba Road would substantially reduce long-distance transport costs by truck so as to reduce goods prices imported from other regions.

It is considered that such smallholder commercialization and agricultural production expansion would increase business potential of agro-processing industries along the corridor. However, such road upgrading alone is not enough to exploit improved opportunities in agro-processing industries. It is essential to assist in not only feasibility studies but also business development services, for providing information and support to private sectors. Such measures would help private sectors to actually invest in the field of agro-processing.

Urban Economy and Logistics Function

The integrated upgrading of trunk roads of Nacala Development Corridor would vitalize regional economy along the corridor. This could promote geographical expansion of commercial catchments Nampula Town and Nacala Town, resulting in upgraded commercial agglomeration.

Similarly the inland towns, such as Cuamba Town and Mandimba Town, would expand their commercial catchments and increase demands for transport and logistics sectors.

In addition to the upgrading of Nampula-Cuamba-Mandimba Road, development of bypass roads, logistics centers and loading-unloading facilities between roads and railways would be necessary for making regional transport more effective and efficient by taking advantage of upgraded trunk roads and rehabilitated railway of Nacala Development Corridor.

(2) Periphery of Nacala Development Corridor: Central and Northern Parts of Niassa Province

Smallholder Commercialization and Production Improvement

Commercialization of smallholders in the periphery of Nacala Development Corridor would be encouraged by the road improvement between Nampula, Cuamba and Mandimba. Due to the reduced long-distance transport costs, the farmers would be able to sell their agricultural products at higher prices. As the economic activities in Nacala Development Corridor are vitalized with the trunk road improvement, populations of Cuamba Town and Mandimba Town would

increase. As a result, the amount of agricultural products to be dealt with by the middlemen would increase. Currently the support to the smallholder commercialization by organizing agricultural associations and by making linkage with marketing companies is provided in a limited number of villages in the southern part of the province. In order to make full use of the enhanced opportunities for smallholder commercialization, such support should be expanded to the central and northern parts. In addition, agricultural technical support should be introduced to improve their production.

Tourism Development

If the road between Nampula, Cuamba and Mandimba is improved, tourists visiting southern part of the Province from Malawi or Nampula by bus or car would increase. It is expected that Lichinga would be developed as a comfortable tourist base to provide accommodation to tourists, traveling along the route via Cuamba and Mandimba. Measures should be taken to improve the quality of tourism services in hotels, restaurants and car rentals, as well as to provide tourist information in Lichinga Town. Furthermore, efforts should be made to attract tourists to make trips from Lichinga to nearby tourist spots such as Niassa Lake and nature conservation areas.

In order to fully develop tourism in Niassa Province to such an extent that more international and domestic tourists would visit Niassa Lake and/or Niassa Reserve as popular tourist destinations, good access conditions should be ensured with improved Mandimba-Lichinga Road. In combination with the road improvement, it is necessary to make Lichinga Town an attractive tourist center, by providing small tourist-oriented facilities, such as tourist information centers, museums and sign boards. It is also necessary to start developing the capacity of local tourist industries by providing training programs. More tourist accommodations and attractions should be developed at Niassa Lake and Niassa Reserve. For facilitating tourism development at the provincial level and for promoting tourism in Niassa Province, it is also recommended to establish a local tourism board involving government and private sectors.

Development of Wood Processing Industry

Improvement of Mandimba-Lichinga Road is essential for promoting industrial development, such as wood-processing industries, in the central and northern part of Niassa Province. The road improvement would largely contribute to cost reduction of long-distance truck transport and furthermore to price reduction of imported goods, such as spare parts and fuels. This could lead to enhancement of basic conditions for attracting industries.

For actual promotion of wood-processing industries, business development services should be provided for foreign investors and companies. Furthermore, it is also necessary to develop small and medium scale enterprises (SMEs) of wood-processing for local employment generation.

Mineral Resources Development

The improvement of Lichinga-Mandimba Road is essential to realize mineral resources development in the north-western area of the province. Together with the road improvement, geological surveys and research is important to provide information on mineral resources availability to promote private investment in mineral exploration and furthermore in mineral exploitation. In the long term, rehabilitation of Lichinga-Cuamba Railway Line is highly expected for

transporting exploited mineral resources through Cuamba, Nampula and Nacala.

Improvement of Social Services

In addition to the above-mentioned economic development measures, the improvement of social services, such as water, education and health, as well as the improvement of local roads are very important for the regional development in the central and northern parts of Niassa Province. In the decentralization policy of Mozambique, budgets for the development are allocated to district governments, and they are supposed to play central roles in planning and implementation for local development. However, their capacity is limited. In order to improve social infrastructure and services, assistance programs for capacity development of district governments are necessary.

The Preparatory Survey on Road Improvement Plan in Nacala Development Corridor (N13: Cuamba-Mandimba-Lichinga) in the Republic of Mozambique

Final Report

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Abbreviation

AADT	Annual Average Daily Traffic
ACE	Competent Authority of Road Sector
ACV	Aggregate Crushed Value
ADT	Average Daily Traffic
AfDB	African Development Bank
ANE	National Road Administration
AU	Africa Union
BOO	Build Own Operate
BOT	Build Operate Transfer
BOOT	Build Own Operate and Transfer
CBR	California Bearing Ration
CDN	Northern Development Corridor
CFM	Mozambique Railway Authority
CLUSA	Cooperative League of the U.S.A.
COI	Corridor of Impact
COMESA	Common Market for Eastern and Southern Africa
DA	Directorate of Administration
DCP	Dynamic Cone Penetration
DIMAN	Directorate of Maintenance of ANE
DIPRO	Directorate of Project of ANE
DNEP	National Directorate of Roads and Bridges
DPANE	Provincial Delegation of ANE
DPOPH	Provincial Directorate of Public Works and Housing
DTI	Department of Trade and Industry
EAC	East African Community
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ESCS	Environmental and Social Consideration Survey
EU	European Union
FDD	Full Due Diligence
FIP	Preliminary Information File
GAT	Cross Cutting Issues Unit (Environmental Unit in ANE)
GAS	Director of Assessor and Supervision Cabinet
GDP	Gross Domestic Product
GED	Cabinet for Development and Strategic Study
GOJ	Government of Japan
GOM	Government of the Republic of Mozambique
GPS	Global Positioning System
H.W.L	High Water Level
HDM-4	Highway Design and Maintenance Standards Model
HIV/AIDS	Human Immunodeficiency Virus /Acquires Immune Deficiency Syndrome
ICB	International Competitive Bidding
IDA	International Development Association
IND	National De-mining Institute
INE	National Statistics Institute
IRI	International Roughness Index
IRR	Internal Rate of Return
IUCN	International Union for the Conservation of Nature and Natural Resources
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency

MASL	Meter Above Sea Level
MCA	Multi Criteria Analysis
MCC	Millennium Challenge Corporation
MICOA	Ministry for Coordination of Environmental Affairs
MOAF	Ministry of Agriculture & Fisheries
MODP	Ministry of Development & Planning
MOIC	Ministry of Industry & Commerce
MOPWH	Ministry of Public Works and Housing
MOTC	Ministry of Transport & Communication
MTEF	Medium Term Expenditure Framework
NCB	National Competitive Bidding
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NPV	Net Present Value
OSBP	One Stop Border Post
OD	Origin and Destination
PAC	Environmental Accompanying Plans
PAP	Project Affected Person(s)
PARPA	The Action Plan for the Reduction of Absolute Poverty
PEP	Provincial Strategic Plan
PES	Economic and Social Plan
PGA	Environmental Administration Plan
PPP	Public-Private Partnership
PRISE	Road Sector Integrate Program
RAP	Resettlement Action Plan
RECs	Regional Economic Communities
RED	Roads Economic Decision Model
RF	Road Fund
RMF	Regional Maximum Flood
ROW	Right of Way
RPF	Resettlement Policy Framework
RSS	Roads Sector Strategy 2007-2011
SADC	Southern African Development Community
SATCC	the Southern Africa Transport and Communications Commission
SAWPB	Semi Annual Workplan and Budget
SEA	Strategic Environmental Assessment
SDI	Spatial Development Initiatives
SISTAF	Ministries of Finance and Planning and Development in the Government's financial management system
SIDA	Swedish International Development Cooperation Agency
SMEs	Medium-scale National Entrepreneurs
SMP	Strategic Maintenance Plan
SPT	Standard Penetration Test
STD	Sexually Transmitted Disease
SWOT	Strength, Opportunity, Weakness and Threat
TMH	Technical Measures for Highways
TRH	Technical Recommendations for Highways
TOR	Terms of Reference
VEF	Vehicle Equivalent Factor
VOC	Vehicle Operation Cost
WB	The World Bank

Part VII Regional Development Program

Chapter 1 Introduction

1.1 Objectives of the Study Component of Regional Development Program

1.1.1 Regional and Local Development

Main part of this Study is to conduct feasibility studies on upgrading the two trunk road sections. One is between Cuamba and Mandimba and the other is between Mandimba and Lichinga. In addition to the feasibility studies, one of the important components of this Study is to formulate a regional development program.

This is partly because the perspectives of regional and local development are very important for planning and designing of road upgrading between Lichinga-Mandimba-Cuamba.

That is also partly because regional and local development effort is significant for efficiently increasing and widely distributing the benefits to be created by road upgrading between Lichinga-Mandimba-Cuamba.

1.1.2 Road Development Strategies from Different Levels of Perspectives

Road development strategies in Niassa Province, especially for Lichinga-Cuamba-Mandimba, need to be formulated from four different levels of perspectives:

- National Level: from the perspective of national road system development of Mozambique
- International Level: from the perspective of international road connection among Mozambique, Malawi and Zambia (Nacala Development Corridor)
- Regional Level: from the perspective of regional development of Northern Mozambique (northern three provinces), with emphasis on regional development of Niassa Province
- Local Level: from the perspective of local development along the road within Niassa Province

These four levels of understanding of characteristics of the region enable us to evaluate the importance of the two road sections of Cuamba-Mandimba and Mandimba-Lichinga.

1.1.3 Strategies for Promoting Regional and Local Development, Taking Advantage of Trunk Road Development

Since the road upgrading projects of Nampula-Cuamba and Cuamba-Mandimba are huge investment, it is necessary and useful to make effort at increasing and distributing benefits of the road improvement to local communities and economy.

There have been already many initiatives for promoting poverty reduction and agricultural commercialization. Niassa Province has established Provincial Strategic Plan 2007-2017 (PEP 2007-2017), and districts have district strategic plans.

In order to complement and substantiate the existing development plans, we reviewed those existing and past development efforts, and proposed a regional and local development program in relation to the road upgrading of Lichinga-Mandimba-Cuamba and Nampula-Cuamba in the Nacala Development Corridor, and also in relation to other major road improvement, such as Lichinga-Marrema-Montepez-Pemba.

For formulating a regional and local development program, we paid attention to a variety of economic sectors, social services and infrastructure.

1.2 Structure of Part VII of the Study

Part VII is composed of the following four divisions:

- Introduction
- Review and Analysis of Present Situation and Existing Policies/Plans
- Regional Development Program
- Appendices

In the division on regional development program, a chapter (Chapter 12) is added for describing impacts of trunk road improvement of Nacala Development Corridor. Under these four divisions, 12 chapters and two appendices are organized as follows:

Division 1 Introduction

Chapter 1 Introduction

Division 2 Review and Analysis of Present Situation and Existing Policies/Plans

Chapter 2 National Policies and Development Plans

Chapter 3 Regional and Socio-economic Context of Niassa Province

Chapter 4 Economic Sectors in Niassa Province

Chapter 5 Infrastructure in Niassa Province

Chapter 6 Social Services in Niassa Province

Chapter 7 Urban Sector in Niassa Province

Division 3 Regional Development Program

Chapter 8 Nacala Development Corridor and Niassa Province: Understanding of the Region

Chapter 2 National Policies and Development Plans

2.1 Government Administrative System in Provinces

2.1.1 Overall System

In Mozambique, government administrative bodies at the local level are organized into 11 provinces and 131 districts.

A province is administratively divided into districts. A district is administratively divided into administrative posts. Furthermore, localities and villages are organized under each administrative post.

The provincial governor is the representative of the president of the republic at the provincial level. The governors are appointed by the president.

Administrators are heads of district administration and representatives of the provincial governor at the district level. The administrators are appointed by the provincial governor, in consultation with the central government.

At the provincial level, provincial directorates of sectors have offices, and administrative and technical staff. Provincial directors of provincial directorates used to be representatives of different sector ministers at the provincial level. Under the decentralization policy, those provincial directorates are under political and administrative guidance of provincial governors, while they are under technical guidance of sector ministries.

At the district level, district departments have offices, and administrative and technical staff. Heads of district departments of different sectors used to be representatives of provincial directorates of different sectors at the district level. However, under the decentralization policy, those heads of district departments are under administrative guidance of district administrators, while they are under technical guidance of provincial directorates of sectors.

2.1.2 Decentralization Policy – District Government

The legal framework of decentralization in Mozambique is based on the following laws:

- The Constitution of the Republic of Mozambique of 2004
- Law No. 8 on the State's administrative bodies decentralized at the local level of May 19, 2003 (LOLE: Law of Local Organs of the state)
- Decree No. 11 on the Regulation of the Law on the State's administrative bodies decentralized at the local level of June 10, 2005
- Decree No. 6 on the Organic Statute on District Governments of April 12, 2006; and
- Local Authority Package (Pacote Autárquico) consisting of Laws No. 2 on the Legal Framework for Municipalities of February 18, 1997, No. 11 on Finances and Assets of Municipalities, and No. 8 on the Organization and Functioning of the City of Maputo, all dated May 31, 1997.

Action Plan for the Reduction of Absolute Poverty II (PARAPA II) has made a step forward to decentralization, by focusing on district-based development. One of the three pillars of PARAPA II is a governance pillar, in which public sector reform on decentralization and district-based development is to be promoted by conducting the following actions:

- Approve and implement the decentralization strategy and plan
- Develop human resource skills at the district level
- Establish the capabilities of the infrastructure at the district level
- Develop planning and monitoring systems at the district level
- Strengthen the financial management skills of local government institutions

The Law 8/2003 (LOLE: Law of Local Organs of the state) defined the district as a budgetary unit, having power to prepare district development plans and define priorities. With the Law and followed Decrees, districts became centers of planning and implementation, though the methodological/technical guidance is provided by line ministries through provincial government.

In 2006 the government launched a scheme of directly providing districts with annual discretionary development funds, namely OIIL (Local Intiative Investment Budget). This scheme is so called "7 million" because the amount of the fund made available to each district is about 7 million MT.[1] Priority projects are selected in consultation with District Consultative Councils District formed by local representatives including traditional chiefs, religious leaders and civil servants. The budget has been used mostly for agriculture and small-scale industries, aimed at producing food and creating jobs.

In addition, the district governments receive 2 million MT per year as Fund for Investment Development (FID), which covers small-scale infrastructure investment including feeder roads, maintenance of schools, etc.

Provincial Directorate of Planning and Finance, together with other Provincial Directorates, guides and supports the District Government in the process of planning and budgeting. However the administrative capacity of Districts is still not developed enough to fulfill the expected roles, due to the limitation of human resources, technical capacity, and experiences.

[1] At present, 7 million Mozambique Meticals are equivalent to about US$265,000.

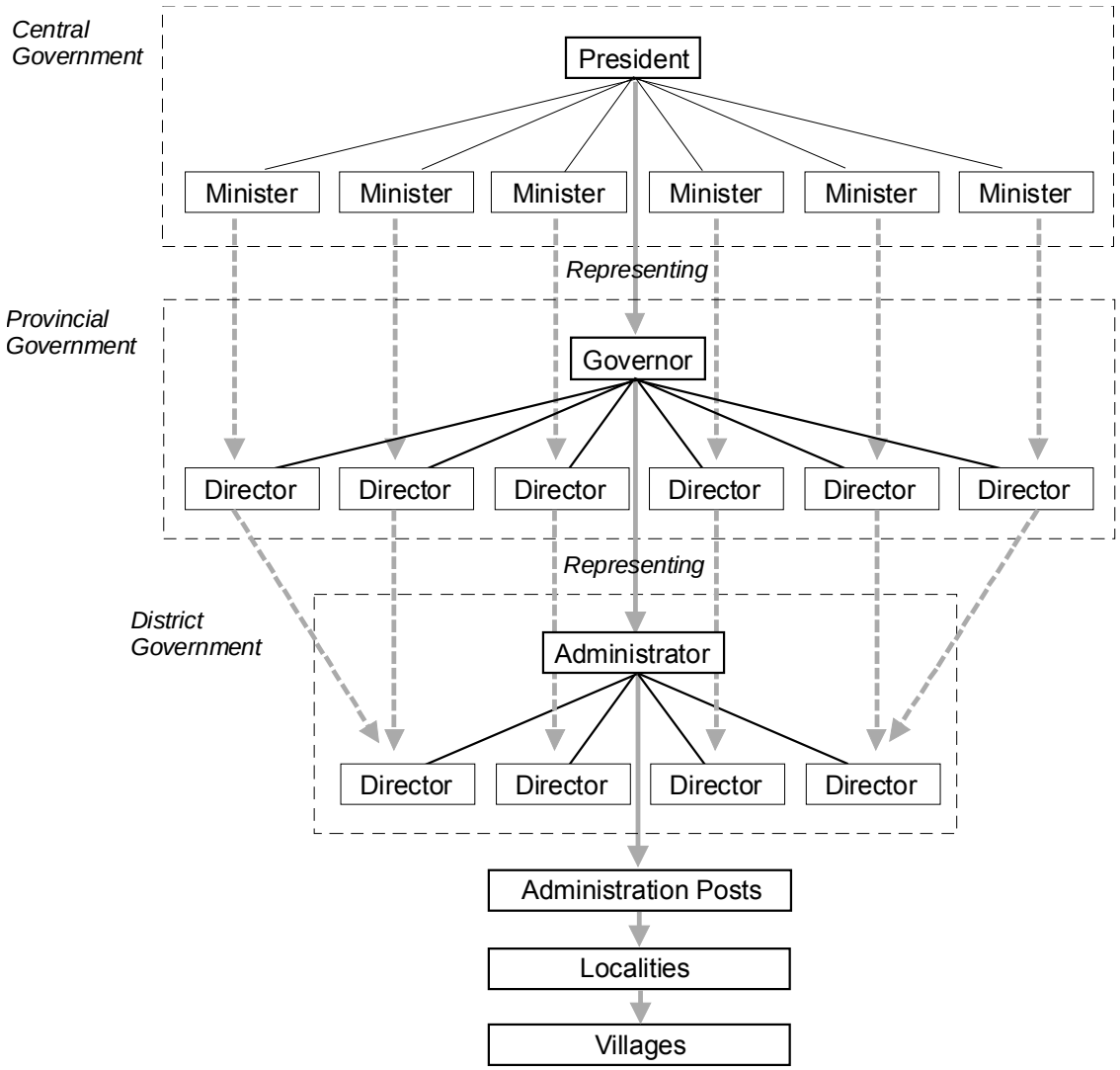


Figure 2.1.1 Structure of Government Administration at Provincial, District and Village Levels

Table 2.1.1 List of Government Institutions at Provincial and District Levels

Provincial Level Government Institutions
• Provincial Secretariat Office
• Provincial Directorate of Planning and Finance
• Provincial Directorate of Public Work and Housing
• Provincial Directorate of Agriculture and Rural Development
• Provincial Directorate of Industry and Trade
• Provincial Directorate of Health
• Provincial Directorate of Education and Culture
• Provincial Directorate of Coordination for Environment
• Provincial Directorate of Youth and Sports
• Provincial Directorate of Intelligent Services (SISE)
• Provincial Directorate of Notaries
• Provincial Directorate of Women and Social Welfare
• Provincial Directorate of Transport and Communications
• Provincial Directorate of Tourism
• Provincial Directorate of Labor
District Level Government Institutions
• District Secretariat Office
• District Services of Education, Science and Technology
• District Services of Health, Women and Social Action
• District Services of Planning and Infrastructure
• District Services of Economic Affairs covering Agriculture and Industry

2.2 Five-Year National Development Plan

2.2.1 Development Planning System of Mozambique

The Government of Mozambique has various tools of planning and implementation for promoting and guiding its development effort. One of the most important and basic plans is the Five-year National Development Plan.

Under the Five-year National Development Plan, medium-term programs and plans are to be prepared. Among them are Action Plans for the Reduction of Absolute Poverty (PARPA), sectoral plans and provincial strategic plans (PEP).

Moreover, for implementing those five-year and medium-term plans, annual operating plans, such as Economic and Social Plans (PES) and State Budget (OE), are prepared.

2.2.2 Five-Year National Development Plan 2005-2009

In March 2005, the Council of Ministers approved the Five-Year National Development Plan 2005-2009 (Programa Quinquenal do Governo para 2005-2009). Its central objective is to reduce absolute poverty by promoting social and economic development.

The government is to play key roles in promoting human resources development, infrastructure development, socio-economic development, institutional development and provision of basic services in order to create enabling environment for private investment and entrepreneur development.

The five-year development plan for 2005-2009 is to address various issues and policies in the following three priority areas:

- Human and Social Development

  1) Population, 2) Education, 3) Science, Technology and Innovation, 4) Health, 5) Access to Water, Sanitation and Living, 6) Women, Family and Social Action, 7) Culture, 8) Religion, 9) Sports, 10) Youth 11) National Freedom Fighters

- Institutional Development, Good Governance and Legal and Justice System Reform

  1) Public Sector Reform, 2) Justice Sector Reform, 3) Public Order and Security and Fighting Against Crime

- Economic Development

  1) Macro-economic Environment, 2) National Business Development, 3) Promotion of Job Generation and Training, 4) Agriculture, Livestock, Forests, Wildlife and Fisheries, 5) Rural Development, 6) Industry, 7) Commerce, 8) Construction, 9) Transport and Communications, 10) Tourism, 11) Mineral Resources, 12) Infrastructure Development, 13) International Trade and Regional Integration

- National Sovereignty Reform and International Cooperation

  1) Defense and National Sovereignty, 2) International Cooperation

2.3 Action Plan for the Reduction of Absolute Poverty (PARPA)

2.3.1 PARPA I

The first poverty reduction strategy paper for Mozambique was prepared in 2001 and it is called Action Plan for the Reduction of Absolute Poverty (PARPA) I.

PARPA I had the following priorities:

1) Human Capital Development through Education and Health
2) Improved Governance
3) Development of Basic Infrastructures

4) Agricultural and Rural Development
5) Better Macroeconomic and Financial Management.

2.3.2 PARPA II

The prime objective of PARPA II is to reduce the incidence of poverty from 54 % in 2003 to 45 % in 2009.

In addition to the same priorities of PARPA I (shown in the section above), PARPA II has emphasized two areas: i) Greater integration of the national economy and ii) Increase of productivity by implementing the following:

- Promotion of district-based development
- Creation of enabling environment for productive sectors
- Improvement of the financial system
- Measures to help small and medium-size enterprises to develop in the formal sector
- Improvement of both systems of revenue collection and budget allocation

In PARAPA II, development strategies are identified and organized into the following three pillars:

Pillar 1: Governance

i) Public Sector Reform
ii) Reform of the Justice System, the Rule of Law and the Public Order

Pillar 2: Human Capital

i) Education and Culture
ii) Health
iii) Water and Sanitation
iv) HIV/AIDS
v) Youth and Sports
vi) Women and Social Action
vii) Former Combatants
viii) Housing
ix) Food and Nutritional Security (SAN)
x) Science and Technology

Pillar: Economic Development

i) Macroeconomic Management
ii) Improving the Business Environment
iii) Development of the Financial System
iv) Promoting the Creation of a Strong, Dynamic, Competitive and Innovative Private Sector
v) Promoting the Priority Sectors, Broadening the Business Base and Creating Jobs
vi) Improving the Integration of Mozambique into the Regional and International Economy

The common theme behind these three pillars of development strategies is “the Building of the Mozambican Nation”.

Road upgrading of Nacala Development Corridor is closely related to "vi) Improving the Integration of Mozambique into the Regional and International Economy" pillar of economic development.

Regional and local development initiatives for Nacala Development Corridor are related to the pillar of human capital, as well as to economic development pillar.

The following eight cross cutting topics are also identified by PARA II:

- Gender
- HIV/AIDS
- Environment
- Food and Nutritional Security
- Science and Technology
- Rural Development
- Natural Disasters
- De-mining

2.4 International Corridor Initiatives

2.4.1 SADC Transport Corridors

In the 1980s, SADCC[1] gave high priority to development of "Corridors", which are major transportation routes of railways, roads and pipelines, connecting inland regions and land-locked countries with major sea ports. In 1997, SADC[2] identified seven such priority "Corridors" as shown in Table 2.4.1. [3]

Table 2.4.1 SADAC Transport Corridors

Corridor	Route	Major Issues on Transport
Southern Corridor	South Africa (Durban Port) - Botswana - Zimbabwe - Zambia- Congo	Due to increasing cargo demand and limited port capacity, Durban Port has been congested.
Maputo Corridor	Mozambique (Maputo Port) - South Africa	In order to handle increasing cargo volume due to industrial projects in the corridor, infrastructures of Maputo Port need further upgrading.
Walvis Bay Corridor	Botswana (Walvis Bay Port) - Karahari- Cabribi - Walvis Bay	Walvis Bay Port does not have enough depth of water to accommodate larger vessels.
Beira Corridor	Mozambique (Beira Port) - Zimbabwe	Because of rehabilitation of port infrastructure in the 1980s and 1990s, cargo volumes of Beira Port were on the increase. Since it is located in the River Pungue and Buzi estuary, Beira Port needs periodic dredging of navigational channels.
Nacala Corridor	Mozambique (Nacala Port) - Malawi - Zambia	Although CFM-North was rehabilitated in the 1990s, the railway infrastructure and

[1] Southern African Development Coordination Conference (SADCC) was established in 1980.
[2] Southern Africa Development Community (SADC) was established in 1992, by developing and reorganizing SADCC.
[3] High priority to development of corridors was confirmed by SADC Protocol on Transport, Communications and Meteorology. It was agreed that these seven corridors were in accordance with the protocol in a Protocol Implementation Workshop held in January 1997.

		rolling stocks need further modernization and upgrading. However, current cargo demand for the railway is not so large to justify further investment.
Tazara Corridor	Tanzania (Dar es Salaam Port) - Zambia	Cargo demand for the railway is gradually decreasing.
Lobito Corridor	Angola (Lobito Port) - Congo - Zambia	The railway has been destroyed.

These SADC priority corridors are identified and promoted by mainly focusing on transportation in order to enhance regional integration. Beira Corridor is a typical example of transport corridors, for which the government and international donors have focused on rehabilitation and upgrading of port, railway and roads, rather than supporting private sector developments in the corridor.

2.4.2 Spatial Development Initiatives (SDIs)

The Spatial Development Initiative (SDI) approach is different from a comprehensive development strategy based on government programs and projects. By the SDI approach, the government aims to develop or facilitate conditions conducive to private sector investment and public-private partnership (PPP).

The SDI methodology was developed by the Department of Trade and Industry (DTI) of South Africa in 1996. The SDI approach was applied to Maputo Development Corridor, in which a historic trade and transport route has been restored and developed between Maputo Port in Mozambique and inland landlocked provinces (Gauteng Province and Mpumalanga Province) of South Africa.

Based on this South African experience and increasing globalization, the Department of Trade and Industry (DTI) of South Africa has established a SDI support program for regional economic integration and development orienting to Southern African countries.

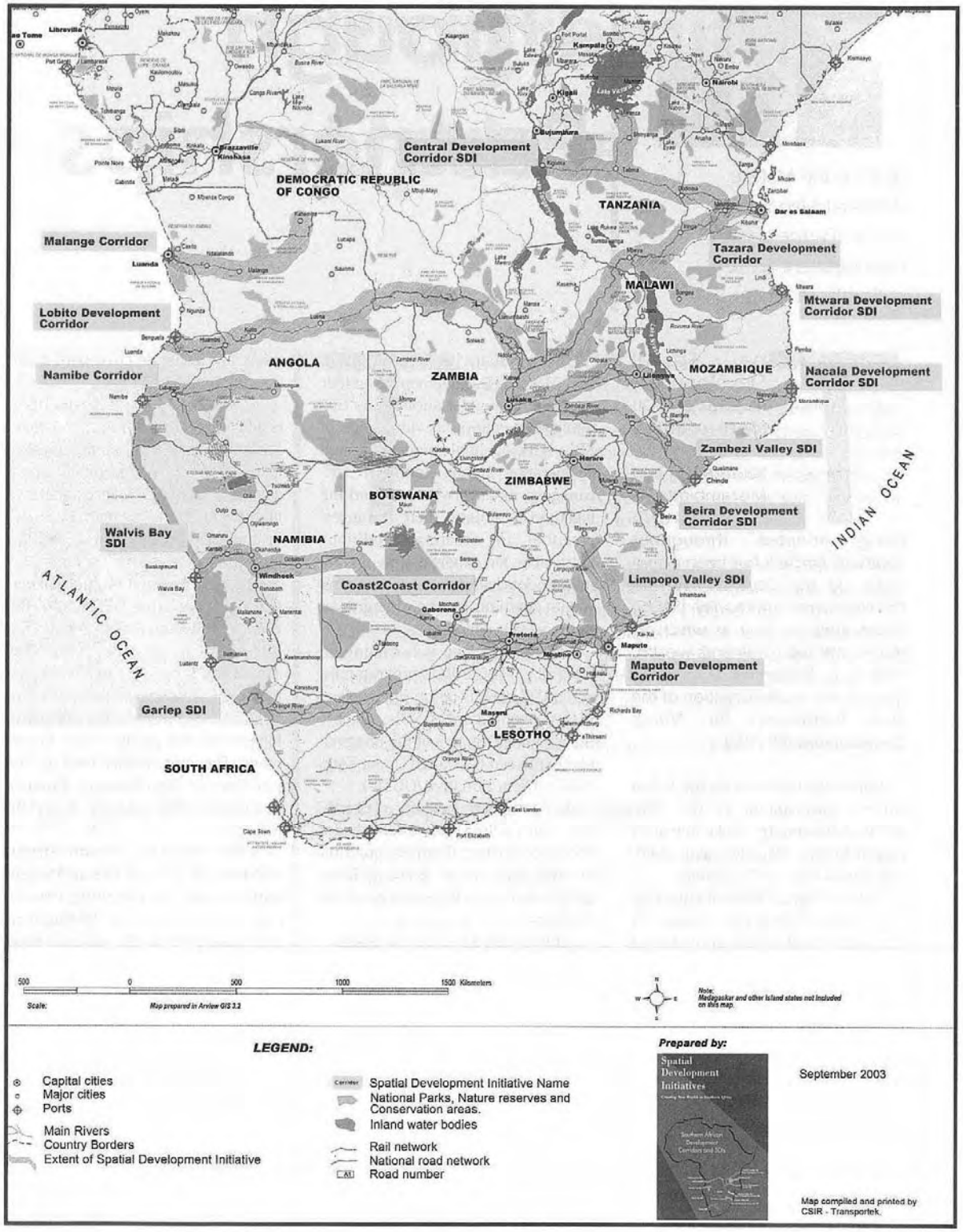
The SDI approach has identified various Regional SDIs in Southern Africa as shown in Table 2.4.2 and Figure 2.4.1.

Table 2.4.2 Development Corridors and SDIs in Southern African Region (Identified by Department of Trade and Industry of South Africa)

Development Corridors and SDIs	Geographically Related Countries	Port, Railway and Road
Maputo Development Corridor	Mozambique, Swaziland and South Africa	Maputo Port Maputo-Lavumisa: 263 km by Road Maputo-Johannesburg: 561 km by Road Maputo-Lavumisa: 240 km by Rail Maputo-Johannesburg: 575 km by Rail Maputo-Harare (via Chicualacuala): 1,230 km by Rail Maputo-Nacala: 2,100 km by Sea
Limpopo Valley SDI	Mozambique	Xai-Xai Port Railway is not connected to the port. Railway is not operational.

Beira Development Corridor	Mozambique and Zimbabwe	Beira Port Beira-Lubumbashi (via Harare and Lusaka)" 1,581 km by Road Beira-Blantyre (via Tete): 784 km by Road Beira-Blantyre (via Nsanje): 568 km by Road Beira-Lubumbashi (via Harare and Lusaka): 2,557 by Road Beira-Blantyre (via Nsanje): 580 km by Rail Beira-Lubunbashi (via Harare and Lusaka): 1,600 km by Rail and Road
Zambezi Valley SDI	Mozambique	Quelimane Port & Railway
Nacala Development Corridor	Mozambique, Malawi and Zambia	Nacala Port Nacala-Lusaka (via Lilongwe): 1,774 km by Road Nacala-Chipata (Malawi): 1,140 km by Rail Chipata-Lusaka (Zambia): 604 km by Road
Walvis Bay Development Corridor	Namibia, Botswana and South Africa	Walvis Bay Port Walvis Bay-Harare (via Maun): 2,409 km by Road Walvis Bay-Noordoewer (Namibia): 1,186 km by Rail Walvis Bay-Johannesburg (via Gobabis): 1,885 km Walvis Bay-Harare (via Maun): 2,395 km by Rail and Road Walvis Bay-Bujumbura (via Livingstone): 3,801 km by Road and Water
Gariep SDI	Namibia and South Africa	Alexander Bay & No Railway
Mtwara Development Corridor	Tanzania, Mozambique and Malawi	Mtwara Port & No Railway
Central Development Corridor	Tanzania and Rwanda	Dar es Salaam Port Das es Salam-Harare (via Lusaka): 2,491 km by Roads Dar es Salam-Blantyre (via Lilongwe): 2,027 km by Roads Dar es Salam-Kafue (Zambia): 2,025 km by Rail

Source: Spatial Development Initiative, September 2003
ARD-RAISE (2001), Southern Africa Transport Network: Comparative Transit Transport Cost Analysis



Source: Spatial Development Initiatives: Creating New Wealth in Southern Africa, September 2003

Figure 2.4.1 Development Corridors and Spatial Development Initiatives (SDIs) in Southern African Region

The Regional SDI Program has been an instrument of South Africa-Mozambique bilateral engagement on the SDIs listed above since 1996. Significant progress has been made for Maputo Development Corridor. SDIs for Zambezi Valley Development Corridor and Mtwara Development Corridor are in implementation. However, SDIs for Limpopo Valley Development Corridor and Beira Development Corridor and Nacala Development Corridor have been not so active due to unfavorable investment climate and other factors.[1]

2.4.3 NEPAD Corridors – NEPAD Spatial Development Programs (SDPs)

Southern African countries have neither welcomed nor accepted the concepts and programs of SDIs so well in the beginning, because the SDIs seemed to be designed by Department of Trade and Industry of South Africa in order to create enabling environment for investment and business of South African private companies.

On the other hand, NEPAD[2] recognizes the importance of promoting regional integration, which could accelerate economic development and growth. African Union (AU) and NEPAD initiated a regional infrastructure development program with the following objectives by assistance of African Development Bank (AfDB):

- Promotion of regional integration in the African continent to generate economies of scale
- Bridging of infrastructure gaps identified for promoting regional integration in Africa
- Promotion of sustainable regional economic development and trade

Regional infrastructure for integrating different countries is emphasized for the following reasons:

- Regional infrastructure enables to support large projects, which could attract more private sector investments.
- Efficient infrastructure networks generate new investments in other sectors.
- Weak infrastructure linkages result in Africa's low competitiveness in the global market.
- Individual countries of Africa are too small to generate and enjoy economies of scale usually found in larger markets.

In addition to the current SDIs in the Southern African Region, NEPAD and Regional SDI Program have identified the following 12 indicative Spatial Development Programs (SDPs) as the first pass in 2008.[3]

1. Maghreb Coastal

[1] Hudson Mtegha of MINTEK (2008), "Maputo Development Corridor: Case Study", PowerPoint Slide presented in NEPAD/SADC Infrastructure Projects Conference, 8th August 2008

[2] In July 2001, the New Partnership for Africa's Development (NEPAD) was launched by African leaders based on the belief that African leaders and African people have responsibility to promote poverty eradication, sustainable growth and development, and integration with global economy.

[3] Presentation Slides "The NEPAD Spatial Development Program (SDP)" to High Level Workshop held in Kampala, Uganda on February 28th 2008.

2. Rad Sea-Nile
3. Dibouti
4. Mombasa (Northern)
5. Madagascar
6. Bas Congo
7. Libreville Lomie
8. Douala
9. Gulf of Guinea Coastal
10. Sekondi Ougadougou
11. Canakry Buchanan
12. Niger: Dakar-Port Harcourt

2.4.4 Transformation from Transport Corridors to Development Corridors

The clear message of SDIs and successful achievement of Maputo Development Corridor have made a substantial and lasting impact on policies and programs of governments and international/bilateral donors. Rather than a conventional approach by government-led comprehensive development planning and implementation, the SDI approach is more promising when it includes 1) proposals of bankable packages containing both economic projects and infrastructure projects, and 2) government programs of strategic economic infrastructures.

Since any new initiatives based on private sector development, especially in underdeveloped regions of Mozambique are always exposed to severe competition in global markets, no programs have started initiatives for forming Development Corridors in line with the SDI approach yet, except for Maputo Development Corridor. That is, except for Maputo Development Corridor, any of the proposed Development Corridors have remained as Transport Corridors, but not as Development Corridors.

2.4.5 Success of Maputo Development Corridor

Among the proposed development corridors, Maputo Development Corridor (MDC) has been regarded as a successful development corridor initiative in various aspects.

In the Spatial Development Initiative for Maputo Development Corridor, from the beginning, South African Government played an active role by bearing the initial costs of infrastructure development. Furthermore, the preparation of bankable packages helped foreign, regional and domestic investors, as well as concerned government agencies to have a shared vision on future development and business opportunities.

The logistic and transport backbone of Maputo Development Corridor is composed of the following infrastructures and their operations:

- Ports of Maputo and Matola: Upgraded
- Port Services for Port Maputo Container Terminals and Matola Port Bulk Terminals: Private operators started to work.
- Rail Link between Maputo and Johannesburg (581 km): Upgraded and operated by a private concessioner. This became fully operational in

2003.

- Highway (N4) between Maputo and Johannesburg (590 km): PPP-BOT completed. This highway was opened in 2000.
- Coal-based Power Station and two Transmission Lines to Matola: completed.
- Pande-Secunda Gas Pipeline: PPP with Sasol completed.
- Border Post at Lebombo/ Resano Garcia: One stop border post was designed for implementation. However, this has not been realized yet.

Based on these infrastructure services, mineral resources-based industrial development has been implemented including:

- Aluminum smelter of Mozal in Mozambique
- Liquid fuels and petrochemicals by Sasol in South Africa

The ports of Maputo and Matola deal with the following exports and imports:

Major exports: Steel, aluminum, ferro-alloys, coal, forest products, granite, sugar, molasses, fruit

Major imports: Grain, rice, alumina, petcoke, fertilizers, petroleum, vehicles

Furthermore, the following potential developments are envisaged:

- Corridor Sands Project of Developing Mineral Sands of Ti & Fe and Ilmenite Smelter for Ti & Fe.
- Maputo Metallurgical Complex of Steel Plant, Fe Pelletizing Plant, Magnetite dump upgrading plan
- Fertilizer Plant (N/P)
- Chlor-alkali Plant (Na/Cl)

As seen above, the Maputo Development Corridor (MDC) has heavily specialized in mining and processing of metal resources. These metal-related investment opportunities can create demand large enough to make large-scale transport infrastructures feasible, such as railways, ports and highways.[1]

As a result of development of infrastructures serving the metal-related industry, investment projects in other sectors become viable. This is a clear SDI strategy using metal resources or mineral resources as catalyst for development of the Maputo Development Corridor.

In contrast to the successful progress and achievement of the Maputo Development Corridor, other corridors have not yet succeeded in implementing integrated programs by which to clarify visions and strategies of economic and social development by using transport infrastructure development as leverage and at the same time by utilizing undeveloped regional resources.

[1] However, in general, other sectors, such as agriculture and tourism sectors, could not create large demand for costly transport infrastructure.

2.4.6 North-South Corridor Initiative

In April 2009, COMESA, EAC and SADC announced a plan to implement an extensive aid for trade program covering transport, power and trade facilitation projects along the North-South Corridor through eight countries in East and Southern Africa.

The North-South Corridor is a combination of Durban Corridor and the Dar es Salaam Corridor linking inland countries to the Port of Durban and others in Southern Africa and also to the Port of Dar es Salaam.

The Durban corridor also has direct links to the Beira, Maputo, Walvis Bay, Benguela and Lobito corridors.

Development partners have pledged over US$ 1.2 billion for funding to meet the costs of a comprehensive aid for trade facilitation and upgrading road, rail, port and energy infrastructure.

This initiative for the north-south corridor might increase competition with east-west corridors including Nacala, Maputo, Walvis Bay and Lobito Corridors.

Source: North-South Pilot Aid for Trade Programme, Surface Transport, 2009

Figure 2.4.2 North-South Corridors in Southern Africa

2.5 Strategic Plan of Niassa Province 2017 (PEP, Niassa 2017)

2.5.1 Vision, Mission and General Objectives of PEP Niassa 2017

Niassa Province has established a Provincial Strategic Plan (PEP) for 10 years from 2008 to 2017. PEP Niassa 2017 emphasizes accelerated economic development and poverty reduction in its vision, mission and general objectives.

Table 2.5.1 Vision, Mission, General Objectives and Development Pillars in PEP Niassa 2017

Vision	- To have consolidated bases for fighting poverty and promoting accelerated and sustainable development.
Mission	- To accelerate social and economic development on a sustainable basis, integrating the province competitively within the national and regional economy.
General Objectives	- Accelerate and consolidate the economic, social and cultural development of the province - Reduce poverty by 15% by 2017
Development Pillars	Three Pillars of Development - Economic Development - Social Development - Institutional Development

Source: PEP Niassa 2017 (2008)

Three pillars of development strategies are designed to achieve the general objectives of consolidating and augmenting the current level of social, economic and cultural development in the province.

2.5.2 Development Frameworks of PEP Niassa 2017

PEP Niassa 2017 has established three alternative development scenarios and frameworks as shown in Tables 2.5.2 through 2.5.4. Either of these scenarios seems to be too ambitious in respect of GDP growth rates, while the GDP of Niassa Province is not yet so high in 2008, the starting year of the plan.

Table 2.5.2 Conservative Scenario of PEP Niassa 2017

Conservative Scenario	
GDP Growth	8 % per annum
Population	3 % per annum
GDP per capita	4.8% per annum
Agricultural Production	2.1% per annum
Other Indicators	Fiscal Receipts: 5% per annum (real) Reduction of the levels of resource transfers from the central government and international partners Lack of continuity in the current long-term investment projects (i.e., forestry) and no initiation of new projects with a large impact in the areas of forestry, commercial agriculture and mining. Attraction of few small and medium-scale investment projects, especially in tourism.

Source: PEP Niassa 2017, 2008

Table 2.5.3 Moderate Scenario of PEP Niassa 2017

Moderate Scenario	
GDP Growth	10 % per annum
Population	2.7 % per annum
GDP per capita	7.1% per annum
Agricultural Production	4.5% per annum
Other Indicators	Fiscal Receipts: 10% per annum (real) Continuation of the levels of resource transfer from the central government and international development partners Continuation of the current long-term investment projects (forestry) Attraction of new, small and medium-scale investment projects, especially for tourism, agriculture and livestock sectors

Source: PEP Niassa 2017, 2008

Table 2.5.4 Optimistic Scenario of PEP Niassa 2017

Optimistic Scenario	
GDP Growth	12 % per annum
Population	2.5 % per annum
GDP per capita	9.3% per annum
Agricultural Production	5 % per annum
Other Indicators	Fiscal Receipts: 14% per annum (real) Elevated levels of resource transfer from the central government and international development partners Continuation of the current long-term investment projects (e.g., forestry) and attraction of large new projects (mining, industrial tree plantations and commercial agriculture) and small and medium-scale investments in forestry Attraction of new high-value investment projects with large ability to generate jobs and income in tourism

Source: PEP Niassa 2017, 2008

2.5.3 Strategic Actions of PEP Niassa 2017

The document of PEP Niassa 2017 is a very informative and thought-provoking document containing a mixture of both ambitious and implementable actions.

PEP Niassa 2017 aims at high economic growth, social development and poverty reduction by implementing strategic actions as follows:

(1) Strategic Actions for Economic Development

- Development of infrastructure, including:
  1) Rehabilitation of Cuamba-Lichinga railway
  2) Paving of Lichinga-Mandimba-Cuamba Road and Marrupa-Ruace Road, and
  3) Extension of power network from Cahora Bassa to Marrupa, Cuamba-Marrupa and Lichinga-Sanga.
- Improvement and expansion of support services for investment and business, including:
  1) Creation of financial and credit institutions and agencies
  2) Creation of research and consultancy companies

3) Creation of organizations to facilitate registration and licensing of business activities

- Improvement of business environment by fiscal and other policies for economic development and entrepreneurial development
- Assuring of the attraction of private investment to forestry, agriculture, tourism and mining.
- Provision of incentives for industrial development, in particular for agro-processing and forestry
- Promotion of understanding of the province's economic reality and its strategy and investigation of the opportunities outside through the organization of economic fairs (inside and outside the province)
- Promotion of the emergence and consolidation of small and medium-scale national entrepreneurs (SMEs)

(2) Strategic Actions for Social Development

- Rehabilitation and amplification of health networks by strengthening a referral network within the development triangle Lichinga-Cuamba-Marrupa
- Upgrading all rural health posts into Type II health centers
- Reinforcement of referral capacity for sick people in the province
- Creation of conditions to attract health professionals to health units in peripheral areas
- Acceleration of formal and continuous training of professionals essential for health care
- Implementation of strategies to combat malaria, tuberculoses and HIV/AIDS
- Implementation of strategies to attend to women's and children' health
- Amplification of community school networks
- Increase of formal and continuous education and hiring of teachers with psycho-pedagogical training
- Provision material, equipment and communication technology with schools
- Revision and implementation of new management mechanisms for boarding schools
- Favoring of enrolment and maintenance of girls in schools
- Interaction with communities in activities to promote girls& participation in education
- Promotion and facilitation of creation of higher educational institutions in the province
- Provision of incentives for creation of satellites from institutions of higher education

- Increase of the number of basic and middle level teaching training schools in the province
- Setting up of centers for entrepreneurship in strategic districts
- Facilitation of creation of faculties that train technicians with specific skills that are a priority and possess profiles such that their integration into the job market will have a direct impact on the production of good and services and, consequently, on Niassa's development
- Restoration of water-supply systems in urban zones
- Widen the coverage of the water-supply network by rehabilitating wells and drilling new ones
- Popularization of collection of rainwater by use of tanks and cisterns
- Establishment and implementation of community plans for management and maintenance of water sources
- Provision of incentives for simple, basic practice for treating drinking water
- Promotion of use of low-cost technology and construction of housing and public buildings using locally available materials
- Preparation and implementation of plans for urbanization
- Implementation of sustainable activities for urban and rural sanitation

(3) Strategic Actions for Institutional Development

- Promotion of capacity building and education of human capital to be able to respond to sustainable development
- Supply of appropriate technological means to assure efficiency and efficacy of provision of services of interest to the public in general, and businesses in particular
- Acceleration and consolidation of reform process so as to make the public sector efficient and effective in providing services to citizens and create a favorable business environment in the province
- Institutionalization of mechanisms for dialogue between the private and public sectors and civil society
- Promotion of fiscal education campaigns at all levels and application of effective collection mechanisms to widen the tax base
- Professionalization of the One-Stop-Shop and consolidation of mechanisms to attract and promote investments through Business Center of Niassa (Nakosso)
- Institutionalization of coordination through the Cabinet for Development and Strategic Studies (GED)
- Institutionalization of excellent monitoring and evaluation mechanism

2.5.4 Implementation Mechanism of PEP Niassa 2017

Niassa Province prepares annual provincial Economic and Social Plans (PES) by following the directions determined by the 10-year strategic plan for Niassa Province (PEP Niassa 2017) and at the same time by reflecting the availability of annual budgets to the province. Based on this annual plan, they produced a review report for annual achievement.

The annual plans are organized in line with activities of each sector agency. In each sector, targets of achievement and activities are set in annual plans and their achievements are evaluated in comparison with the set targets in review reports.

In Niassa Province, coordination meetings have been regularly held among a variety of provincial directorates under the Provincial Governor, for implementing Annual PES and PEP 2017.

Provincial Secretariat Office and Provincial Directorate of Planning and Finance, as well as Office for Strategic Studies and Development (GED) have played key roles in promoting, implementing and monitoring those plans in an integrated and coordinated way.

2.5.5 Need for Provincial Development Program for Bridging Gaps between Strategic Plan for Niassa Province 2017 (PEP Niassa 2017) and Annual Provincial Economic & Social Plan (Annual Provincial PES)

PEP Niassa 2017 delineates many strategic actions for aiming at its vision and objectives. Some of those strategic actions are ambitious and costly, and it is not so easy to secure necessary finance for actual implementation of those actions.

On the other hand, annual provincial Economic and Social Plans (Annual Provincial PES) deal with routine actions and small-medium scale development projects, by utilizing secured provincial and sectoral budgets including resource transfer from the central government.

It is necessary for Niassa Province to bridge this clear gap between PEP Niassa 2017 and Annual Provincial PES by formulating a Mid-Term Provincial Development Program. This program consisting of selected proposals should be designed for the province and by the province for the purpose of proposing those projects to international development partners, as well as to the central government, in a proactive manner.

Chapter 3 Regional and Socio-economic Context of Niassa Province

3.1 Geography and Topography

(1) Location

Niassa Province is located in the north-west of Mozambique. It is located about 500 - 600 km inland from the sea.

Lake Niassa and Malawi lie to the west of Niassa Province, while Tanzania lies to the north. The Ruvuma River forms much of the northern boundary of the province with Tanzania.

Niassa Province borders with the provinces of Cabo Delgado to the east, Nampula to the south-east and Zambézia to the south.

Niassa Province spreads at latitude 11° 25' - 15° 26' south and at longitude 34° 30′ － 35° 58′ east.

(2) Size

Niassa Province has an area of 129,056 km^2. It is physically the largest province in Mozambique.

(3) Altitude

Niassa Province has four altitude zones. The first is the mountain zone (mostly between 1,000 and 1,500 m, and a maximum altitude of 1,800 m) spreading in the central western part of the province. Lichinga City, whose elevation is 1,360 m, is located in this altitude zone.

The second is the high plain zone (mostly between 500 and 1,000 m), which is found in the northern, central and southern parts of the province.

The third is the low plain zone (mostly between 200 and 500 m), which lies in the eastern part of the province.

The fourth is the surrounding zone (between 500 and 600 m) of the Niassa Lake. The surface elevation is about 500 m above the sea level.

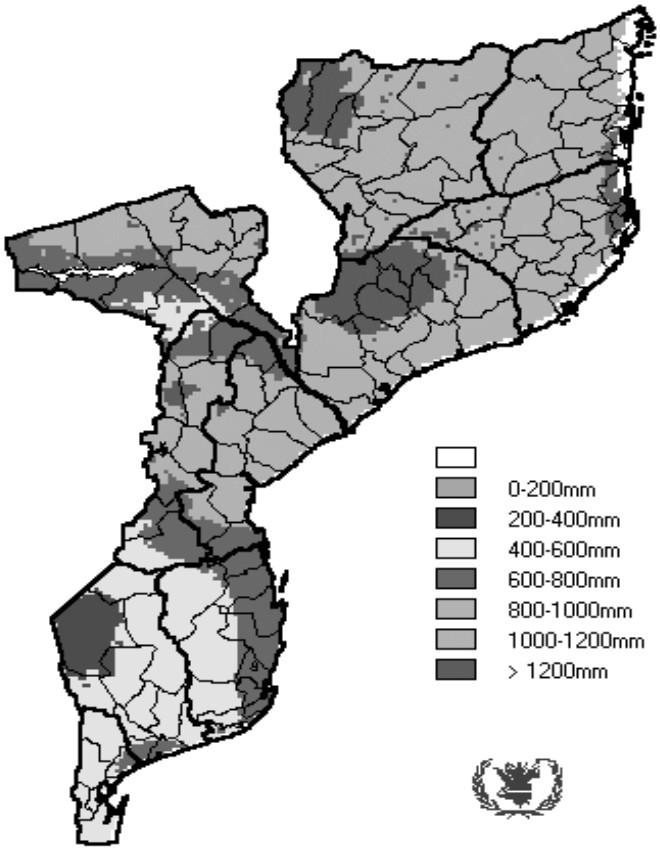
3.2 Climate

Niassa enjoys relatively high rainfall. Its mean annual rainfall is over 800 mm. Its highest rainfall takes place on the Lichinga Plateau, and the highest mountain areas have over 1,800 mm of rainfall per annum. The rainy season is from October to March.

Lichinga is cool on the high plateau. Lichinga's daily average temperature is 19 ℃. Daily maximum temperatures range from 22℃ in the coolest month (June) to 28℃ in the hottest month (October). Night temperatures range between

9℃ in the coolest month (June) and 15℃ in the hottest months.

Cuamba is hot in lowland. Its daily average temperature is 24℃. Daily maximum temperatures range from 28℃ in the coolest month (June) to 35℃ in the hottest months (October/November). Night temperatures range between 11℃ in the coolest month and 20℃ in the hottest months.



Source: UN-World Food Program, Mozambique

Figure 3.2.1 Seasonal Rainfall (November-April) in Mozambique

3.3 Population

3.3.1 Total Population and Provincial Populations of Mozambique

Mozambique reached 20 million populations in 2007. Its population growth rates have been affected by social movement of people. As shown in Table 3.1, during the civil war, Mozambique's population increased clearly at lower rates.

Many people who had escaped the civil war from their homeland to neighboring countries. Recently finding a peaceful situation and economic recovery, many people moved back to their homelands. This tendency was highly seen in the Northern Mozambique.

Table 3.3.1 Population Changes of Mozambique, 1950-2007

Year	Total Population (1,000)	Annual Growth Rate (%)
1950	6,466	
		1.6%
1960	7,595	
		2.2%
1970	9,408	
		2.6%
1980	12,130	
		1.7%
1997	16,099	
		2.5%
2007	20,531	

Source: INE Website 2009

In the last 10 years (between 1997 and 2007), Niassa Province is one of the provinces which experienced the highest growth rates of population in Mozambique. The population of Niassa Province increased by 46% compared to that of 1997. This increase is equivalent to the annual growth rate of 3.8%.

This increase rate of Niassa Province was the third highest among the provinces. The highest rate of population increase took place in Maputo Province. The second highest increase rate was found in Tete Province.

Table 3.3.2 Changes in Provincial Populations between 1997 and 2007

Province	Population		Growth Rate (%)	Annual Growth Rate (%)
	1997	2007	1997-2007	1997-2007
Total	16,075,708	20,530,714	27.7	2.5%
Niassa	808,572	1,178,117	45.7	3.8%
Cabo Delgado	1,380,202	1,632,809	18.3	1.7%
Nampula	3,063,456	4,076,642	33.1	2.9%
Zambézia	3,096,400	3,892,854	25.7	2.3%
Tete	1,226,008	1,832,339	49.5	4.1%
Manica	1,039,463	1,418,927	36.5	3.2%
Sofala	1,368,671	1,654,163	20.9	1.9%
Inhambane	1,157,182	1,267,035	9.5	0.9%
Gaza	1,116,903	1,219,013	9.1	0.9%
Maputo Province	830,908	1,259,713	51.6	4.2%
Maputo City	987,943	1,099,102	11.3	1.1%

Source: INE Website on Population Census 2007

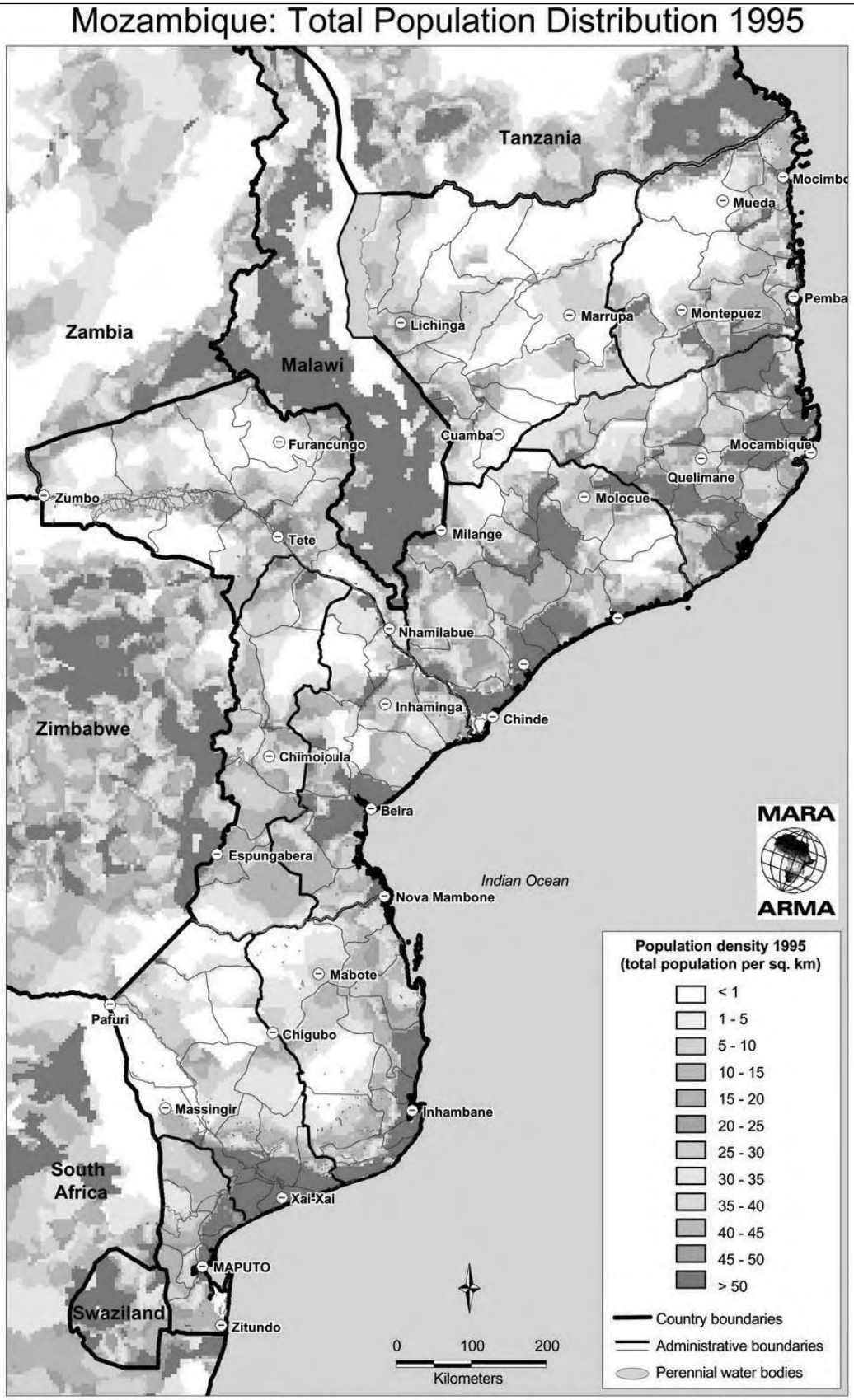
3.3.2 Population Distribution and Population Density

The combined population of Maputo City and Maputo Province is about 2.3 million. This population accounts for 11.5% of the total population of Mozambique. This relatively low rate of population concentration to Maputo City and Maputo Province reveals that Mozambique has other populous provinces and cities over the country. In fact, Nampula Province and Zambezia Province have 20 % (4.1 million people) and 19% (3.9 million people) of the total population respectively.

The population of Niassa Province was only 1.19 million in 2007. Except for Maputo City (1.1 million), Niassa's provincial population was the smallest in the provinces. The area of Niassa Province is 129,000 km^2 and the largest province in terms of its physical size. Consequently, the population density of Niassa Province is 9.1 persons/km^2 and it is the lowest among the provinces.

In comparison with neighboring countries, the population density of Niassa, as well as that of other inland provinces of Mozambique, is very low. Please see Figure 3.3.1.[1]

[1] This figure shows 10-year old data of population density. However, the geographical pattern of population density has not changed so much.



This map is a product of the MARA/ARMA collaboration (http://www.mara.org.za). July 2001, Medical Research Council, PO Box 17120, Congella, 4013, Durban, South Africa
CORE FUNDERS of MARA/ARMA: International Development Research Centre, Canada (IDRC); The Wellcome Trust UK; South African Medical Research Council (MRC); Swiss Tropical Institute, Multilateral Initiative on Malaria (MIM) / Special Programme for Research & Training in Tropical Diseases (TDR), Roll Back Malaria (RBM).
Africa Population Database: Deichmann, U. 1996. World Resources Institute (WRI), http:// www.grid2.cr.usgs.
Topographical data: African Data Sampler, WRI, http://www.igc.org/wri/sdis/maps/ads/ads_idx.htm.

Figure 3.3.1 Population Densities in Mozambique and Neighboring Countries

Table 3.3.3 Population Distribution and Population Density by Province, 2007

Province	Area (km2)	% of Area	Population	% of Population	Population Density (persons/ km^2)
Total	799,380	100.0%	20,530,714	100.0%	25.7
Niassa	129,056	16.1%	1,178,117	5.7%	9.1
Cabo Delgado	82,625	10.3%	1,632,809	8.0%	19.8
Nampula	81,606	10.2%	4,076,642	19.9%	50.0
Zambézia	105,008	13.1%	3,892,854	19.0%	37.1
Tete	100,724	12.6%	1,832,339	8.9%	18.2
Manica	61,661	7.7%	1,418,927	6.9%	23.0
Sofala	68,018	8.5%	1,654,163	8.1%	24.3
Inhambane	68,615	8.6%	1,267,035	6.2%	18.5
Gaza	75,709	9.5%	1,219,013	5.9%	16.1
Maputo	26,058	3.3%	1,259,713	6.1%	48.3
Maputo Cidade	300	0.04%	1,099,102	5.4%	3,663.7

Source: INE Website on Population Census 2007

3.3.3 Urban Population and Major Cities in Mozambique

The rate of urban population out of the total population is about 33%, which is not so high.[1]

Maputo Metropolitan Area consisting of Maputo City and Matola is the largest metropolitan in Mozambique. It has 1.8 million population.

The second and the third largest urban areas are Nampula and Beira. Their populations are around 500,000.

Lichinga is the capital city of Niassa Province. Its population is about 140,000, and it is the ninth largest town in Mozambique.

Table 3.3.4 shows populations of major cities and towns in Mozambique. Those in Northern Mozambique include Nampula, Nacala, Quelimane, Gurue, Lichinga and Pemba.

[1] The urban population rate of 33% was taken from the website of UN-HABITAT Mozambique. The data on urban population of 2007 Population Census has not yet officially been available.

Table 3.3.4 Population of Major Cities in Mozambique, 2007

City or Metropolitan	Province	Population
Maputo and Matola	Maputo City & Maputo Province	1,774,524
Nampula	Nampula	477,900
Beira	Sofala	436,240
Chimoio	Manica	238,976
Nacala	Nampula	207,894
Quelimane	Zambezia	192,876
Mocuba	Zambezia	170,000
Tete	Tete	152,909
Gurué	Zambezia	145,000
Lichinga	Niassa	142,253
Pemba	Cabo Delgado	141,316

Source: INE Website on Population Census 2007

3.3.4 Population Distribution and District Population in Niassa Province

Cuamba-Mandimba-Lichinga Road runs through four districts (Cuamba, Mandimba, Ngauma and Lichinga) and two municipalities (Cuamba and Lichinga). Those districts have higher population density, as well as larger agricultural production.

About 53% of the 1.1 million population of Niassa Province concentrate in these four districts and two municipalities. When surrounding districts under possible influence of Cuamba-Mandimba-Lichinga Road are added to the four districts and two municipalities, their populations amount to 80% of the total population of Niassa Province.

Table 3.3.5 District Populations in Niassa Province, 1997 and 2007

District	1997	2007	1997-2007 Annual Growth Rate (%)	Area (km2)	Population Density (Persons/km2)
	1)	2)		3)	
Total	808,573	1,178,117	3.84%	118,176	10.0
Lichinga	67,198	95,172	3.54%	4,075	23.4
Cuamba	134,998	187,458	3.34%	5,121	36.6
Lago	59,746	75,504	2.37%	6,528	11.6
Majune	22,030	29,722	3.04%	9,059	3.3
Mandimba	89,854	136,238	4.25%	4,385	31.1
Marrupa	42,998	58,683	3.16%	17,730	3.3
Maúa	41,148	49,486	1.86%	9,957	5.0
Mavago	13,272	20,308	4.35%	9,559	2.1
Mecanhelas	81,699	157,976	6.82%	6,406	24.7
Mecula	11,727	14,524	2.16%	18,153	0.8
Metarica	21,823	29,460	3.05%	3,489	8.4
Muembe	19,972	29,083	3.83%	5,526	5.3
N'gauma	36,009	65,436	6.16%	2,421	27.0
Nipepe	27,368	30,532	1.10%	3,292	9.3
Sanga	47,221	56,282	1.77%	12,185	4.6
Cidade de Lichinga	91,510	142,253	4.51%	290	490.5

Source

1): Insitute National de Estatistica (INE), 1999, Actualizacao das Projeccoes da Populacao Por Distritos 1997-2015 Regiao Norte

2) INE Website 2009, Population Census 2007

3): INE, 2004, Anuario Estatistico Provincia de Niassa 2003

3.3.5 Urban Centers and Urban Population in Niassa Province

Lichinga City is a government administrative center of Niassa Province and a commercial center in the north-western part of Niassa. On the other hand, Cuamba Town is a commercial center in the southern part of the province.

In 2007, Lichinga Municipality has 142,253 populations. Cuamba Municipality has 79,779 population. In 1997, Lichinga Municipality had 89,043 population and Cuamba Municipality had 59,396 population. In 1980, the population of Lichinga Municipality was 41,000.

In the last ten years, a larger increase of urban population took place in Lichinga Town than other towns in Niassa Province. The periphery of the town of Lichinga has absorbed that increased population, who are mostly farmers.

Mandimba Town is also an active commercial center located at the border with Malawi. It lies in the middle of Lichinga City and Cuamba Town.

Figure 3.3.2 Populations of Urban Centers in Niassa Province

3.3.6 Village Population and Village Settlements

The populations of Niassa Province are mostly populations residing in villages. The amount of village populations is estimated to be about 900,000 by excluding the amount of urban populations in Lichinga City, Cuamba Town and other district capitals.

On the other hand, the number of villages (*povoacoes*) in Niassa Province is 775.[1] Therefore, it is estimated that the average village population is around 1,100 people and the average number of households in a village is about 230 households.

Village settlements are located mainly along roads (primary, secondary and tertiary roads). See an example of Mandimba District shown in Figure 3.3.3. In rural areas, people live along the roads and cultivate fields not only along roads but also away from roads.

People used to live in a scattered manner in Niassa Province. During the civil

[1] This number of villages is obtained from the GIS database of villages and their populations.

war, people lived in a concentrated manner in towns for security reasons. After the war, people started to live in a scattered manner again but along roads. Now many people live along roads and cultivate fields as far as 10 km away from roads. People enjoy living along roads, where public facilities, such as schools and health centers, as well as grinding mills, are available.

Source: WaterAid Project in Niassa Province, 2006

Figure 3.3.3 Geographical Distribution of Village Settlements in Mandimba District

3.4 Economic Situation of Niassa Province

3.4.1 Economic Structure of Niassa Province

The economic structure of Niassa Province is heavily dominated by the primary sector of agriculture, livestock and forestry. See Table 3.4.1. Moreover, the majority of the economic actors are smallholders.

Table 3.4.1 GRDP by Sector, 2006

Sector	GRDP in 2006 (At 2005 Constant Price)	%
Agriculture, Livestock and Forestry	4,492,646	87.4%
Fishery	5,861	0.1%
Mining	335,000	6.5%
Energy and Fuels	279,317	5.4%
Construction Materials	1,339	0.03%
Construction	609	0.01%
Transportation and Communications	25,208	0.5%
Total	5,139,981	100%

Source: PEP Niassa 2017

3.4.2 GRDP per Capita of Niassa Province

The Gross Regional Domestic Product (GRDP) per capita of Niassa Province was US$132 in 2002, US$151 in 2003 and US$171 in 2004. There is a large disparity between northern and southern provinces in respect of GRDP per capita. See Table 3.4.1.

Table 3.4.2 GRDP per Capita (US$) of Niassa Province, Nampula Province and Southern Provinces

	2002	2003	2004
Niassa Province	132	151	171
Nampula Province	154	181	202
Provinces in Southern Region	441	490	603

Source: Provincial Statistical Reports, INE

3.5 Poverty

The poverty situation of Mozambique largely improved from 1996 to 2003. However, in 2003, over 50% of the populations are in poverty.

It is indeed that from 1996 to 2002 the poverty rate decreased substantially in Mozambique as a whole, as well as in Niassa Province. However, still a high percentage, 52% of the people was estimated in poverty in 2003 in Niassa Province.

Poverty and agriculture are very closely related in rural areas, such as Niassa Province. The following propositions were prepared for Mozambique as a whole[1], but it is possible to apply them to Niassa Province.

- Agriculture has reduced poverty particularly due to expansion of cultivated land.
- Agriculture in Mozambique grew rapidly, although it was affected by climate.
- Production of basic food crops is a key driving factor for high growth in agricultural production in Mozambique, while cash crop production for export is also expanding.
- Crop production was increasingly more diversified in 2002 than in 1996, resulting in increase in crop income and in reduction of household vulnerability.
- Increased extension of cultivation was the main source of agricultural growth.
- Still the cultivated areas by smallholders (small farmers) are still too small compared to adequate sizes.
- Although still weak, market participation has improved, and crop commercialization has increased.
- Participation in agricultural markets (commercialization) is important for improving the welfare of rural households.
- Degrees of market participation are different for different crops.
- Market participation and household success in crop markets are closely related to education level of farmers.

[1] World Bank (2008), Mozambique: Beating the Odds: Sustaining Inclusion in a Growing Economy, Volume 1: Main Report.

Table 3.5.1 Trend in Incidence of Poverty

	Poverty Headcount Index (%)	
	1996-97	2002-03
Nationwide	69.4	54.1
Urban	62.0	51.5
Rural	71.3	55.3
Niassa	70.6	52.1
Cabo Delgado	57.4	63.2
Nampula	68.9	52.6
Zambezia	68.1	44.6
Tete	82.3	59.8
Manica	62.6	43.6
Sofala	87.9	36.1
Inhambane	82.6	80.7
Gaza	64.6	60.1
Maputo Province	65.6	69.3
Maputo City	47.8	53.6

Source: PARPAII

3.6 Prices of Daily Goods

High transport costs to inland areas, such as Lichinga and Cuamba, reflected in prices of daily goods. See Table 3.6.1.

On the other hand, cement prices in Lichinga tend to increase in the rainy season.

It is said that quite a few people want to invest in Lichinga, but bad roads (Lichinga-Mandimba Road and Cuamba-Mandimba Road) increase costs of business operation, resulting in less competitiveness than other provinces.

Table 3.6.1 Comparison of Prices of Daily Goods, as of April 2009

	Lichinga		Cuamba		Nampula	
Soap	18	Mt/bar	20	Mt/bar	10	Mt/bar
Sugar	22	Mt/kg	20	Mt/kg	20	Mt/kg
Salt	12.5	Mt/500g	5	Mt/500g	3	Mt/500g
Cooking Oil	25	Mt/300ml	20	Mt/300ml	15	Mt/300ml
Rice	40	Mt/kg	30	Mt/kg	25	Mt/kg
Maize Flour	10	Mt/cup	5	Mt/cup	5	Mt/cup
Coke	20	Mt/bottle	10	Mt/bottle	10	Mt/bottle
Cement	340	Mt/50kg	250	Mt/50kg	225	Mt/50kg

Source: JICA Study Team

Chapter 4 Economic Sectors in Niassa Province: Present Situation and Existing Policies/Plans

4.1 Agriculture

4.1.1 Agro-ecological Zones

Mozambique is divided into the following ten (10) agro-ecological zones:

- R1: The Interior of Maputo and South Gaza
- R2: The Coastal Region South of the River Save
- R3: Central and Northern Gaza and the West Inhambane
- R4: Medium Altitude Region of Central Mozambique
- R5: Low Altitude Region of Sofala and Zambezia
- R6: Semi-Arid Region of the Zambezi Valley and South of Tete Province
- R7: Medium Altitude Region of Zambezia, Nampula, Tete, Niassa and Cabo Delgado
- R8: Coast of Zambezia, Nampula and Cabo Delgado
- R9: Interior North Region of Cabo Delgado-Plateau Mueda
- R10: High Altitude Region of Zambezia, Niassa, Manica and Angónia

Two zones, namely R7 and R10, are found in Niassa Province. Although the area of R7 is very large in Mozambique, the area of R10 is very limited and small. It is advantageous for Niassa Province to have the area of R10.

R7: Medium Altitude Region of Zambezia, Nampula, Tete, Niassa and Cabo Delgado

R7's elevation is between 200 and 1,000 meters above the sea level (sub-plateau, low plateau and mid plateau) within the Zambezia, Nampula and South of Cabo Delgado and Niassa.

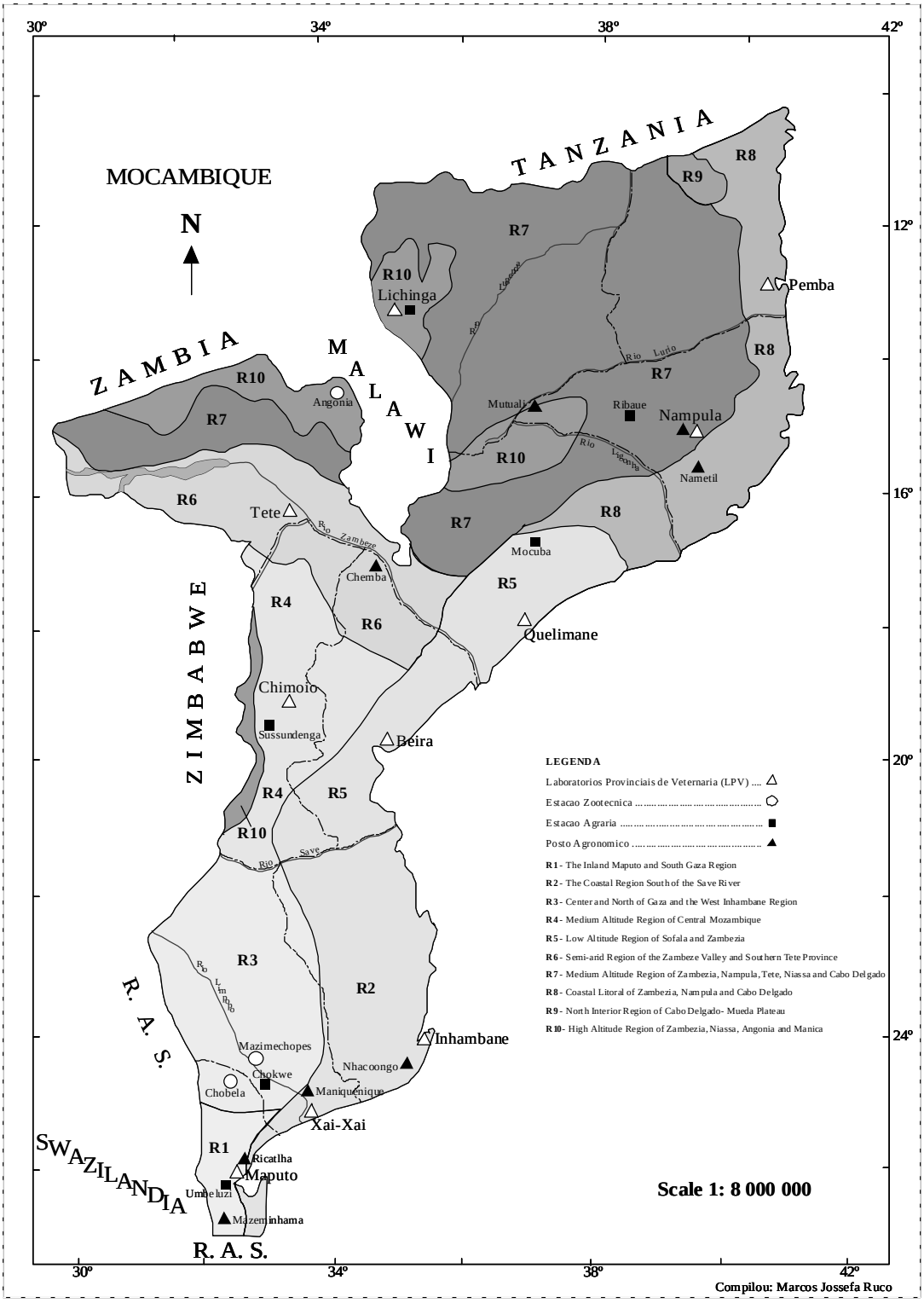
Annual precipitation of the region varies between 1,000 and 1,400. There are two zones of temperatures. One is the area of more than 25 degrees of centigrade (classified as hotspots) during crop development. The other is with temperatures between 20 and 25 degrees (moderately hot).

Basically there are two types of cropping systems. One depends more on maize, and the other is based on sorghum. Cassava is also widely cultivated. Peas and peanuts are also important crops. In the easternmost part of the region, cashew is very important. Practically in the whole region, there is great potential for growing cotton.

R10: High Altitude Region of Zambezia, Niassa, Manica and Angónia

R10 is a high altitude region of Zambezia, Niassa, Angónia-Marávia which includes lands above 1,000 meters, notably in the plateau regions of Lichinga, Angónia, Marávia, high Zambezia, Serra Choa, Manica and Espungabera. The rainfall is above 1,200 mm and the average temperature varies between 15 and 23 degrees. Soils are mainly ferrassolos. Beans and potatoes are important crops. Due to the high level of precipitation, erosion and loss of soil fertility are major problems. Millet is also grown in the region, and is an important food and cash

crop.



Source:Documento Estratégico O ProAgri II, 2004

Figure 4.1.1 Agro-ecological Zones in Mozambique

4.1.2 Food Crop Production

The soils, climate and altitudes in Niassa Province are generally suitable for cultivating a variety of food crops, including maize, sorghum, mexoeira, beans, potato, sweat potato, rice, sunflower, pumpkin and other leaf vegetables.

In the last several years, Niassa Province has experienced substantial increase of agricultural production, while the production of food crops has been stable in Mozambique. See Tables 4.1.1 and 4.1.2.

In Niassa Province, noticeable production increase of maize, groundnuts and cassava was seen in the last several years.

As shown in Table 4.1.3, Niassa Province contributes to food crop production largely in respect of maize, mexoeira and beans. While Niassa Province occupies 16% of the land of Mozambique, it has only 6% of the population of Mozambique. Niassa produces more or less 16% of maize and beans.

Table 4.1.1 Food Crop Production in Mozambique

Crops	Unit	2002	2003	2004 a)	2005	2006 b)
Maize	Ton	1,114,772	1,178,792	1,060,396	942,000	1,395,474
Sorghum	Ton	138,318	190,820	152,910	115,000	201,758
Mexoeira	Ton	12,184	21,609	18,305	15,000	22,363
Paddy	Ton	93,362	117,483	91,242	65,000	97,611
Nhemba Beams	Ton	53,724	53,724	50,862	48,000	71,170
Jugo Beans	Ton	22,000	18,000	12,500	7,000	11,608
Manteiga Beans	Ton	35,683	40,854	44,927	49,000	49,627
Sweat Potato	Ton	455,950	877,165	...	...	915,252
Groundnuts	Ton	101,074	87,463	90,232	93,000	84,623
Cassava	Ton	3,555,278	6,547,298	...	...	6,658,708

Source: Ministério da Agricultura/ Direcção Nacional de Economia - Inquéritos Agricolas (TIAs)

a) Estimated data, b) Preliminary data

Table 4.1.2 Food Crop Production in Niassa

Crops	Unit	2004	2005	2006	2007
Maize	Ton	119,361	230,872	300,096	302,665
Sorghum	Ton	27,132	35,948	30,877	36,802
Mexoeira	Ton	845	N.A.	885	853
Paddy	Ton	N.A.	N.A.	17,921	14,257
Beans	Ton	29,041	33,769	46,753	48,189
Groundnuts	Ton	2,446	2,488	2,930	5,271
Cassava	Ton	155,360	211,099	216,859	242,490

Source: Provincial Directorate of Agriculture (2008), Balanco da Campanha Agricola 2007/08 and Perspectivas para Camphanya Agricola 2008/09

Table 4.1.3 Contribution of Niassa Province to Food Crop Production in Mozambique, 2005

Crops	Mozambique		Niassa Province		Niassa Province	
	Cultivated Area (ha) (1)	Production (ton) (1)	Cultivated Area (ha) (2)	Percent of Cultivated Area in Mozambique	Production (ton) (2)	Percent of Production in Mozambique
Maize	1,440,000	1,382,000	132,800	9.2%	230,872	16.7%
Sorghum	530,000	308,000	40,270	7.6%	35,948	11.7%
Maxoeira	95,000	36,000	1,478	1.6%	7,922	22.0%
Paddy	191,000	174,000	5,190	2.7%	1,092	0.6%
Beans	451,000	201,000	61,122	13.6%	33,769	16.8%
Peeled Peanuts	310,000	132,000	5,159	1.7%	2,488	1.9%
Cassava	1,106,000	6,635,000	25,859	2.3%	211,099	3.2%

Source: (1): Statistics of Ministry of Agriculture, Mozambique
Source: (2): Provincial Directorate of Agriculture, Niassa Province

4.1.3 Cash Crop Cultivation

Major cash crops in Niassa Province are tobacco and cotton. In recent years, cotton cultivation decreased and tobacco cultivation increased largely, as shown in Table 4.1.5.

In addition to those cash crops, smallholder farmers tend to sell part of food crops, such as maize, beans, cassava and vegetable in order to satisfy their cash needs. In recent years, farmers grow more beans for selling.

Active cultivation of major cash crops, such as tobacco and cotton, takes place in limited areas of the province. See Table 4.1.7.

Table 4.1.4 Cash Crop Production in Mozambique

Cash Crops	Unit	2002	2003	2004	2005	2006
Cotton	ton	N.A.	75,000	89,000	102,000	122,000
Cotton Seeds	ton	82,980	54,144	92,000	78,500	114,829
Cashew Nuts	ton	50,177	63,818	42,988	104,337	62,821
Sugarcane	ton	1,586,260	1,940,799	1,873,262	2,246,985	2,060,317
Green Tea Leaf	ton	12,579	12,690	15,127	16,000	16,000
Citrus	ton	24,025	30,000	30,000	30,000	32,000
Copra	ton	45,740	47,600	47,000	74,000	47,000
Tobacco	ton	25,611	37,051	49,528	65,042	59,071
Sunflower	ton	4,149	6,400	6,127	7,000	7,000

Source: Ministry of Agriculture, Economic Directorate

Table 4.1.5 Tobacco and Cotton Production in Niassa Province

	2005/2006	2006/2007	2007/2008
Cotton (ton)	9,040	7,550	3,640
Tobacco (ton)	1,0946	9,527	12,800

Source: Provincial Directorate of Agriculture (2008), Balanco da Campanha Agricola 2007/08 and Perspectivas para Camphanya Agricola 2008/09

Table 4.1.6 Contribution of Niassa Province to Tobacco and Cotton Production in Mozambique

	2005/2006	2006/2007
Cotton	8.9%	6.2%
Tobacco	16.8%	16.1%

Source: Calculated from Tables 4.1.4 and 4.1.5.

Table 4.1.7 Cultivation Areas of Cash Crops and Food Crops in Districts, Niassa Province, 2007

Cash Crops and Food Crops	Major Producing Districts and Areas of Cultivation (ha)
Beans	Cuamba (15,008), Lichinga City (11,215), Mechanhelas (6,040), Mandimba (6,034)
Cotton	Cuamba (6,100), Nipepe (1,032), Metarica (1,000)
Tobacco	Mandimba (3,807), Mecanhelas (2,888), Cuamba (2,649), Marrupa (1,516) ,
Rice	Lago (2,772), Cuamba (2,380), Mecanhelas (1,125)
Potato	Lichinga City (1,300), Lichinga (653), Lago (400)

Source: Provincial Directorate of Agriculture, Niassa Province, 2007

4.1.4 Agricultural Productivity and Green Revolution Policy

The productivity of crops grown by smallholders in Niassa Province is not so high compared to the potential yield (ton per ha) in the case of using improved seeds and chemical input.

Table 4.1.8 Actual and Potential Productivity by Crop

Crops	Actual Yield (ton per ha) in Niassa Province1	Potential Yield (ton per ha) based on Improved Seeds and Chemical Input2
Maize	1.3 - 1.8 ton per ha	5 - 6.5 ton per ha
Rice	0.9 - 2.4 ton per ha	2.5 - 6.0 ton per ha
Beans	0.5 – 0.7 ton per ha	0.5 – 2.5 ton per ha
Cassava	6.3 – 8.0 ton per ha	5.0 – 10.0 ton per ha
Sorghum (Mapira)	0.7 – 1.0 ton per ha	0.8 – 2.0 ton per ha
Cotton	0.4 - 0.5 ton per ha	1.2 ton per ha

Source:
1): Provincial Directorate of Agriculture, Niassa Province, 2009
2): Peter E. Coughlin (2006), Agricultural Intensification in Mozambique: Infrastructure, Policy and Institutional Framework, EconPolicy Research Group Lda.

The Government of Mozambique has promoted a Green Revolution Program since 2007. In Niassa Province, a field test and demonstration has been just finished in model farms. The provincial directorate of Niassa has a plan to conduct a dissemination project by providing a few farmers with packages of improved seeds and chemical input.

4.1.5 Smallholders' Situation

(1) Agricultural Holdings

Agriculture sector of Mozambique is dominated by smallholders. In 2000, the average size of cultivated area per household was about 1.26 ha. In 2003, it was about 1.41 ha.

In Niassa Province, there are almost no large holders of agriculture. Most farmers' cultivated lands are between 0.9 and 1.9 ha in Niassa Province. [3]

(2) Cultivated Land

In Niassa Province, the area under cultivation accounts for only 1.9 % of the provincial total area. This rate is the smallest among the provinces.

[1] Provincial Directorate of Agriculture of Niassa (2008)
[2] Peter E. Coughim, EconPolicy Research Group, Lda. (2006), Final Report "Agricultural Intensification in Mozambique" , financed by SIDA.
[3] Provincial Directorate of Agriculture, Niassa Province, 2009

Table 4.1.9 Population Density and Cultivated Area by Province, 2000-2001

Province	Population Density (Persons/km2)	Cultivated Area (%)
Total		4.9
Niassa	6.2	1.9
Cabo Delgado	16.4	4.8
Nampula	37.8	9.4
Zambézia	28.1	5.3
Tete	11.3	3.9
Manica	15.6	4.9
Sofala	19.1	4.1
Inhambane	16.4	6.0
Gaza	14.0	6.1
Maputo Província	35.6	5.1
Maputo City		N.A

Source: Agricultural Census (CAP), 1999-2000

4.1.6 Commercialization of Smallholder Agriculture

(1) Smallholder Agriculture

Most smallholders grow food crops for subsistence. They sell part of food crops to satisfy their cash needs. Some smallholders cultivate cash crops such as tobacco and cotton by getting supply of seeds and chemical inputs. In recent years, those cash crop productions, especially tobacco production, increased largely. However, still there are not so many farmers who grow cash crops.

This situation of low-medium commercialization of smallholders is still prevalent among those smallholders who live along major roads in northern and central Niassa Province, although they can enjoy relatively good access to middlemen and nearby market towns along major roads, such as Lichinga-Mandimba Road.

On the other hand, in the southern part of Niassa Province, smallholding farmers are active in cash crop production partly because of the assistance of Oxfam and CLUSA.

(2) Oxfam and CLUSA

In the last 10 years, Oxfam and CLUSA have supported smallholders to organize agricultural associations for improving access to seeds, knowledge, finance and markets in six districts (Cuamba, Maua , Metarica, Mecanhelas, Mandimba and Nipepe) in the southern part of Niassa Province. CLUSA has worked with the Union of Associations in southern districts of Niassa (UCASNU) for smallholder commercialization. As a result, agricultural associations under UCASNU are active in producing cash crops, including sesami for export.

Table 4.1.10 Agricultural Associations and Zonal Unions in Southern Niassa

District	Number of Unions (Zonal Unions)	Number of Associations	Number of Total Members	Number of Female Members
Cuamba	9	97	4,096	1,939
Maua	7	51	1,968	955
Metarica	9	55	1,957	974
Mecanhelas	9	64	2,094	1,186
Mandimba	9	85	1,993	1,059
Total	40	354	12,208	6,113

Source: CLUSA Cuamba, 2009

IFAD has also assisted agriculture and smallholders in Niassa Province since the end of the civil war, by conducting the following projects:

- Niassa Agricultural Development Project (NADP) in Sanga and Lichinga Districts: 1994-2002
- Programa de Apoio Aos Mercados Agricolas (PAMA) in Cuamba, Maua and Marrupa Districts: 2001-2008
- Programa de Promoção dos Mercados Rurais (PROMER): From 2009-.

(3) PAMA, 2001-2008

The components of PAMA were as follows:

- Support to market intermediaries by input supply and output buying
- Group development (build associations and facilitate farmers to linking to markets) by establishing market information system covering various crops through radio
- Rural infrastructure (build roads, unclassified roads)

PAMA's rural road building was conducted for improving access to railway stations (CFM-North between Cuamba and Nampula) from rural hinterlands, so that farmers can get higher negotiation power to get competitive prices for their produce.

(4) PROMER, from 2009

PROMER will be operated in 15 districts in four provinces (Nampula, Cabo Delgado, Niassa and Zambesia).

PROMER will continue to implement similar components to PAMA's. However, PROMER will emphasize the following points which are different from PAMA:

- Rural finance in rural areas
- Technology access (access to technical information) through technical extension
- Market linkage

- Natural resources (fishery resources, etc.)
- Partnership between communities and investors (To assist communities to link with investors)

In contrast to the past project of PAMA and those by Oxfam/CLUSA, PROMER will work on technology access for smallholders.

4.1.7 Action Plan for Food Production

In June 2008, an action plan for food production 2008-2011 was agreed in the counsel of ministers, covering the following food items:

- Maize
- Rice
- Wheat
- Cassava
- Potato
- Sunflower
- Soybean
- Chicken
- Fish

For each food production, the action plan formulated intervention strategies and identified priority districts.

Table 4.1.11 Priority Districts selected in Niassa Province for Action Plan for Food Production

	Priority Districts in Niassa Province
Maize	Lichinga, Ngauma, Mandimba, Cuamba, Mecanhelas, Maua, Nipepe, Marrupa
Rice	Mandimba, Mecanhelas
Wheat	Lichinga, Lago, Sanga, Muembe
Cassava	No district
Potato	Lichinga, Lago, Sanga, Muembe
Sunflower	No district was selected
Soybean	No district was selected
Fish	Lichinga, Lago, Sanga, Ngauma, Mandimba

Source: Agraria Document and Information Center, Plano de Accao para a Producao de Alimentos 2008-2011, June 2008

4.2 Forestry

4.2.1 Vegetation in Niassa Province

Niassa Province is endowed with one of the richest forest resources in Mozambique. Most of the province is covered by deciduous broadleaf forest (Miombo woodland) while the areas along rivers are of Savanna. The plateau region has higher density of Miombo vegetation.

Tree species of higher economic values like Umbila (Ptercarpus angolensis), Mbaua (Khaya niassica), Jambire (Milletia stuhmnnii), Sandalo africano (Spirostarchys Africana sonder) and Mentonha (Sterculia Quinquiloba) are found in Districts of Cuamba, Mandimba, Metarica, Nipepe and Marrupa.[1]

However, the woodlands near Lichinga, Mandimba and Cuamba Towns have been heavily degraded largely due to wood cutting for fuel wood. Everyday a lot of fuel wood is transported by villagers on foot or by bicycle and sold to nearby towns. At present, the degraded lands were found as far as 30 km from towns along roads.

These vast tracts of degraded lands are suitable for industrial tree plantation. The Ministry of Agriculture has identified about 2.4 million ha of land suitable for industrial tree plantation in Niassa Province.[2]

4.2.2 National Reforestation Policy

In 2006, the Mozambique Ministry of Agriculture issued the document "National Reforestation Strategy (Estratégia National de Reflorestamento" for discussion. The strategy aims at promoting the establishment of industrial tree plantations using fast-growing species, not only for economic development, but also for job creation and poverty eradication in rural areas.

7 million hectares have been identified as potential areas suitable for forestation in the provinces of Sofala, Manica, Zambezia, Nampula and Niassa. It proposes to establish at least 2 million hectares of tree plantations in the next 20 years.

The strategy document is aware of high potential for export to emerging markets of raw materials to produce pulp and paper, in China, India and other Asian countries.

4.2.3 Investment in Tree Plantations in Niassa Province

Lichinga has over 1,500 hectares of pine tree plantations. This reveals development potential of tree plantations.

Since 2005, foreign private investors have decided to establish industrial tree plantations in Niassa Province. At present, four to five forest companies have business plans to plant nearly 300,000 hectares[3] of pine, eucalyptus and other species in the Districts of Muembe, Lichinga, Ngauma, Sanga and Lago. These

[1] Provincial Directorate of Environment Coordination of Niassa (1999), Perifil Ambiental do Niassa
[2] Ministry of Agriculture, PROAGRI, Zoning and Identification of Areas for Investment in the Agriculture Sector and Socio-Environmental Analysis for Niassa Province.
[3] This area of tree plantations includes those not only for industrial tree production but also for forest conservation.

plantations are aimed at growing trees for producing sawn timber and pulp tips. They grow seedlings in Niassa by importing fertilizer. It takes about se years for trees to be harvested.

This large scale of tree plantations enables local tree processing industries, such as those for sawn timber, furniture, flooring material and pulp, to operate in a sustainable manner.

Originally these forest companies had plans to depend on the existing railway from Lichinga, Cuamba, Nampula and farther to Nacala in order to transport their produce for reaching domestic and international markets.

4.2.4 On-going Tree Plantations in Zambezia Province

In parallel with industrial tree plantation development in Niassa Province, Zambezia Province also has attracted substantial investment to industrial tree plantations of pine and eucalyptus in its northern part (Gurue District, Namaroi District, Lugela District, Alto Molocue District and Ile District).

These districts are closer to the CFM-North Line between Cuamba and Nacala through Nampula. Tree planting companies operating in Zambezia Province consider the possibility to transport their produce using the railway line, as well as National Highway No. 13.

4.2.5 SIDA and Malonda Foundation

SIDA has supported Niassa Province since 1998. In the course of its support, SIDA established a non-governmental organization, Malonda Foundation for its implementation body, in 2005.

SIDA and Malonda Foundation have provided business development services (BDS) in order to attract foreign and domestic investment, including information provision on Niassa Province and assistance services to those who start business in Niassa Province.

They have succeeded in attracting and assisting forestry investors for establishing industrial tree plantations.

4.2.6 Issues on How to Support Sustainable Development of Industrial Tree Plantations and Wood Processing Industry

Forestry companies started to invest in and operate industrial tree plantations. The next issues include the following:

- To develop local processing industries using locally grown trees
- To improve transport systems of roads and railways to reduce costs for transporting fertilizers to and produced timber products from northern part of Niassa Province

4.3 Industry

4.3.1 Industry in Niassa Province

In Niassa Province, there are no large or medium-sized establishments of industry. Most industrial establishments are of small scale. Table 4.3.1 shows the number of registered establishments are over 600. However, most of them are grinding mills of maize grains.

Table 4.3.1 Number of Registered Industrial Establishments in Niassa Province

Industrial Category	2004	Increase from 2005 to 2008	Total
Grinding Mill	305	187	492
Bakery	36	8	44
Clothing	6	5	11
Wood Processing	3	1	4
Carpenters	16	14	30
Ceramics	2	3	5
Garage	12	3	15
Shoes	1	0	1
Total	381	221	602

Source: Provincial Directorate of Industry and Trade, 2008

Lichinga is a large city of over 140,000 population; however, it does not have any medium or large industries which provide a lot of employment. Lichinga City has only small-scale workshops. It is expected that Lichinga could attract some production companies requiring employment.

Niassa Province has a variety of agricultural produce. However, there are no developments of agro-processing factories which utilize local agricultural materials, such as cotton seeds and sunflower seeds.

It is considered that high transport costs and unstable road situation in the rainy season could be one of serious obstacles to development of the agro-processing industry.

4.3.2 Policy on Agro-Processing Industry and Timber Processing Industry

The Ministry of Industry and Trade has prepared a document called “Industrial Policy and Strategy”, which pays attention to the following roles of industry in the national economy:

- Development of internal linkages allowing diversification of the industrial base and markets
- Development of linkages between beneficiaries of industrial development by forming productive clusters
- Focus on areas that have a major economic and social impact, such as food processing industry, in order to maximize agricultural and fishery potential
- Promotion of vertical and horizontal integration of the food sector

- Promotion of industries that could allow adequate and sustainable exploitation of productive resources and capacities, such as timber processing and construction material industries
- Promotion of import substitution by development of metal, chemical and construction material industries
- Development and strengthening of Free Zones in order to attract both capital and labor intensive industries

As seen in these points, agro-processing industry and timber processing industry are priorities in the Industrial Policy and Strategy of Mozambique.

4.4 Mining

Potential deposits of various mineral resources have been known for many years. See Table 4.4.1. However, at present, not so many or not so large operations are being conducted.

One of the major obstacles to mining development in inland regions like Niassa Province is high cost of transport, not only for exporting mined produce, but also for importing machines, equipments and fuel for mining operation.

Table 4.4.1 Mineral Resources in Niassa Province

Mineral Resources	Location/ Districts
Gold	Lago District and up to Tanzania
Garnet	Cuamba District
Precious Stones	Districts of Cuamba, Nipepe, Maua, Mecula and Marrupa
Coal	Metangula District (Maniamba Basin), West of Lichinga Town
Industrial Minerals	Districts of Metarica and Nipepe
Marble	North to Lichinga and Majune District
Red Granite	Meponda District

Source: PEP, Niassa 2017

Garnet

Near Cuamba Town, a formal and modern mining operation of red garnet is underway.

Gold

In the north-west corner of the province, close to the Tanzania border, there is gold potential in Lupilichi. At present, informal artisanal gold mining activities are going on. Many of the gold miners are from Tanzania.

In 1998-99, a company conducted exploration of gold there. The quality of gold was considered good, but further exploration and mining operation were stopped due to internal reasons of the company.

At present, two companies are exploring the gold reserve in order to prepare a formal gold mining operation.

Coal

Niassa Province is formed by granites and gneiss. In the north-western part of the province, sedimentary rocks are found. Coal is associated with the formation of these sedimentary rocks.

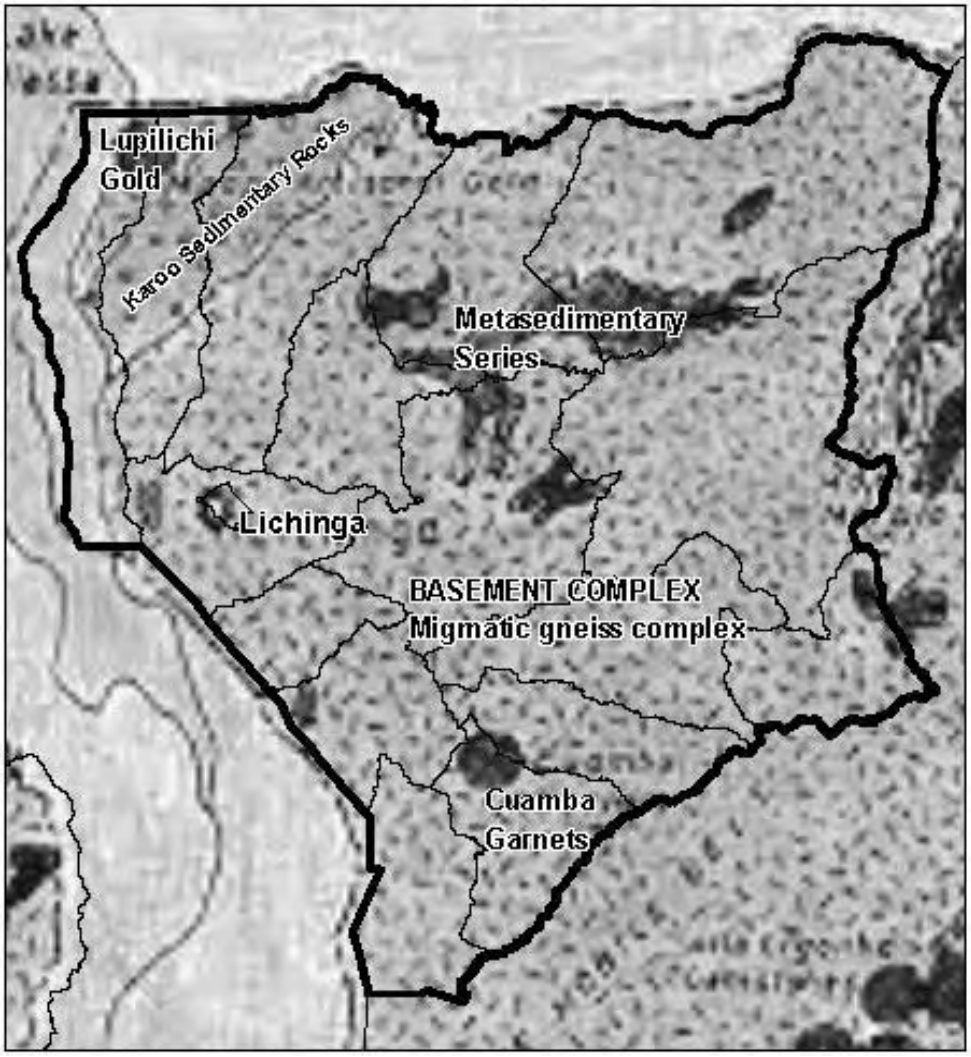
The coal reserve has been known for many years. At present, Vale, a Brazilian mining company, is exploring the coal reserve, and it will renew the exploration concession for five more years. The quality and quantity of the coal reserve is not known yet.

Uranium

In areas near Meponde and Cobue, exploration of uranium is underway.

Magnetite and Titanium

It is considered that there is potential for magnetite and titanium near Lake Malawi.



Source: Zoning and Identification of Areas for Investment in the Agrarian Sector and Socoio-Environmental Analysis for Niassa Province, Volume 2: Characterization of the Province and Zoning

Figure 4.4.1 Geological Formation and Mineral Potential

4.5 Commerce and Services

In Niassa Province, there are 51 establishments for wholesale function, as shown in Table 4.5.1. These wholesale shops are located mostly in the two major urban centers of Lichinga City and Cuamba Town.

Such wholesale shops are also found in Mandimba Town, Metangula Town (Lago District), Marrupa Town, Majune Town and Mecanhelas Town.

Table 4.5.1 Number of Licensed Wholesale and Retail Shops in Niassa Province

District	Number of Licensed Wholesale Shops (Functional Shops)	Number of Licensed Retail Shops (Functional Shops)
Total	51	405
Lichinga	0	18
Cuamba	16	85
Lago	1	10
Majune	1	3
Mandimba	3	16
Marrupa	1	8
Maúa	0	3
Mavago	0	2
Mecanhelas	1	4
Mecula	0	3
Metarica	0	1
Muembe	0	5
N'gauma	0	1
Nipepe	0	1
Sanga	0	7
Cidade de Lichinga	28	238

Source: Provincial Directorate of Industry and Trade, 2009

4.6 Tourism

4.6.1 Present Situation of International Tourism in Mozambique

In the last several years, the annual arrival of tourists to Mozambique has increased rapidly, reaching one million tourists in 2008. See Table 4.6.1.

This large growth in tourist arrivals took place partly due to legislative reforms for investors in the tourism industry firstly by establishment of a new tourism law in 2004. Moreover, the bilateral agreement between South Africa and Mozambique was concluded for allowing their citizens to freely travel between the two countries for up to 30 days without visas.

Table 4.6.1 International Arrivals to Mozambique

Purpose of Visit	2004	2005	2006	2007	2008
Tourism	470,000	578,000	664,300	771,000	1,025,554
Business/Conference	131,000	175,000	310,000	351,000	220,600
Leisure/Vacation	254,000	275,000	214,000	261,000	670,000
Visiting Families and Friends	85,000	128,000	140,300	159,000	134,954
Other Visits	241,000	376,000	430,700	488,000	482,500
Total Visits	711,000	954,000	1,095,000	1,259,000	1,508,054

Source: INE, Immigration

Table 4.6.2 Number of Overnight Stays of Nationals and Foreigners in Hotels in Mozambique

Province	2004	2005	2006	2007	2008	2008 % in Total	2008/2004 Increase Rate
Niassa	24,348	26,428	25,889	25,214	26,403	3.0%	1.08
Cabo Delgado	39,711	41,378	44,839	37,139	46,594	5.2%	1.17
Nampula	22,256	26,250	24,083	24,111	28,643	3.2%	1.29
Zambezia	35,797	36,710	37,663	43,275	44,523	5.0%	1.24
Tete	28,746	26,917	24,385	19,586	22,589	2.5%	0.79
Manica	13,719	11,356	11,634	13,964	21,090	2.4%	1.54
Sofala	40,455	42,147	53,986	70,002	79,241	8.9%	1.96
Inhambane	52,271	75,743	89,956	91,763	67,695	7.6%	1.30
Gaza	39,986	37,907	46,737	36,528	32,566	3.6%	0.81
Maputo Province	29,564	23,213	46,319	35,937	49,465	5.5%	1.67
Maputo City	373,897	358,194	488,150	474,784	474,077	53.1%	1.27
Total	700,750	706,243	893,641	872,303	892,886	100.0%	1.27

Source: INE, Survey of Hotel Establishments

However, the overnight stays of tourists and other visitors are concentrated in Maputo City as shown in Table 4.6.2.

The development of tourism attractions and tourism industry in Northern Mozambique is still underway, while Pemba beach resorts and islands of Cabo Delgado are already famous internationally.

4.6.2 Strategic Plan for the Development of Tourism in Mozambique (2004 – 2013)

The Ministry of Tourism of Mozambique established a strategic master plan of tourism for 2004-2013. The visions and strategies identified are as follows:

- By 2020 Mozambique will become the most vibrant, dynamic and exotic tourism destination in Africa.

- Mozambique tourism will be based on its beaches and coastal attractions, eco-tourism products and intriguing culture.
- Mozambique will receive over 4 million tourists a year.
- Conservation will be an integral part of tourism.
- Tourism could be a contributor to communities, as well as to the national economy.

In the tourism master plan, northern Mozambique is regarded as a high potential tourism area based on beaches, culture and nature.

4.6.3 Tourism Potential and Constraints in Niassa Province

In Niassa Province major tourism resources and possible tourism types are as follows:

- Wilderness in surrounding areas and inside of Niassa Reserve
  - ✧ Game hunting tourism
  - ✧ Eco-tourism
- Niassa Lake
  - ✧ Beach resorts
  - ✧ Water sports
  - ✧ Eco-tourism
- Local Villages
  - ✧ Village tourism
  - ✧ Traditional dancing and other social-cultural events
- Lichinga Town
  - ✧ City museum of history
  - ✧ Conferences
- Granite mountains
  - ✧ Sightseeing
  - ✧ Hiking

Among these resources, a limited number of tourist attractions have been developed, including the following:

- Game-hunting lodges in the Niassa Reserve
- Beach resort and eco-lodge in Cobue of Niassa Lake

In addition, based on Community-Based Conservation Areas, game-hunting lodges and eco-lodges are under preparation in Sanga District.

These existing tourist attractions provide very exclusive services in top-end markets. However, it is necessary to develop more tourist accommodations and attractions for non-exclusive tourists in order to make substantial impact on local economy.

Although the Ministry of Tourism has established a strategy promoting and marketing the Northern Region as a whole as described in the next section, no provincial level plan or strategy has been prepared.

Moreover, there is clear lack of local capacity of both government and private sectors in the following areas:

- To satisfy tourists by providing adequate services
- To provide adequate information on local tourist attractions and resources
- To attract international and domestic tourists
- To promote tourism development

4.6.4 USAID's Northern Mozambique Tourism Development Project

USAID's assistance project on Northern Mozambique tourism development analyzed and recommended that the region (Provinces of Cabo Delgada, Nampula, Niassa and Zambézia) should pursue the following image of tourism destinations:

- Exclusive destination for affluent segments, mainly marketed to international markets
- Image of exclusive 'island' destination with strong cultural influence along the coast and islands of Cabo Delgado
- Undisturbed nature of Niassa to be used for further niche market development (luxury eco-tourism, adventure, backpackers, hunting).
- Exclusive eco-tourism (adventure, birding, hunting, lake based) to be developed mainly in remote areas of Niassa and Cabo Delgado Province

Therefore, the Northern Mozambique Tourism Project also recommended that marketing and product development initiatives should strongly feature the exclusive and unique character of Northern Mozambique.

Key focus areas of Northern Mozambique are the Pemba, the Quirimbas, Ilha de Moçambique, Niassa Reserve and Niassa Lake. As shown in Figure 4.6.1, these areas would form a large "arc" linking the coast, inland nature reserve and Niassa Lake.

In accordance with these strategies, the following three projects based on Public-Private-Partnership (PPP) are proposed, and investment promotion materials have been prepared:

- Niassa Lake Resort Attraction Area Development in Metangla
- Lichinga Tourism Attraction Area Development
- Tourism Development Project of Mozambique Island and Surrounding

Areas

- Pemba Beach Resort Expansion and Upgrading Project

Source: Nathan Associates Inc. (2005), USAID's Northern Mozambique Tourism Development Project

Figure 4.6.1 Northern Mozambique Tourism ARC

In Figure 4.6.1 of the Tourism Arc in Northern Mozambique, no attention is paid to the Nacala Development Corridor, connecting Nacala, Nampula, Cuamba and Mandimba.

However, when the upgrading of Nampula, Cuamba and Mandimba Road becomes reality in the near future, it will be possible to promote tourism development oriented to bus and car utilization.[1] The road from Nampula to Cuamba provides tourists or drivers with viewing places of many scenic beauties of granite rocks. See the photo below.

[1] Annex 2: Maputo-Nampula-Cuamba-Niassa Reserve-Pemba-Ibo (Northern Self-Drive Market) in The Tourism Sector: A Value Chain Analysis in Mozambique Volume II, funded by IFC

4.7 Investment of Promotion

4.7.1 Investment to Niassa Province

Mozambique economy has attracted domestic and foreign investments in the last several years. See Table 4.7.1.

Niassa Province also attracted investments in the following areas:

- Industrial tree planting in 2006
- Mining exploration and tourism in 2007
- Tobacco, industrial tree planting and tourism in 2008

Table 4.7.1 Approved Domestic and Foreign Investments

Province	2006 (USD)	%	2007 (USD)	%	2008 (USD)	%
Total	850,209,001	100%	8,062,268,793	100%	1,080,254,032	100%
Niassa	80,000,000	9.4%	650,000	0.0%	20,003,350	1.9%
Cabo Delgado	10,618,133	1.2%	1,073,581	0.0%	13,254,370	1.2%
Nampula	14,037,051	1.7%	5,061,010,126	62.8%	87,486,117	8.1%
Zambézia	15,534,253	1.8%	10,196,835	0.1%	3,137,012	0.3%
Tete	17,155,938	2.0%	1,600,682,550	19.9%	38,143,465	3.5%
Manica	6,663,000	0.8%	14,269,404	0.2%	300,019,910	27.8%
Sofala	25,126,146	3.0%	173,049,242	2.1%	143,084,371	13.2%
Inhambane	25,944,451	3.1%	55,984,620	0.7%	39,198,739	3.6%
Gaza	6,745,714	0.8%	605,549,526	7.5%	56,672,341	5.2%
Maputo and Maputo City	648,384,314	76.3%	539,802,908	6.7%	379,254,357	35.1%

Source: CPI, 2009

4.7.2 Rapid Development Zones (ZRD): Investment Promotion Policy

The Government of Mozambique has designated Rapid Development Zones (RDZ) for providing fiscal benefits (exemption of custom duties and VAT for import goods of some types) in order to attract investment in the following economic sectors:

> a) Agriculture, b) Tree plantations, c) Aquaculture, d) Livestock raising, e) Forestry operations, f) Wildlife-related operations, g) Water supply, h) Electricity generation, transport and distribution, i) Telecommunications, j) Construction of public infrastructures, k) Housing construction, l) Construction of agriculture related infrastructures, m) Construction of hotel infrastructure and hotel operation, n) Tourism, o) Construction of trade infrastructure, p) Industry, q) Cargo and passenger transport, r) Education, and s) Health.

These fiscal benefits for investment were enacted by "Code of Fiscal Benefits" and enforced from January 12, 2009. The designated areas for Rapid Development Zones are as follows:

- Zambeze River Valley Zone (Tete Province, part of Zambezia Province and part of Sofala Province)
- Niassa Province
- Nacala District
- Mozambique Island
- Ibo Island
- Other areas which may be approved by the competent authority

Chapter 5 Infrastructures in Niassa Province: Present Situation and Existing Policies/Plans

5.1 Road

5.1.1 Road Network in Northern Region

Roads in Mozambique are classified by ANE into 1) Primary roads, 2) Secondary roads, 3) Tertiary roads, 4) Vicinal roads and 5) Other roads. See Figure 5.1.1. Primary roads are to connect provincial capitals. Secondary roads are complementary to primary roads, and tertiary roads serve to connect district centers to the road network.

The Northern Region covering three provinces, namely Nampula, Cabo Delgado and Niassa, has the following primary roads:

N1: Zambezi River - Pemba

N11: Milange - Malel (N1)

N13: Lichinga - Mandimba - Cuamba - Nampula

N14: Lichinga - Montepuez – Metoro

N103: Mutuali - Gurue - Nampevo

N104: Nampula - Angoche

However, among these primary roads, only N1, part of N14 (Lichinga-Marrupa and Montepuez-Metro), and part of N103 (Gurue-Nampevo) are paved. Other roads are waiting for upgrading projects.

Cuamba-Mandimba Road and Lichinga-Cuamba Road are among these unpaved primary roads.

<u>International and National Corridors</u>

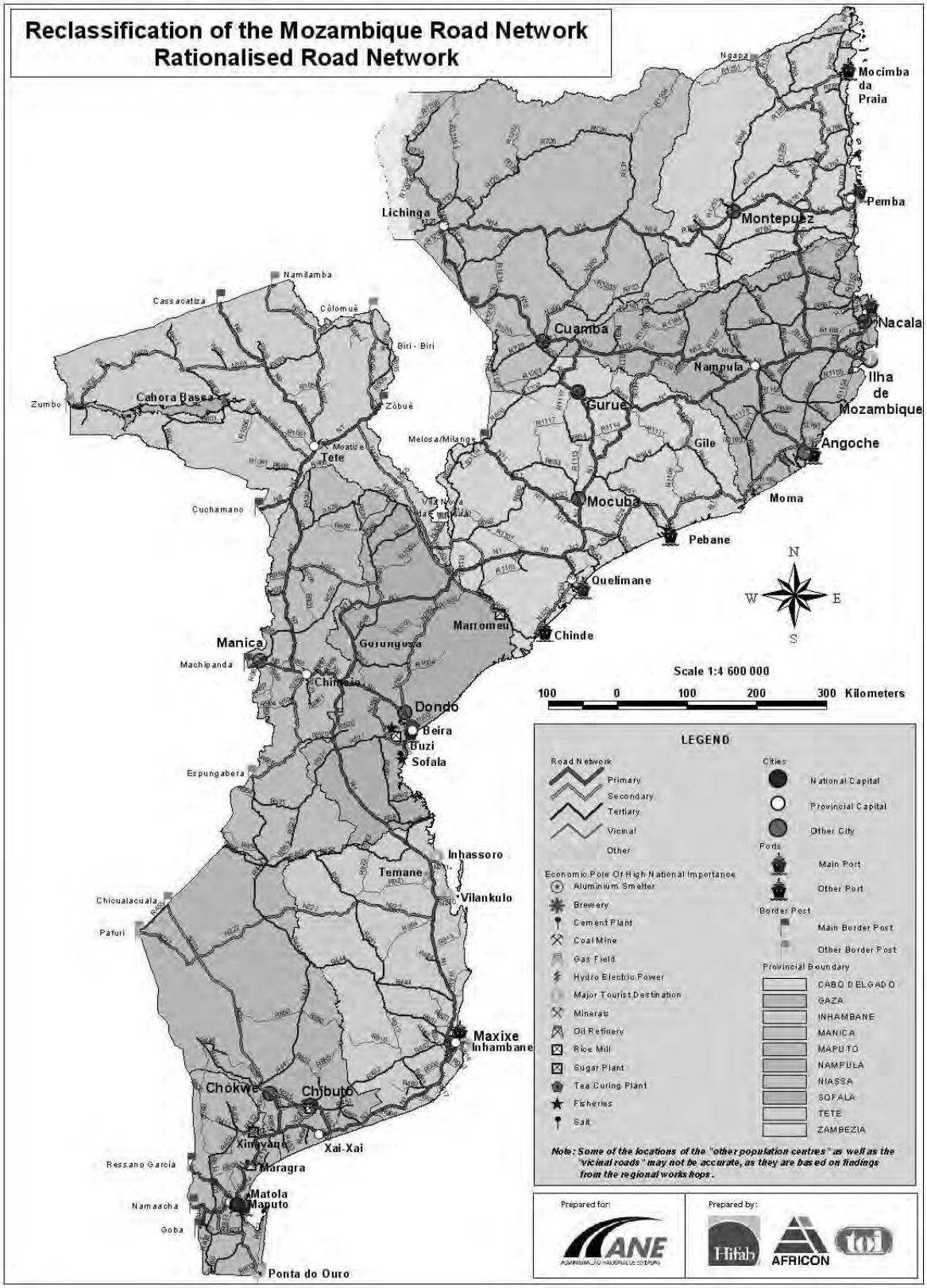
ANE identifies International and National Corridors as shown in Table 5.1.1 and Figure 5.1.2. In Northern Mozambique, four international corridors are identified, and the following two are connected to ports:

- Nacala Corridor connecting Malawi to Nacala Port
- Quelimane Corridor, connecting Malawi to Quelimane Port

In addition, there are the following two national corridors:

- Montepuez Corridor: N14 of Lichinga - Marrupa - Montepuez - Pemba
- Niassa Corridor: N13 and N103 of Lichinga-Cuamba-Gurue-Nampevo

These national corridors connect inland regions and provinces to the National Highway No.1 (N1). Both Cuamba-Mandimba Road and Lichinga-Mandimanba Road are part of the National Corridor of Lichinga-Cuamba-Gurue-Nampev.



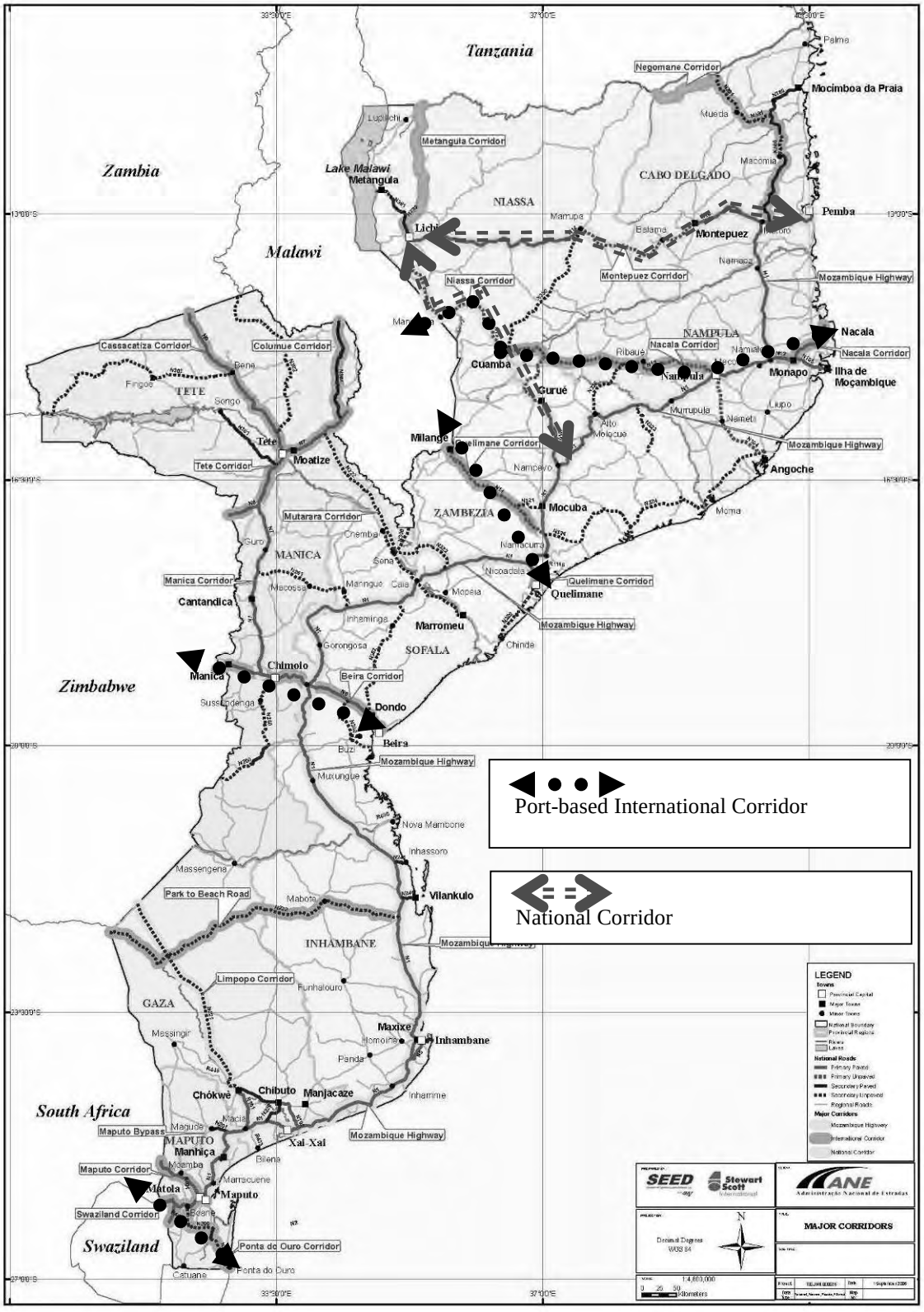
Source：ANE Website.2009

Figure 5.1.1 Road Network and Road Classification in Mozambique

Table 5.1.1 Identified International Corridors and National Corridors in Road Sector Strategy 2007-2011

Corridor (Connecting Country)	Main Nodes (Road Number)
National Highways	
1) Mozambique Highway	Maputo-Pemba (N1)
International Corridors	
2) Maputo Corridor (South Africa)	Ressano Garcia-Matola-Maputo (N4)
3) Beira Corridor (Zimbabwe)	Machipanda-Chimoio-Beira (N6)
4) Nacala Corridor (Malawi)	Nacala-Nampula-Cuamba (N12, N13, N1)
4) Tete Corridor (Zimbabwe, Malawi)	Cuchamano-Zobue (N7, N8)
6) Manica Corridor (Zimbabwe, Malawi)	Vanduzi-Changara (N7)
7) Quelimane Corridor (Malawi)	Milange-Mocuba-Quelimane (N11, N1, N10)
8) Swaziland Corridor (Malawi)	Matola-Namacha/Goba
9) Columue Corridor (Malawi)	Mussacama-Columue (N304)
10) Cassacatiza Corridor (Zambia)	Cassacatiza-Tete (N9)
11) Ponta do Ouro Corridor (South Africa)	Boane-Ponta do Ouro (N200)
12) Park to Beach Road (South Africa)	Parfuri-Mapinhane (N1)
13) Negomane Corridor (Tanzania)	Sunate-Oasse-Mueda-Negomane-Unity Bridge (N380, N381, to be designated)
14) Metangula Corridor (Tanzania)	Lichinga-Metangula and Lichinga-Macaloje-Matchedje (N361, R733, R1215)
National Corridors	
15) Montepuez Corridor	Lichinga-Marrupa-Montepuez-Pemba (N14)
16) Niassa Corridor	Lichinga-Cuamba-Gurue-Nampevo (N13, N103)
17) Limpopo Corridor	Macia-Chokwe/Guija-Macarretane-Chicualacuala (N101, N221)
18) Mutarara Corridor	Kambulatsisi (Tete)-Morrumbala (Zambezia) (N322)
19) Maputo Bypass	Moamba-Magude-Xinavane (R811 or R402, to be designated)

Source: ANE, 2006, Road Sector Strategy 2007 - 2011



Source: ANE (2006), Road Sector Strategy 2007-2011, Final Report

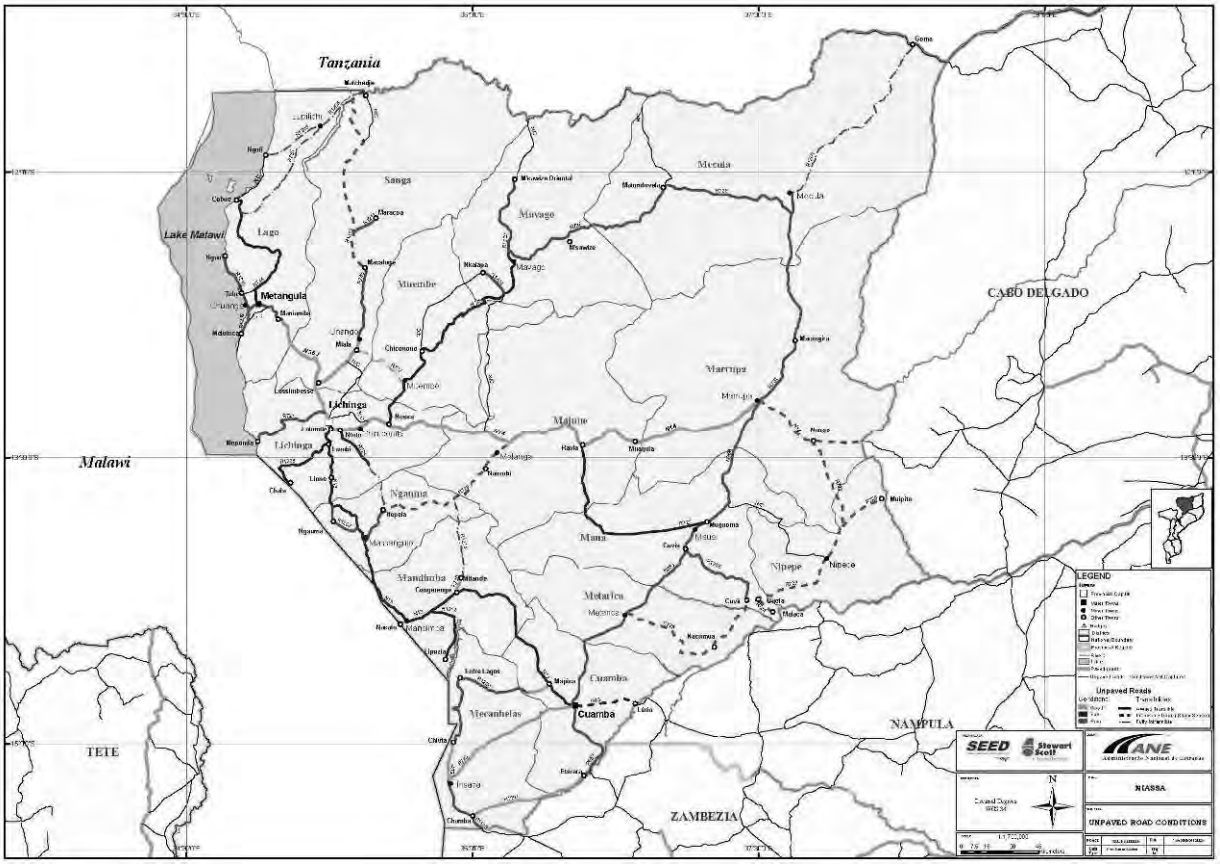
Figure 5.1.2 International and National Corridors Identified in Road Sector Strategy 2007-2011

5.1.2 Roads for Local Connection

Niassa Province has an extensive network consisting of primary, secondary and tertiary roads. Among these roads, tertiary roads are the most extensive. The tertiary roads connect district centers with the provincial capitals.

Primary Roads:	411 km
Secondary Roads:	240 km
Tertiary Roads:	1,082.0 km
Vicinal Roads:	478.0 km
Not Classified Roads:	352.5 km

Every year, ANE' provincial office does routine maintenance of tertiary roads, as well as primary and secondary roads, just after the end of rainy season. Districts are responsible for maintaining vicinal roads and other roads. However, ANE does routine maintenance work for some vicinal and other roads.



Source: ANE Website, 2009

Figure 5.1.3 Road Conditions in Niassa Province

5.1.3 Road Development Strategy 2007-2011

Road Development Strategy 2007-2011 is the second sector strategy formulated by reviewing of the first one (the Integrated Road Sector Strategy – IRRS, 2001) following a consultative process participated in by GOM officials, road sector professionals, donor agencies and other stakeholders.

The following six fundamental principles underlie the Road Development Strategy 2007-2011:

- Sustainability
  - Sustainability of maintenance
  - Financial sustainability
  - Sustainability of capacity
- Connectivity
- Accessibility
- Passability
- Assess Preservation
- Maintainability

Three of the six principles above are directly and strongly related to the issue of maintenance. ANE and this road sector strategy are clearly aware of the deep nature of road maintenance problems.

In fact, for the Northern Region of Mozambique, the maintenance work of paved roads, like Nampula-Cuamba-Mandimaba Road after the completion of road upgrading, is imperative for sustaining the vital connection and accessibility of road functions, as well as sustainable regional development.

However, in actuality, Mozambique has structured problems of road maintenance, in respect to finance, technical capacity and management. In this sense, road maintenance is one of the important issues on regional and local development.

5.2 Railway

5.2.1 Railways in Mozambique

In 2006, Mozambique had a total 3,123 km of railway lines. This length is the 55th longest railway network in the world. This network is comprised of 2,983 km of narrow gauge (1,067 mm) gauge and140 km of 762 mm gauge.

In Mozambique, there are four different railway networks which are not connected to each other. Those railway lines were designed and developed to mostly transport mineral resources from inland countries to sea ports in the colonial years.

5.2.2 Railways in Northern Mozambique

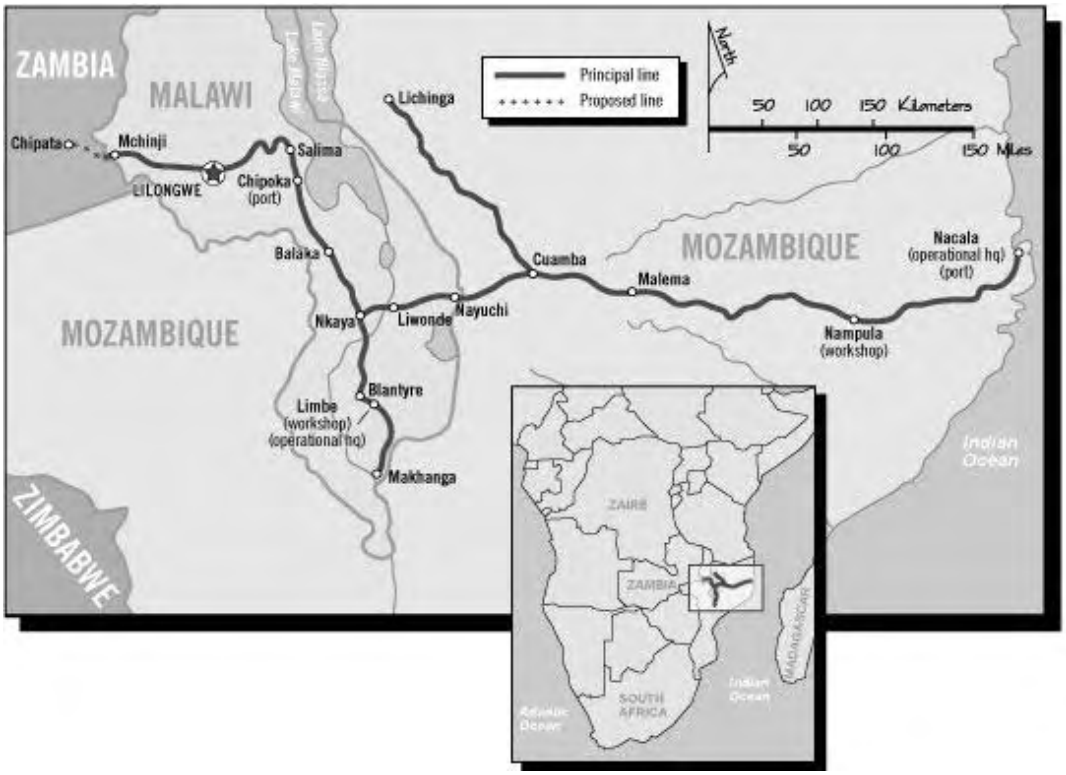
In the CFM-North, the first railway section (Lumbo-Monapo) was opened in 1914 and the final section connecting Cuamba to Malawi was completed in 1970. The railway line was extended and connected to Nacala Port in the late 1940's at the time of the opening of the port in 1951.

The CFM-North (872 km in total), consisting Nacala-Nampula-Cuamba (533 km), Cuamba-Entra Lagos (77 km) and Cuamba-Lichinga (262 km), is a significant part of Mozambique railways.

In addition to this Mozambique side of CFM-North, a company, the Corredor de Desenvolvimento do Norte (CDN) operates the Malawian railway system of 797 km mainline track.

CDN operates a railway network that stretches for more than 1,600 km in Mozambique and Malawi. In the near future this system will be connected into Zambia, after completion of a 27 km stretch of railway line. As a result, in the future, this railway system will connect Nacala Port to Chipata, on the Zambian border.

CDN transports containers, bagged and bulk freight, including liquid bulk. CDN operates passenger trains every day between Nampula and Cuamba. In mid 2009, the one-way fares of railway between Nampula and Cuamba are 132 MT for the third class coach and 350 MT for the second class coach.



Source: RDC and Bill Metzger

Figure 5.2.1 Map of Railway Lines in Northern Mozambique and Malawi

Table 5.2.1 Railways in Nacala Development Corridor

Lines	Length	Owner	Operator
Nacala-Cuamba	533 km	CFM	CDN
Cuamba- Entra Lagos	77 km	CFM	CDN
Cuamba-Lichinga	262 km	CFM	CDN
Nayuci-Nkaya-Lilongwe-Michinji Nkaya-Blantyre-Border	797 km	Malawi government	CDN
Michinji-Chipata	27 km	Malawi government	CDN

5.2.3 Concessions of Railway Operation

In 1990, the state railway of Mozambique became part of a state company operating ports and railways under the Ministry of Transport. The company is Empresa Nacional dos Portos e Caminhos de Ferro de Mocambique (CFM).

In 1995, a railway sector reform was started in Mozambique toward privatization with the assistance of the World Bank.

In 2000, for the CFM-North, a consortium called Sociedade de Desenvolvimento do Corredor de Nacala (SDCN) reached concession agreements with CFM on management and operation of the port and railway. SDCN and CFM has formed a new company (Compania de Desenvolvimento de Norte – CDN) to manage and operate the port and railway. SDCN owns 51 % and CFM owns 49 %, respectively, of the shares of CDN.

The concession agreements are for a period of 15 year from 2000.

CDN won the concession of Malawi Railway and established a company called Central East African Railways (CEAR). CEAR and CDN operate the Malawi railways.

The leading company in the consortium of SDCN and also in the CDN was Railroad Development Corporation (RDC), which is a US-based company. In 2008, RDC and ERL sold their stock to a Mozambican investment group.

Prior to the sale of the stock, among issues identified is slow pace of infrastructure improvement and poor operation performance of the CFM-North.

5.2.4 Railway Development Strategy of Mozambique

In May 2009, the Ministry of Transport and Communications established an Integrated Transport Development Plan covering sea transport, air transport, rail transport and road transport.

The following two railway corridors were proposed in the Integrated Transport Development Plan, in order to connect the existing railway corridors:

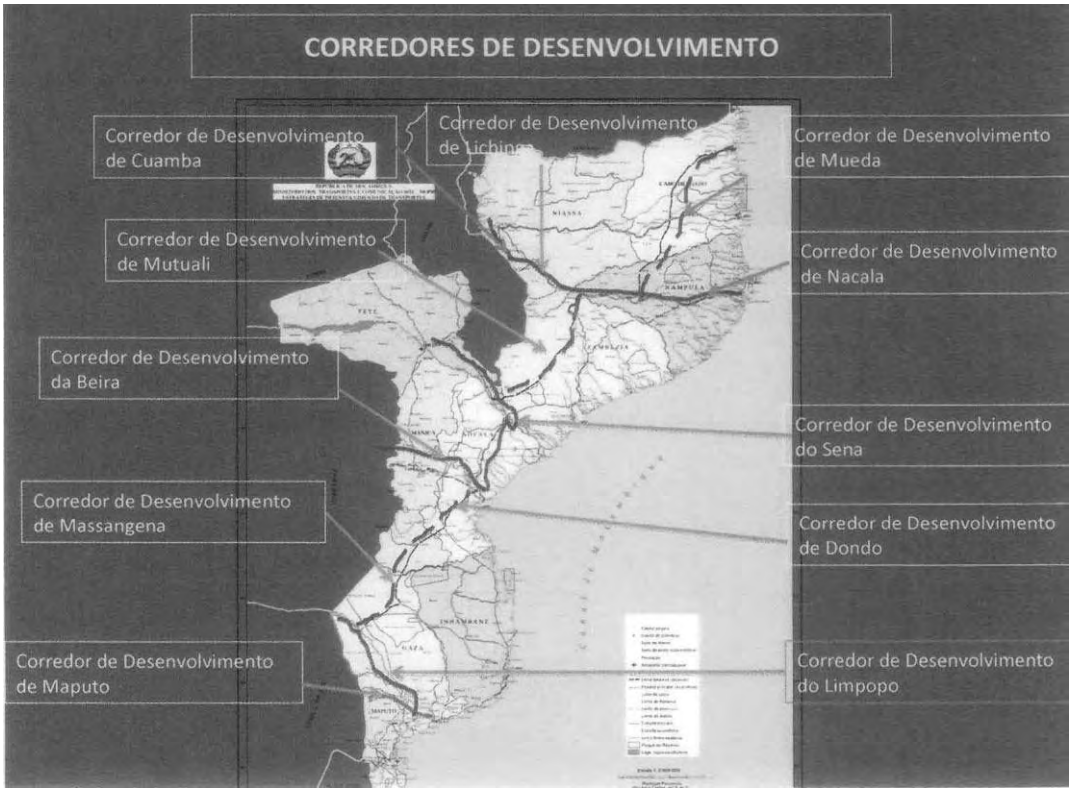
- A new railway corridor to connect Limpopo Railway (Maputo-Chokwé,-Chicualacuala-Zimbabwe) and Sena Railway Line (Beira-Moatize)

- Another new railway corridor to connect Sena Railway Line (Beira-

Moatize) and CFM-North Line (Nacala-Nampula-Cuamba-Entra Lagos-Malawi)

The dotted lines in Figure 5.2.2 show proposed new railway corridors.

As for the second new railway corridor, a high priority is given to the corridor from Nhamayabue (Sena Railway Line) to Mutuali (CFM-North Line) by the Ministry of Transport and Communications.



Source: Strategic Vision for Transport Development, Ministry of Transport and Communications, May 2009

Figure 5.2.2 Vision of New Railway Corridors

5.2.5 Railway Development Concept for Transporting Coal from Tete to the Port of Nacala through Malawi

As described in Section 8.2 of this report, several mining companies are exploring coal reserves and preparing for mining operations. One of the key issues on coal development is how to transport coal to ports for exporting.

The Moatize Project of Vale, a Brazilian mining company, has a plan to produce 1.1-2.4 million tons of coal annually for export initially. Then later its production is expected to reach 12 million tons per year. The project has a plan to use Sena Railway Line to transport coal to the port of Beira. However, it is considered the capacity of Sena Railway Line and Beira Port is not enough to accommodate coal transport demands derived not only from Moatize Project of Vale, but also from Benga Project of Riversdale, another giant coal project and other coal mining operations.

In October 2009, the Minister of Transport and Communications and Vale signed a minutes of understanding for their cooperation of railway transport between Moatiza and Nacala.

Vale will start a feasibility study to construct a new railway line from Moatize to Malawi in order to connect with Malawian Railway System and Mozambican CFM-North Line for transporting coal to the Port of Nacala. This project would include investment in rehabilitation of the Malawian Railway System and CFM-North Line. It will take one and half year to complete the feasibility study and by 2014 or 2015, construction for the new railway line and rehabilitation of existing railway lines is expected to start.

5.3 Public Transportation

Niassa Province can be characterized by poor development of public transportation at the local level, partly due to high vehicle operating costs.

At the inter-city or inter-regional level, railway services are relatively good between Cuamba and Nampula, although their train speeds are not high. Long-distance large bus services between Lichinga and Maputo through Gurue are available, but limited.

Within the Province, major public transportation modes are minibuses (capacity: 15 passengers) and open trucks. These are locally called shapa. There are about 10 minibuses which go from Lichinga to Mandimba and Cuamba within one day. About 10 minibuses come to Lichinga from Cuamba and Mandimba within one day. This frequency of minibus services is low compared to potential passengers. There are also some other routes, such as Lichinga-Metangula and Cuamba-Gurue.

The number of minibus operations is low, although the number registered for minibus services is over 170 vehicles. It is probable that many of those registered vehicles are not operational due to technical problems. It is difficult for minibus operators to get finance for their minibus business from banks.

The prices of minibuses are as follows:

- Lichinga-Cuamba: 360 MT
- Lichinga-Mandimba: 160 MT

These minibus prices are expensive for ordinary villagers. The unit price of minibus services is regulated to be 1.1 MT per km for one passenger. This is much higher than unit prices (0.625 MT per km for one passenger) in other regions. Smallholding farmers cannot afford to use minibuses for transporting their agricultural produce to market places in towns.

5.4 Telecommunication

The situation of telecommunication in Niassa Province is characterized by the

small coverage of mobile telephone networks, limited only to several district centers, as well as Lichinga City. See Table 5.4.1 for connection to mobile telephone networks in district capitals in Niassa Province.

In mid-2009, it was observed that internet and mobile telephone connection in Lichinga City and Cuamba Town was poor not for days but for weeks. This is critical not only in attracting new investments, but also for actual business operation.

Table 5.4.1 Connection to Mobile Telephone Networks in District Capitals in Niassa Province, 2009

District	Mobile Telephone Network Connection in District Capitals
Lichinga	0
Cuamba	0
Lago	0
Majune	No Connection
Mandimba	0
Marrupa	0
Maúa	0
Mavago	0
Mecanhelas	No Connection
Mecula	0
Metarica	0
Muembe	No Connection
N'gauma	0
Nipepe	0
Sanga	0
Cidade de Lichinga	0

Note: 0: Mobile telephone connection is available.

5.5 Electricity

In Mozambique as a whole, the electricity grid has been expanded largely and more cities and towns are connected to the grid. In 2006, only 50 of 128 district towns were connected to the electricity national grid. The government has a goal of connecting 101 district towns to the grid by 2010. [1]

Transmission lines reached Lichinga in 2005 by the assistance of SIDA and NORAD.

In Niassa Province, in 2009, only six district towns have electricity by connecting to the electricity national grid.

[1] Noticias, 5 April 2007, cited by Joseph Hanlon and Teresa Smart (2008), Do bicycles Equal Development in Mozambique?

Table 5.5.1 Connection to Electricity National Grid in District Capitals in Niassa Province, 2009

District	Connection to Electricity Grid in District Capitals
Lichinga	0
Cuamba	0
Lago	0
Majune	No Connection
Mandimba	0
Marrupa	No Connection
Maúa	No Connection
Mavago	No Connection
Mecanhelas	No Connection
Mecula	No Connection
Metarica	No Connection
Muembe	No Connection
N'gauma	No Connection
Nipepe	No Connection
Sanga	Partially Connected
Cidade de Lichinga	0

Note: 0: Electricity is available by connection to the national grid.

Chapter 6 Social Services in Niassa Province: Present Situation and Existing Policies/Plans

6.1 Health

Niassa Province has two hospitals. One is a provincial hospital in Lichinga Municipality and the other is a rural hospital in Cuamba Municipality. In addition to these hospitals, the health system is composed of health centers (46 facilities), health posts (89 facilities) and community health posts (42 facilities).

In 2008, one medical doctor per 43,400 people and one medical/health personnel per 870 people were available in Niassa Province. This situation of medical and health technical personnel availability was of very low level compared to other Sub-Saharan African countries.

In 2009 in Niassa Province one medical doctor is mobilized to each district. Then at present one medical doctor per 20,000 people is available. In the next five years, two medical doctors per district would be available for each district. District governments will have to provide houses for those medical doctors assigned in districts.

The health indicators of 2002-03 shown in Table 6.1.1 are generally not good. Since the rate of births attended by skilled health personnel (46%) is relatively high, this reveals that people's desire to get modern health services is not so low. With this desire for modern medicine, very high rates of under-five mortality and infant mortality mean that the quality of health services is poor, or people's access to health services is very limited.

Table 6.1.1 Health Indicators in Niassa Province

	Mozambique	Niassa Province
Mortality		
Under Five Mortality Rate (2003) per 1000 live births	178	206
Infant Mortality Rate (2003) per 1000 live births	124	140
Nutritional status		
Chronic Malnutrition among Children 0-5 Years (Stunting) (2003)	41%	47%
Acute Malnutrition among Children 0-5 Years (Wasting) (2003)	4.0%	1.3%
Children Underweight between 0-5 Years (2003)	23.7%	25.1%
HIV/AIDS		
HIV/AIDS Prevalence among 15- 49 Year Olds (2002)	13.6%	11.1%
Immunization		
Children 12-23 Months Fully Immunized (DPTHepB) (2003)	63.3%	46.6%
Children 12-23 Months Immunized against Measles (2003)	76.7%	51.9%
Maternity Care and Adolescent Fertility		
Fertility Rate (2003) per 1000 live births	5.5	7.2
Births Attended by Skilled Health Personnel (2003)	47.7%	47%
Births in Health Institutions (2003)	49%	46%

Source: UNICEF Mozambique

Between 2003 and 2008, infant mortality rates of Niassa Province substantially improved from 140 to 97.4. In the same period, under-five mortality rates of Niassa Province improved largely from 2006 to 122.9. See Table 6.1.2.

Table 6.1.2 Child Mortality Rates by Background Characteristics by Province, 2008

	10-year Period of Analysis (Number of Deaths per 1,000)		
Province	Neonatal Mortality	Infant Mortality	Under Five Mortality
Total	41.6	105.3	154.2
Urban	38.5	92.5	134.7
Rural	42.8	110.2	161.8
Niassa	41.2	97.4	122.9
Cabo Delgado	51.2	131.7	179.6
Nampula	41.1	104.9	139.6
Zambezia	60.1	147.1	205.2
Tete	40.9	107.5	174.4
Manica	26.9	93.5	153.6
Sofala	29.3	76.2	130.3
Inhambane	34.6	75.1	116.9
Gaza	36.6	97.8	164.9
Maputo Province	30.7	67.3	102.5
Maputo City	26.1	66.6	108.0

Source: Instituto Nacional de Estatistica (2009), Multiple Indicator Cluster Survey 2008, Summary.

Table 6.1.3 Vaccination in First Year of Life by Background Characteristics, 2008

Province	All Percentage of children from 12 to 23 months of age who have received all vaccines of BCG, DPT1, DPT2, DPT3, Polio 0, Polio 2, Polio 3, Measles	None Percentage of children from 12 to 23 months of age who have received none of vaccines of BCG, DPT1, DPT2, DPT3, Polio 0, Polio 2, Polio 3, Measles
Total	60.1	8.8
Urban	74.1	4.2
Rural	54.8	10.6
Niassa	56.2	4.4
Cabo Delgado	70.5	1.1
Nampula	51.0	13.0
Zambezia	46.8	20.2
Tete	34.2	10.4
Manica	58.3	9.1
Sofala	72.4	4.5
Inhambane	79.8	1.0
Gaza	73.9	1.1
Maputo Province	81.9	8.0
Maputo City	81.8	2.3

Source: Instituto Nacional de Estatistica (2009), Multiple Indicator Cluster Survey 2008, Summary.

6.2 Education

In Niassa Province, the primary net enrolment rates are still low (as shown in Table 6.2.1). This is partly due to problems on access to schools.

In 2009, Niassa Province has the following number of primary and secondary schools:

- 878 EP1-level (grades 1-5) of primary schools
- 150 EP2-level (grades 6-7) of primary schools
- 29 ES1-level (grades 8-10) of secondary schools
- 3 ES2-level (grades 11-12) of secondary schools

The government has changed teacher training systems in order to accelerate teacher training and to eliminate the need to recruit teachers who have no training by 2010. This change was done by shortening the training period for primary teachers from two years to just one year, but backed up with distance learning modules, and strengthening school supervision and inspection.

Given that enough qualified teachers are available due to the above mentioned policy changes, it is in theory true that to provide adequate education services is possible even in substandard physical environment. However, physical conditions of school buildings, especially EP1 schools in remote villages away from main roads, are of very poor quality. Many such school buildings have earth floor, and they have neither desks nor chairs. These neglected school buildings might negatively affect school children and teachers in learning and teaching.

In this situation, in the fiscal year 2009, only 16 schools got government finances to construct school buildings. The total budget for the 16 schools is 18.1 million Mt.

This is part of the Action Plan for Accelerated School Construction with controlled costs, with community participation, and involving local contractors and NGOs. Even though local communities are ready for contributing material and labor to school construction, it seems that local governments cannot provide enough funds to complete school buildings.

In addition to school buildings, houses for teachers are important for running village schools.

Table 6.2.1 Education Indicators in Niassa Province

Education and Illiteracy	Mozambique	Niassa Province
Primary Net Enrolment ate (2003)	61.0%	47.3%
Adult Illiteracy Rate (2003)	53.6%	64.4%
Female Illiteracy Rate (2003)	68.0%	68.0%

Source: UNICEF Mozambique

In Mozambique, the level of access to primary school has increased in recent years, as shown in Table 6.2.2. In Niassa Province, the net enrollment rate of

EP1 was 78.4 in 2008, while it was 32.4 in 1997 and 49.7 in 2003.

However, the share of pupils actually completing first-cycle primary school (EP1) of Niassa Province remained one of the lowest among provinces of Mozambique in 2003. See Table 6.2.3.

Table 6.2.2 Net Attendance Ration among Children 6-12 of Age by Province, 2008

Unit: %

Province	Boy	Girl	Total
Total	82.3	80.2	81.3
Urban	89.3	88.4	88.8
Rural	79.3	76.5	77.9
Niassa	78.6	78.3	78.4
Cabo Delgado	74.7	73.8	74.2
Nampula	74.2	73.1	73.7
Zambezia	84.7	81.2	83.0
Tete	70.4	67.1	68.8
Manica	87.0	83.0	84.9
Sofala	87.0	77.3	82.2
Inhambane	89.6	92.8	91.3
Gaza	89.1	92.8	90.9
Maputo Province	95.5	93.8	94.6
Maputo City	96.8	95.1	95.9

Source: Instituto Nacional de Estatistica (2009), Multiple Indicator Cluster Survey 2008, Summary.

Table 6.2.3 Primary School (EP1) Completion and Dropout Rates, by Province, 1997 and 2003

Unit: %

	Primary School (EP1) Completion		Primary School (EP1) Dropout	
Province	1997	2003	1997	2003
Niassa	62.0	61.7	17.9	19.5
Cabo Delgado	57.9	64.5	19.6	19.1
Nampula	59.1	64.9	18.7	17.0
Zambezia	51.0	57.3	26.8	20.5
Tete	61.0	68.7	24.1	14.8
Manica	62.7	67.9	14.3	11.8
Sofala	67.8	73.2	11.0	10.7
Inhambane	63.5	68.0	14.2	10.7
Gaza	60.1	67.7	16.6	13.2
Maputo Province	60.6	75.3	15.5	8.8
Maputo City	64.2	76.3	11.3	5.9
Total	60.6	67.5	17.1	5.9

Source: MEC Database, cited in World Bank (2008), Mozambique: Beating the Odds: Sustaining Inclusion in a Growing Economy, Volume 1: Main Report.

6.3 Water

6.3.1 Existing Water Supply Situation

In Niassa Province, the number of operational boreholes has been increasing at high rates, as shown in Table 6.3.1.

However, if it is assumed that 250 people are served rather than 500 people by one borehole, the coverage rates by district look very different. In the assumption of 250 people served per one borehole, the average coverage rate would come down to 37 %.

Table 6.3.1 Trend of Increase of Boreholes in Niassa Province

	2005	2006	2007	2008	2009
Existing Deep Wells	-	-	1,451	1,648	1,679
Operational Deep Wells	1,035	1,166	1,036	1,266	1,390
% of Non-Operational Deep Wells	-	-	28.6%	26.3%	19.9%
Rate of Increase Rate of Operational Boreholes (2005=100)	100	113	100	122	134

Source: Provincial Director of Public Works and Settlements, 2009

Table 6.3.2 Indicators on Water and Sanitation in Niassa Province

Water and Sanitation	Mozambique	Niassa Province
Access to Safe Drinking Water (2003)	35.7%	30.2%
Access to Sanitation (2003)	44.8%	70.0%

Source: UNICEF Mozambique

Table 6.3.3 No. of Boreholes and its Coverage Rates by District, 2009

District	Population	Operational Boreholes	Served Population				Coverage Rate (%) 500 People Served by One Borehole	Coverage Rate (%) 250 People Served by One Borehole
			Operational Boreholes	Boreholes	Small Water Supply System (PSAA)	Total		
Cuamba	107,610	238	208	104,000		104,000	96.6%	48.3%
Lago	75,504	137	109	54,500	600	55,100	73.0%	36.9%
Lichinga	95,172	191	163	81,500		81,500	85.6%	42.8%
Majune	29,722	44	18	9,000		9,000	30.3%	15.1%
Mandimba	136,238	232	197	98,500	1,125	99,625	73.1%	37.0%
Marrupa	58,683	53	48	24,000		24,000	40.9%	20.4%
Maua	49,486	87	79	39,500	750	40,250	81.3%	41.4%
Mavago	20,308	37	15	7,500	550	8,050	39.6%	21.2%
Mecanhelas	157,976	187	154	77,000	850	77,850	49.3%	24.9%
Mecula	14,524	25	22	11,000	800	11,800	81.2%	43.4%
Metarica	29,460	53	46	23,000		23,000	78.1%	39.0%
Muembe	29,083	37	29	14,500	700	15,200	52.3%	27.3%
Ngauma	65,436	118	91	45,500	900	46,400	70.9%	36.1%
Nipepe	30,532	65	59	29,500	800	30,300	99.2%	50.9%

Sanga	56,282	175	152	76,000	1,300	77,300	137.3%	69.8%
Total	956,016	1,679	1,390	695,000	8,375	703,375	73.6%	37.2%

Source: Provincial Director of Public Works and Settlements, 2009

6.3.2 Integrated Water Supply and Sanitation Project for the Provinces of Niassa and Nampula, 2000-2008

The project was implemented with support of a UA 15.77 million (US$23.6 million) loan of the African Development Fund (ADF)1. It aims to increase water supply and sanitation coverage and improve service to the rural population in the provinces of Niassa and Nampula. Various local and international NGOs including WaterAid are involved in the project implementation.

The major project components were as follows:

- Institutional development and capacity building;
- Environmental health education;
- Construction of water supply and sanitation facilities;
- Support for commercial network for spare-parts distribution;
- Support for monitoring and water conservation;
- Monitoring and evaluation;
- Studies;
- Project management.

6.3.3 Niassa Provincial Towns Water Supply and Sanitation Project

The project was approved by the African Development Fund (ADF) in April 2009. The objective of the project is to improve in a sustainable manner access to water supply and sanitation services in urban, peri-urban and rural communities within Lichinga and Cuamba towns in Niassa Province. The project components will consist of four dimensions:

- Institutional Development Support,
- Water Supply Rehabilitation and Extension,
- Sanitation Program and
- Project Management and Audit.

The project cost is estimated at UA 20 million (US$29.9 million), of which 90% will be covered by ADF loan and remaining 10% will be provided by the Mozambican government. The project will start in April 2010.

[1] African Development Fund (ADF) is a concessionary window of the African Development Bank (AfDB) Group

Chapter 7 Urban Sector in Niassa Province: Present Situation and Existing Policies/Plans

7.1 Cuamba Town

In response to the prospective upgrading of Nampula-Cuamba Road and Cuamba-Mandimba Road, it is considered that Cuamba Town would largely develop its economy as a major center of commerce and logistics in the southern part of Niassa Province. The services of commerce and logistics of Cuamba Town would be extended to much larger areas than the present service areas. Consequently, Cuamba Town would expand physically urbanized areas.

It is essential for Cuamba Town to prepare for future physical expansion of urban areas by formulating a future urban development plan. At present, Cuamba Municipality has established a structure plan in the short-term future. See Figure 7.1.1. However, the structure plan does not include any substantial expansion of urban areas and infrastructure/utilities in the future 10 years or 20 years from now.

In accordance with the preliminary design for upgrading of Nampula-Cuamba Road, the road enters into the urbanized area from the east and goes to the south crossing the railway line. This route forms a kind of small bypass avoiding the central area of Cuamba. However, in the future as mentioned earlier, Cuamba Town would become much larger than the present. Cuamba Town would require a large bypass or ring road to avoid the developed urban areas in 10 years or so.

Therefore, it is necessary to secure lands from now on for building a large bypass or ring road for Cuamba Town in the future. At the same time, lands for future sites of truck parking areas/terminals and logistic centers are also required. This type of land securing practice should be done by preparing a future urban plan/land use plan and road development plan.

7.2 Lichinga City

Lichinga, which used to be called Vila Cabral, was founded by the Portuguese in 1931. The town was designed to have a center with radial streets, as well as a road for through traffic from the north to the south. See Figure 7.2.1.

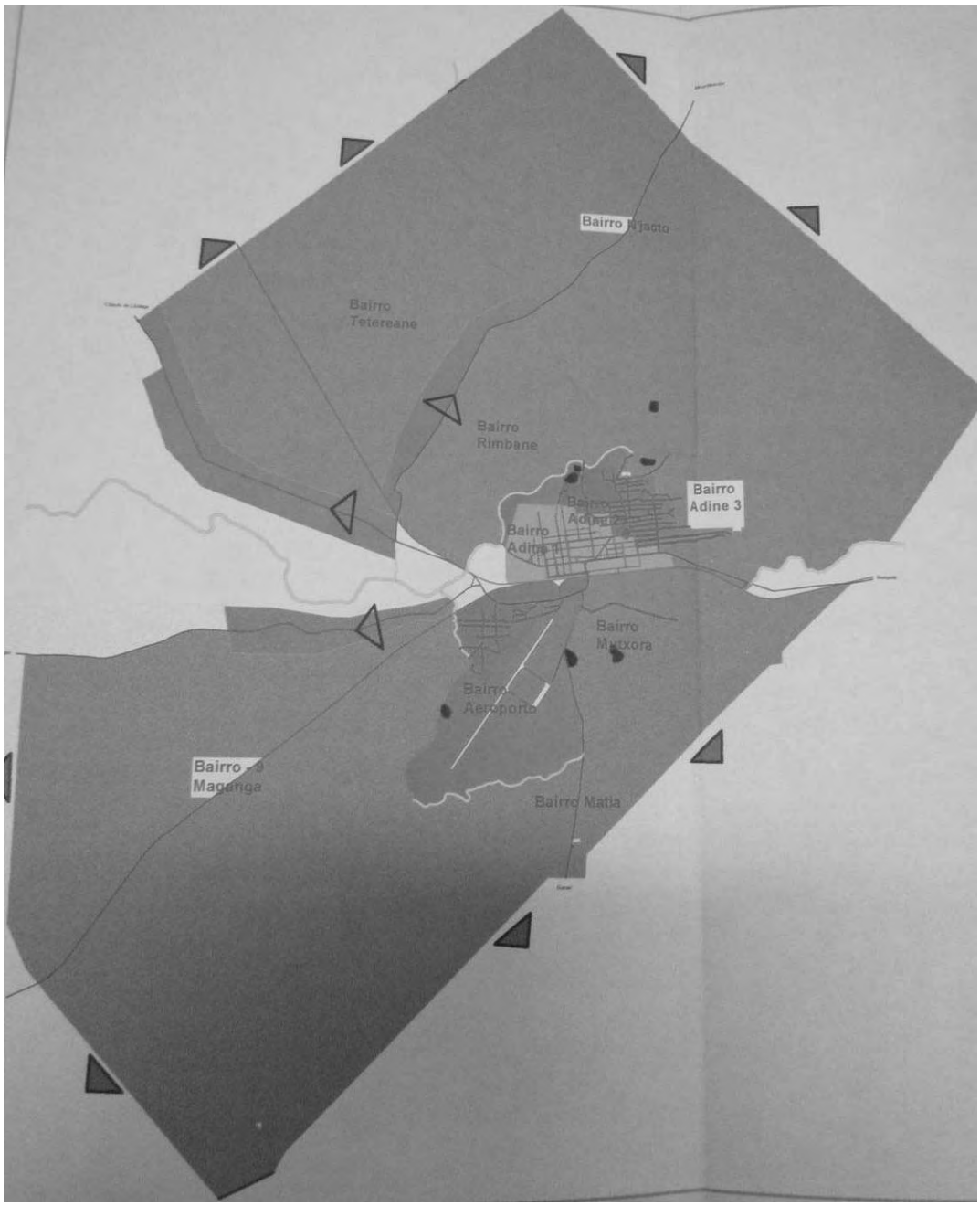
In 1962, Vila Cabral was upgraded to city status. In the early 1960s its population was 27,000. The city developed as an agriculture and colonial service centre until the independence in 1975. The city area is surrounded by pine tree plantations which used to be a mainstay of its economy.

In 2007, Lichinga City has over 140,000 population. Its urban areas are sparsely expanded in the surrounding areas of the planned central part. There are no urban public transportation services except for taxis. Even shapa are not run in the town.

No structure plans have been prepared for Lichinga Municipality, while there are noticeable problems on infrastructure and utilities.

7.3 Mandimba

Mandimba is a commercial town near the border with Malawi, and it is located between Lichinga and Cuamba. When the upgraded road of Nampula-Cuamba-Mandimba comes, Mandimba Town would grow its economy as a transit center or transport hub connecting to Lichinga, Cuamba and Malawi regions.



Source: Structure Plan of Cuamba Municipality (2009)

Figure 7.1.1 Proposed Land Use Plan of Cuamba Municipality

Source: Center of Study and Development of Settlements and Faculty of Architecture and Physical Planning of University of Eduardo Mondlane (UEM)

Figure 7.2.2 Land Use Map of Lichinga City, 2001

Chapter 8 Nacala Development Corridor and Niassa Province: Understanding of the Region

8.1 Characteristics of Nacala Development Corridor

8.1.1 Structure of Nacala Development Corridor

The Nacala Development Corridor (NDC) Initiative was officially launched by the two governments of Malawi and Mozambique in September 2000. The government of Zambia joined this initiative of NDC later in 2003.

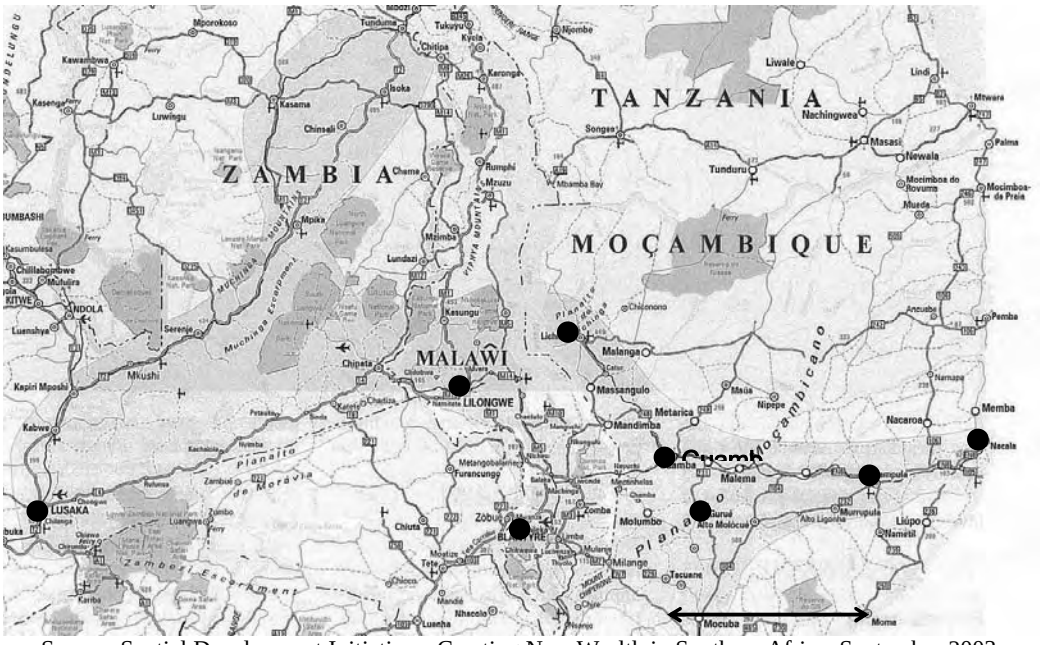
The geographical areas under envisaged Nacala Development Corridor are huge extending from Northern Mozambique, Central and Southern Malawi, and Eastern and Central Zambia as follows:

In Mozambique: Nacala Port, and the geographical areas bordering the CFM-North Line to Entre Lagos Railway Line and Cuamba-Lichinga Railway Line and Niassa Lake.

In Malawi: the whole southern region of Malawi and the following districts in the central region: Ntcheu, Dedza, Alima, Dowa, Lilongwe and Mchinji as well as the land surrounding Malawi Lake (Niassa Lake)

In Zambia, the NDC covers all districts in the eastern and northern provinces, Luangwa, Chongwe, Chibombo, Kabwe, Kapirimposhi, Serenje, and Lusaka district.

Figure 8.1.1 shows the areas to be incorporated into the Nacala Development Corridor envisioned by the Regional SDI Program.



Source: Spatial Development Initiatives: Creating New Wealth in Southern Africa, September 2003

Figure 8.1.1 Geographical Coverage of Nacala Development Corridor Proposed by SDI Approach

Originally the development vision of Nacala Development Corridor is based on the restoration and further development of traditional transport corridor of railway between Nacala Port and inland provinces of Northern Mozambique, Malawi and Zambia. National Highway No. 1 (N1) is also considered to be an important transport mode to support the Nacala Development Corridor.

However, N13 Road linking Nampula, Cuamba and Mandimba, as well as the road between Nacala and Nampula, has emerged as a significant international road link, since JICA started technical assistance for the feasibility study of upgrading of N13 in 2005-2006.

8.1.2 Recent Development in Nacala Development Corridor

Since the early 2000s, the following industry/mining and infrastructure projects have been planned and prepared for implementation:

Private Sector Development

- Oil refinery in Nacala
- Mining of heavy sands in Moma
- Re-opening of cashew nuts factory in Nampula
- Industrial tree plantations in Niassa Province and northern part of Zambezia Province

Infrastructure Development

- Expansion of water reservoir in Nacala
- Upgrading of airport of Nacala
- Development of Special Economic Zone in Nacala
- Upgrading of Nampula-Cuamba Road

These projects are mostly located near Nacala, except for Nampula-Cuamba Road and Niassa Province's industrial tree plantations. It can be said that the Nacala Development Corridor has been slow in development.

Besides these projects, there are many ongoing and planned projects under consideration concerning Nacala Development Corridor.

8.1.3 Comparison between Nacala Development Corridor and Maputo Development Corridor

Maputo Development Corridor has been regarded as a success example of international development corridor initiatives. It is considered worthwhile to study it for learning success factors. Some characteristics of Maputo Development Corridor are described in Section 2.4.5 in this report.

Table 8.1.1 shows comparison of Maputo Development Corridor and Nacala Development Corridor in terms of major characteristics.

Table 8.1.1 Comparison between Maputo Development Corridor and Nacala Development Corridor

	Maputo Development Corridor	Nacala Development Corridor
Countries in the Corridor	Inland: South Africa Coastal Country: Mozambique Port: Port of Maputo and Matola	Inland: Malawi and Zambia Coast: Mozambique Port: Port of Nacala
Distance	561 km by road between Johannesburg and Maputo 575 km by rail between Johannesburg and Maputo	1140 km by rail between Chipata (Malawi) and Nacala
Capacity of Private Investment	South Africa's private sector has good and stable capacity of investment. Mozambique's private sector has weak investment capacity.	Malawi's private sector has weak capacity of investment. Mozambique's private sector has weak investment capacity.
Investment Environment	In this corridor, South African side is inland. However, South Africa has safe and good environment for private investment. Mozambique's investment environment has been improved due to the Maputo Development Corridor Initiative.	Malawi is an inland country. Malawi's investment environment is not good. Malawi's country risk is high. Mozambique's investment environment is improving. However, Mozambique's country risk is high.
Public Investment Capacity	South Africa's government capacity for investment is strong, and South African government played an important role in infrastructure provision at the initial stage.	The government of neither Malawi nor Mozambique has strong capacity of investment in infrastructures. They have to rely on private and donors' assistance.
Demand for Cargo in the Corridor at the Initial Stage	Since the Port of Durban was congested, an alternative port is needed by South African and Zimbabwe. South Africa's mining resources to be exported are Fello-Chrome and coal. Zimbabwe is exporting Fello-Chrome through Maputo Port.	Since the existing trunk roads and railway are in bad conditions, the demand for the transport corridor including Nacala Port are not high enough to justify large-scale upgrading or rehabilitation of those transport infrastructure. It is considered that Tete's coal production could create large demand enough for rehabilitation of the CFM-North from Malawi to Nacala.
Bankable Projects	Aluminum smelter project in Mozambique side Metallurgical development projects are identified in South African side.	No good bankable projects have been identified yet in either Malawi or Mozambique.
Institutional Arrangement	Strong initiatives have been taken by Ministry of Trade and Industry (MTI) and Ministry of Transport and Communications of South Africa.	Although Ministry of Transport and Communication of Mozambique has a special unit of corridor development, no clear roles of the corridor unit have been designated or played yet.

Source: JICA Study Team

8.2 Tete's Coal Development and Nacala Development Corridor

8.2.1 Coal Mines in Tete Province

Tete Province has huge coal basins and is regarded as one of the last large unexploited coal basins in the world. The coal reserves are composed of hard coking coal and thermal coal product, consisting of exportable thermal coal and domestic thermal coal.

Hard coking coal is used primarily by the steel industry. The markets of hard coking coal would be Brazil, India and other countries in Asia, the Middle East and Europe.

Several companies have explored the coal reserves and conducted viability studies. Some of them are preparing mining operations.

Moatize Project of Vale, a Brazilian mining company, has a plan to start coal production in December 2011. The Moatize Project will produce up to 12.7 million tons of hard coking coal per year in the first phase.

Benga Project of Riversdale, an Australian mining company, is estimated to have coal reserves of 2.1 billion tons. In the first phase of Benga Project, it is expected to produce 1.7 million tons of hard coking coal per year and 0.3 million tons of export thermal coal. The coal production is expected to start in early 2011. Exports are expected to start in the second quarter of 2011.

8.2.2 Coal Transport for Export

Coal exports by various operators in Tete Province are considered to exceed the transport capacity of the Sena railway line, which links the coal basin to the Port of Beira.

Vale is examining the possibility of constructing a new rail line of around 200km from Moatize to connect to Malawi rail line in order to connect to the Port of Nacala in Northern Mozambique, and building a seaport terminal in Nacala.

Riversdale is investigating an option of using Zambezi River for coal transport to the mouth of the river, and then loading coal onto floating platforms, which are taken onto the sea, and transferring coal to large ocean-going vessels.

However, considering the limited cargo transport capacity of the Sena Railway Line and Beira Port, as well as prospective huge amounts of coal exports to be derived from the coal production plans of Vale, Riversdale and other investors, it is reasonable and inevitable to consider alternative transport options, such as river transport from Tete to Beira and new railway from Moatize to Nacala through Malawi.

8.3 Geographical Relation of Niassa Province to Nacala Development Corridor

Niassa Province is largely divided into two parts from the viewpoint of geographical relation to Nacala Development Corridor. One is the southern part, which includes districts of Cuamba, Mandimba, Mecanhelas and Metarica and

the other is the central and northern part covering the other districts of the province.

The southern part of Niassa Province, which includes districts of Cuamba, Mandimba, Mecanhelas and Metarica, is within Nacala Development Corridor. These districts would be under direct influence of the upgrading of roads and railways of the corridor.

On the other hand, the central and northern part of Niassa Province is at the fringe and surrounding areas of the corridor. As a result, it would have less impact or benefit from the upgrading of the roads and railways of the corridor.

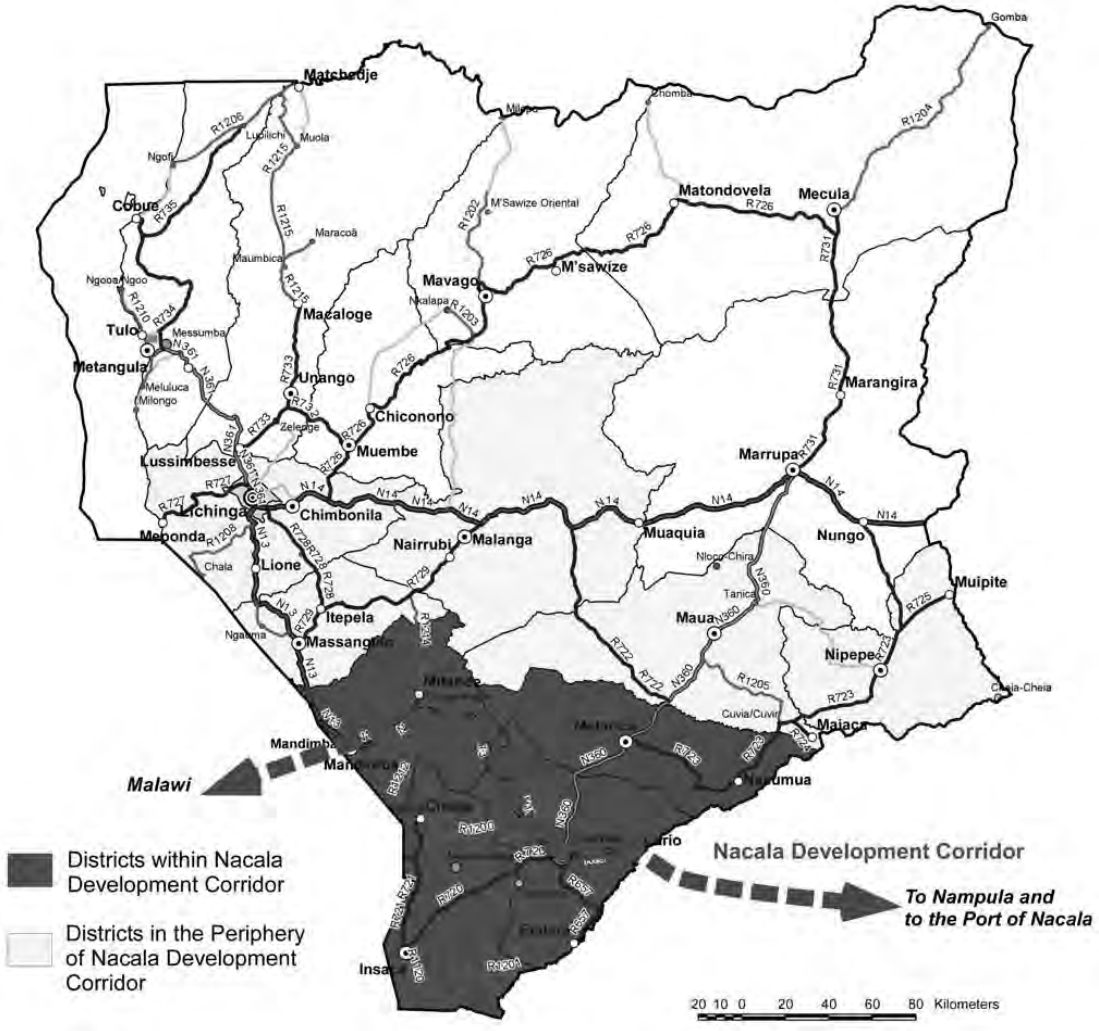


Figure 8.3.1 Niassa Province and Nacala Development Corridor

Chapter 9 Development Issues of Niassa Province

9.1 Development Potential and Future Prospects of Niassa Province

Niassa Province has inherent development potential in agriculture, forestry, mining and tourism. See Chapter 4.

Bad access conditions have hindered economic development in the province.

Huge areas, scattered populations and low population density have made it difficult to deliver basic social services to the people. See Chapter 6.

The majority of the provincial populationare rural and the majority of the rural population are smallholding farmers (smallholders). They grow a variety of food crops including maize, cassava and beans.

Bad access conditions increase transport costs for those small farmers

Therefore, it is difficult for small farmers to transport and sell their agricultural produce to market places. Small farmers have to wait for middlemen to come to villages or they need to bring their produce to nearby buying places by bicycle or on foot. Moreover, for cash needs, they have to sell part of food crops for their own family.

Niassa Province has good conditions for agriculture. However, its agricultural production is not always better than other provinces. In Niassa Province, there is much room for improvement of agriculture in technical production and commercialization.

Agriculture is important for Niassa Province. It is a major economic sector, which provides food and cash for the majority of people in the province. Road improvement creates better access for small farmers to market places and buying places.

The upgrading of Nampula-Cuamba Road and Cuamba-Mandimba Road could create good opportunities (including access improvement to markets) that can be utilized for regional economic development.

On the other hand, the districts in the periphery of the Nacala Development Corridor cannot get direct benefits, like increase of job opportunities and income generation, to their local economy.

As is described more in Section 8.2, the development of a new railway from Tete to Malawi and rehabilitation of the CFM-North from Malawi to Nacala would be necessary for coal export.

The combination of the upgrading of trunk roads between Nampula-Cuamba-Mandimba and the rehabilitation of the CFM-North could bring a very important impact to the regional economy of the corridor, resulting in increased development potential of wood-processing and agro-processing industries, even in the inland provinces, such as Niassa Province. These combined transport improvements could consolidate the foundation for promoting industrial

development.

From a long-term perspective, it is necessary to take actions, from now, for promoting development of economic sectors, including tourism, wood-processing and agro-processing industries.

Trunk road upgrading of Nampula-Cuamba-Mandimba is expected not only to bring more vehicle traffic to Cuamba Town and Mandimba Town, but also to increase their urban functions and result in physical urban expansion of those towns.

9.2 Emerging and Remaining Issues

The regional and local contexts will change in association with the upgrading of the two trunk roads, namely Nampula-Cuamba-Mandimba Road Lichinga-Montepuez Road.

What issues should be focused on more in the changing situation? What issues remain to be addressed? In this section, of the identified issues (emerging and remaining issues) are shown.

(1) Smallholder Commercialization <Remaining Issue>

There are a very limited number of people who actively grow cash crops including tobacco, cotton and beans. This is the case even along major roads in the northern part of Niassa Province. The upgrading of roads automatically neither creates the environment of commercialization nor encourage smallholders toward commercialization.

- How to promote smallholder commercialization by supporting agricultural associations for cash crop cultivation and marketing

(2) Urban Center Expansion <Emerging Issue>

Urban centers would grow their economy and urbanized areas in response to the upgrading of Nampula-Cuamba-Mandimba Road. The agglomeration of commercial and logistic activities of urban centers (Cuamba, Lichinga and Mandimba) could happen by expanding a geographical coverage of their services.

- How to physically prepare for urban expansion

- How to develop the function of logistics and transport centers

(3) Unpaved Trunk Roads <Remaining Issue>

Unpaved roads are always difficult problems for regional and local development. However, if trunk roads are unpaved and difficult to pass in the rainy season, this creates a serious hindrance to promotion of private investments, as well as regional and local development. A good example is Lichinga-Mandimba Road (part of N13). Routine maintenance of unpaved roads is not enough to improve the situation.

- How to make the upgrading of such trunk roads feasible

- How to introduce / promote private sector development which could create effective demand for such trunk roads

(4) Sustainable Business Environment <Remaining Issue>

Because of ambitious PEP Niassa 2017 and SIDA/Malonda support to business development services, private investments in industrial tree plantations have been made in Niassa Province. Furthermore, the following issues remain to be addressed:

- How to take advantage of the incoming private investments in industrial tree plantations for further promotion of regional development, including wood-processing industrial development

- How to create the business environment enabling the sustainable business operation

- What infrastructure to be developed to support the creation of such enabling business environment, including upgrading of Lichinga-Mandimba Road

(5) Complementing of Upgraded Roads and CFM-North <Emerging Issue>

In the Nacala Development Corridor, the upgrading of Nampula-Cuamba-Mandimba Road would activate economic development in the corridor; consequently, demand for railway would increase later.

On the other hand, when regional economy and car traffic volume grow after the road upgrading, then increased car traffic volume could increasingly damage the upgraded roads. In the long-term, both upgraded trunk roads and rehabilitated railways are required for strong economic development for Northern Mozambique, including Niassa Province.

- How to promote mutual complementation of the upgraded trunk roads and rehabilitated railways in order to form a strong corridor, including improvement of road access to railway stations in Cuamba and Lichinga

- How to promote and maintain adequate division of roles between trunk roads and railway

(6) High Transport Costs and Poor Development of Public Transportation <Remaining Issue>

Transport costs are high in regions served by unpaved roads. As a result, development of public transportation is poor and their fares are high. As a result, small farmers cannot use trucks or shapa for transporting their agricultural produce to market places. As a result, middlemen buy agricultural produce at lower prices from farmers. As a result, prices of daily goods and industrial material/fuel are high.

- In addition to road upgrading, how to promote the development of public

transportation both for passengers and goods

- For the government, how to intervene in the development of public transportation

(7) Minimum Level of Social Services (Water, Education and Health) <Remaining Issue>

As poor road conditions prevail, minimum social services on water supply, basic education and health services are lacking and of poor quality. For enhancing local and regional development, it is not enough to promote economic development by economic infrastructure, such as roads and electricity. It is necessary to improve social services locally.

It is necessary to pay attention to characteristics of village settlement patterns in Niassa Province. They live along major roads. However, their agriculture fields distributed far from major roads. They live near agricultural fields in busy seasons.

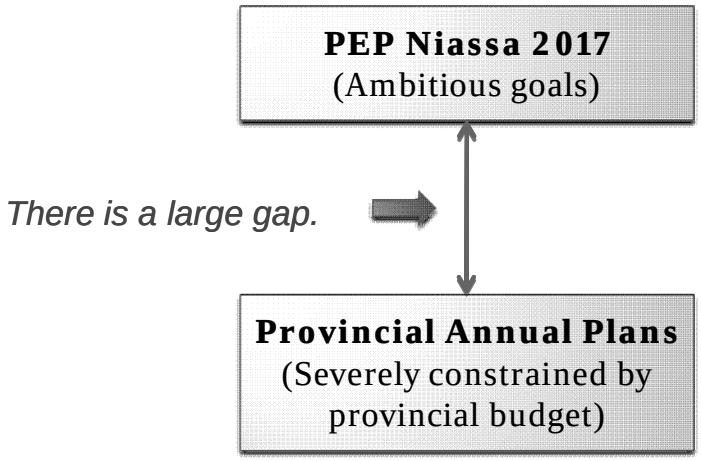
- How to promote the provision of social services up to the minimum level, by paying attention to local situations

- How to encourage people to use those social services in order to improve their livelihood and children's future

Chapter 10 Vision, Objectives and Strategies for Middle-Term Regional Development Program

10.1 Introduction and Background

In the Study, it is recognized that it is necessary to fill the gap between PEP Niassa 2017 (which has ambitious goals) and Provincial Annual Plans (which are severely constrained by provincial budgets) by formulating and implementing middle-term programs.



Moreover, it is necessary to update the activities for the latter five years (2013-2017) of the 10-year period of PEP Niassa 2017, based on the review of the progress of the first five years (2008-2012). In this review and update, it is essential to re-clarify which interventions should be emphasized and to which directions of development effort should be promoted more by considering not only the period of 2013-2017, but also beyond the 10-year period (2008-2017) .

In 2013, it is supposed that the upgrading construction of Nampula-Cuamba Road (N13) will be completed. Furthermore, it is expected that in 2014, the upgrading project of Cuamba-Mandimba Road will also be completed.

By the early 2000s, it is considered that CFM-North will be the only viable transport mode to constitute the Nacala Development Corridor (NDC). National Highway No.1 (N1) will be a supplementary transport mode for supporting NCD. However, since 2005 or so, the expectation of upgrading Nampula-Cuamba-Mandimba Road has become a reality to achieve a continuous road link from Nacala Port through Northern Mozambique to Malawi and Zambia.

10.2 Vision and General Objectives of Middle-Term Regional Development Program for Niassa Province

10.2.1 Vision and General Objectives for Middle-Term Regional Development Program

Visions and general objectives for the middle-term regional development program for Niassa Province are to be the same as those of PEP Niassa 2017.

Vision	- To have consolidated bases for fighting poverty and promoting accelerated and sustainable development.
General Objectives	- Accelerate and consolidate the economic, social and cultural development of the province - Reduce poverty by 15% by 2017

10.2.2 Desired Future of Niassa Province

(1) Transport

Transport conditions in the past

Niassa Province had been abandoned for a long time with bad transport conditions, due to the long civil war and its disadvantageous location in the inland and northern end of the country.

Present conditions being improved

However, Niassa Province has been linked with the regional road network via Tete and Malawi, as a result of the improvement of roads in Malawi and the improvement of the road connecting National Highway 1 and Tete Province.

In addition, National Road 103 between Cuamba and Nampevo has been gradually improved; therefore the road access to Niassa province is being improved.

There is a railway between Cuamba and Nampula. The railway serves for passengers as well as small-scale goods transport carried by passengers.

Mid-term future of transport improvement

Year 2014: The road between Nampula and Cuamba is upgraded.

Year 2016: The road between Cuamba and Mandimba is upgraded.

By around 2020: The railway is developed/improved from Tete to the Port of Nacala along the Nacala Development Corridor.

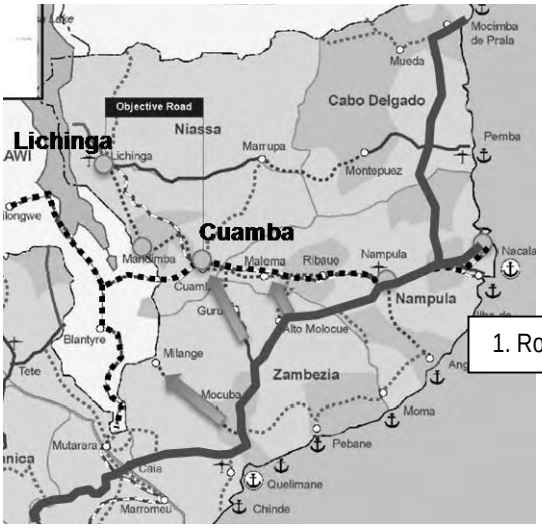
By around 2015: The trunk road from Lichinga to Cuamba is improved, and it can be used for the transport of timbers produced at industrial tree plantations and wood products processed within the province. (Railway will be used from

Cuamba.)

Long-term future of transport improvement (after 20 years)

The railway between Lichinga and Cuamba is rehabilitated. Timbers and wood products are transported by the railway to Nampula and to the Port of Nacala via Cuamba.

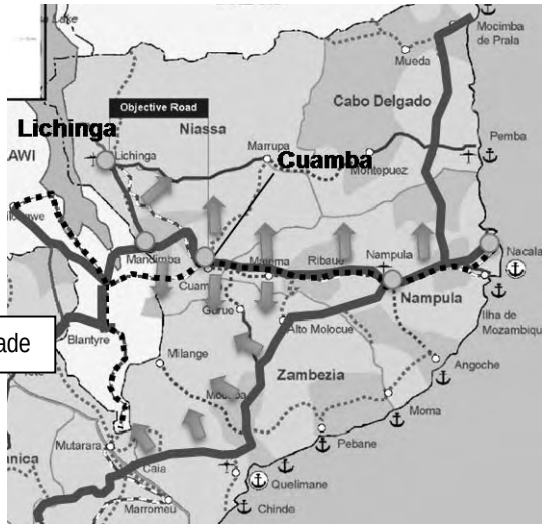
Current Condition



- Not Upgraded Railway
- High way No.1

1. Road Upgrade

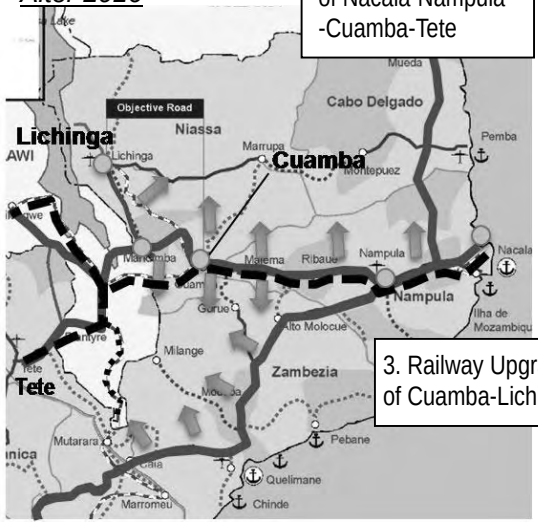
2016



- Not Upgraded Railway
- Upgraded Road of Nacala-Nampula-Cuamba-Mandimba
- Highway No.1

2. Railway Upgrade of Nacala-Nampula -Cuamba-Tete

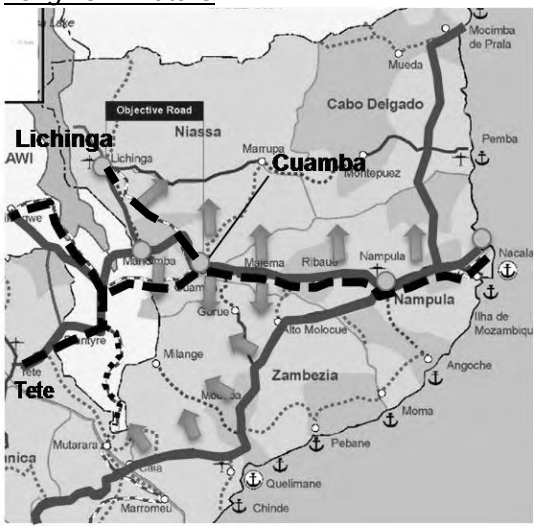
After 2016



3. Railway Upgrade of Cuamba-Lichinga

- Upgraded Road of Nacala-Nampula-Cuamba-Mandimba
- Upgraded Railway of Nacala-Nampula-Cuamba-Tete
- Upgraded Road of Mandimba-Lichinga
- Highway No.1

Long Term Future



- Upgraded Road of Nacala-Nampula-Cuamba-Mandimba
- Upgraded Railway of Nacala-Nampula-Cuamba-Tete
- Upgraded Road of Mandimba-Lichinga
- Upgraded Railway of Cuamba-Lichinga
- Highway No.1

Figure 10.2.1 Future Improvement Scenario of Transport Network in Northern Mozambique and Malawi

(2) Agriculture and Rural Life

a. Agricultural production is active and rural life is improved.

Agriculture and Rural Livelihood

- Large scale tree plantations and farms increase, but small scale agriculture remains as major agricultural activities of the Niassa Province.
- Agricultural commercialization is activated by road access improvement, increasing number of middlemen, and healthy competition among them.
- Farmers are organized into agricultural associations, and improve transport and marketing of agricultural products.
- Local agro-processing industries are developed, which provide stable market for local agricultural products.
- Smallholders produce agricultural products more for selling.
- Beans, specialty of Niassa Province, are produced and sold more.
- New cash crops are introduced, produced and sold.
- Smallholders produce enough maize for family consumption throughout the year.
- More various vegetables are produced to improve family consumption.
- Opportunity for proving labors to large-scale industrial tree plantations increase.

Water

- The number of deep wells increases and population is sparse in rural areas with access to the deep wells.
- People have access to safe water throughout the year.

Education

- Number of schools, which covers higher grades, increases in rural villages.
- Children have opportunity for primary education, and the number of children graduates from primary school increases.
- The number of children who study at secondary school increases.
- Rural people get jobs at towns by getting school education.
- Smallholders adopt improved agricultural technology and improve agricultural commercialization by getting school education.

b. Agricultural production is active to market the products in the Northern Region of Mozambique, and further outside the Northern Region.

- Large volume of agricultural products is shipped to the market of the large city Nampula.
- Large volume of agricultural products is shipped to agro-processing industries in Nampula.
- Large volume of agricultural products is shipped to Central Region of

Mozambique via Cuamba and Gurue.

(3) Local Industries and Business

a. Local industries including agro-processing and tourism are developed in Niassa Province

Agro-Processing Industry

- Agro-processing factories are developed by attracting domestic investors.

Tourism

- Tourist facilities are developed around Niassa Lake, Niassa Reserve and other natural reserves by attracting private investment.
- Towns of Lichinga and Cuamba are developed as tourist centers located along the tourist routes from Malawi to Mozambique and from the coastal resorts of northern Mozambique to inland Mozambique.
- Local tourist business such as hotels, restaurants and rent-a-car services increases and provides tourists with quality services.

b. Large to medium-scale industries are developed with foreign investment

Wood-Processing Industry

- Large to medium-scale foreign investment in wood-processing industry is promoted.

Mining Industry

- Mining projects (e.g. coal) will start in the northern part of Niassa Province and around the Niassa Lake.

(4) Towns

a. Towns in the southern part of Niassa Province serve as functional logistic centers for Nacala Development Corridor, and provide job opportunities for the local people.

Cuamba

- Cuamba Town functions as a logistics center with developed infrastructure and facilities.
- Industrial estate is developed.
- Urban commercial and service industries are located.
- Public services including water supply, sewerage and solid waste management are provided for urban population.

Mandimba

- Cuamba Town functions as a logistics center with developed infrastructure and facilities.
- Urban commercial and service industries are located.

- Public services including water supply, sewerage and solid waste management are provided for urban population.

b. Lichinga town is developed not only as a provincial capital, but also as a functional logistics center and a tourist town.

- Lichinga Town functions as a logistics center with developed infrastructure and facilities, for mining industry (coal), and wood-processing and agro-processing industries.
- Attractiveness of Lichinga Town increases as a tourist town.
- Urban commercial and service industries are located.
- Public services including water supply, sewerage and solid waste management are provided for urban population.

10.3 Basic Strategies

Basic strategies are set for making maximum use of development potential of Niassa Province and Nacala Development Corridor to guide the formulation of sectoral strategies, as follows:

Basic Strategy 1: Upgrading of the trunk road of Nacala Development Corridor in order to promote regional development not only within Nacala Development Corridor but also in its periphery by making use of their development potential

Basic Strategy 2: Make the most of development opportunities to be created due to the prospective development of a new rail link between Tete and Malawi and rehabilitation of CFM-North of Nacala Development Corridor for exporting Tete's high-quality coal, as well as due to the upgrading of the trunk road of Nacala Development Corridor

Basic Strategy 3: Promote the development of smallholder agriculture and agro-processing industries by making the most of agricultural potential in the region

Basic Strategy 4: Promote the sustainability of industrial tree plantations and the development of wood-processing industries so that they could be new mainstays of the future economy in the central and northern part of Niassa Province

Basic Strategy 5: Reduce economic and social disparity between the inside of the Nacala Corridor and the periphery of the Nacala Corridor by taking necessary measures

10.4 Sector Strategies and Possible Measures

The four basic strategies described above could be guideline for formulating individual sector strategies.

Sector Strategy 1: Transport Infrastructure Development

Possible Measure 1-1: Upgrade Cuamba-Mandimba Road to ensure high mobility on the trunk road from Nacala Port to the border with Malawi, through Nampula and Cuamba

Possible Measure 1-2: (a) Develop a bypass road for Cuamba Town and other facilities including truck parking areas/truck terminals along the bypass road, industrial estates along the bypass road, access road to Cuamba train station and loading-unloading facilities of Cuamba train station for integrating road and railway transport. (b) Establish a town plan of Cuamba Town for accommodating these facilities and for securing lands for these facilities.

Possible Measure 1-3: (a) Develop a bypass road for Mandimba Town and truck parking areas along the bypass road. (b) Establish a town plan of Mandimba Town for accommodating these facilities and for securing lands for these facilities.

Possible Measure 1-4: Upgrade Lichinga-Mandimba Road for connecting to Nampula-Cuamba-Mandimba Road and for ensuring safe and smooth transport of vehicles all the year around.

Sector Strategy 2: Smallholder Agriculture Commercialization

Promote commercialization of small farmers' agriculture in the central and northern part of Niassa Province, where small famers' commercialization has been underdeveloped.

Possible Measure 2-1

Assist small farmers in organizing their agricultural associations and in marketing their agricultural produce.

Follow the approach adopted by CLUSA for smallholder commercialization and value chain development.

Possible Measure 2-2

Assist small farmers in their agricultural technical improvement.

Sector Strategy 3: Development of Agro-Processing Industry

Promote development of agro-processing industry using local agricultural products.

Possible Measure 3-1

Conduct a feasibility study of agro-processing industrial development in Niassa Province, in order to clarify potential products and markets, as well as to establish a development strategy for agro-processing industry.

Possible Measure 3-2

Provide business development services on agro-processing industry for private investors, in accordance with the established development strategy for agro-processing industry.

Sector Strategy 4: Tourism Development

Develop local capacity of both government and private sectors for tourism development.

Possible Measure 4-1

Establish a tourism development strategy at the provincial level of Niassa.

Possible Measure 4-2

Conduct activities for local-level capacity development for tourism, including organizing seminars and workshops on what are better services for tourists, by involving tourist operators, such as hotels, rental cars and restaurants.

Possible Measure 4-3

Start up a tourism board involving government and private sectors at the provincial level, and start activities for local capacity development, tourism promotion, small facilities development, such as tourist information centers, museums and sign boards.

Sector Strategy 5: Development of Wood Processing Industry

Promote the development of wood processing industry utilizing wood to be produced locally from increasing industrial tree plantations.

Possible Measure 5-1

Provide and expand business development services for foreign companies and investors who are interested in the wood processing industry.

This is designed for attracting middle and large-scale operations of wood processing.

Possible Measure 5-2

Promote local development of small and medium enterprises (SME) of wood processing industry.

It would be necessary to encourage the linkage between foreign companies and local SMEs in the wood processing industry.

Sector Strategy 6: Improvement of Social Services

Upgrade the levels of social services to adequate levels in villages of central and northern districts, which are within the periphery of the corridor.

Possible Measure 6-1

Improve district-level capacity of development planning and project implementation for improvement of social services and minor roads at the village level.

In addition to sectoral vertical approaches, adopt an integrated approach paying attention to actual situations of districts and villages, especially village settlement patterns.

Sector Strategy 7: Mineral Resources Development

Promote mineral resources development by promoting private investment in the northern part of Niassa Province.

Possible Measure 7-1

Promote private investment to exploration of mineral resources and further to mining development, by conducting studies on geological models in relation to mineral resources and by providing information of geological models to the public.

Chapter 11 Priority Programs and Projects

11.1 Priority Programs and Projects for Regional Development in Niassa Province

Possible measures discussed in the previous chapter need to be translated into implementable priority programs and projects.

The preparation of priority programs and projects requires some further studies.

11.2 Necessary Studies for Preparing Priority Projects for Regional Development in Niassa Province

The preparation of priority programs and projects requires some further studies.

The following studies were indentified and prepared for regional development with Niassa Province based on intensive discussions.

1. Project of Supporting Smallholders in Agricultural Commercialization in Northern Part of Niassa Province
2. Study on Development Strategies for Agro-Processing Industry in Niassa Province
3. Study on District Development Planning and Management in Niassa Province
4. Small Study on Tourism Development Strategies and Capacity Building in Niassa Province
5. Study on Village Water Supply Planning and Management in Niassa Province
6. Study on City Planning of Cuamba, Mandimba and Lichinga in Niassa Province
7. Study on Geological Models for Mineral Resources Exploration in Northwestern Part of Niassa Province

11.3 Project of Supporting Smallholders in Agricultural Commercialization in Northern Part of Niassa Province

(1) Objectives

<Part 1>

- Situation Analysis of Smallholder Commercialization
- Preparation of Strategies for Supporting Smallholder Commercialization
- Detailed Project Design of Supporting Smallholders in Agricultural Commercialization

<Part 2>

Support to Agricultural Associations

- To support organizing smallholders into agricultural associations
- To support organizing and capacity development of unions of agricultural associations
- To provide linkage of unions of agricultural associations with agricultural marketing companies
- To provide technological support to smallholders through agricultural associations

Support to Government Agencies

- To conduct capacity development of agricultural extension workers
- To support district-level agricultural government organizations

(2) Project Areas

- Northern Part of Niassa Province

(3) Supervising Agency at the National Level

- National Directorate for Promotion of Rural Development, Ministry of Planning and Development

(4) Implementing Agency at the Provincial and the District Levels

- Provincial Secretariat of Niassa
- Provincial Directorate of Agriculture
- Office for Strategic Studies and Development (GED) of Niassa Province
- District Government Offices and District Level Service Agencies of the selected districts

(5) Background Issues

- Little support by donor agencies for smallholder commercialization in northern part of Niassa Province, because of the conditions of accessing to markets.

(6) Input

Soft loan project for smallholder commercialization

- Consultant services for project management
- Consultant services for special activities
- Budget for construction, equipment and other services
- Budget for government activities

11.4 Study on Development Strategies for Agro-Processing Industry in Niassa Province

(1) Objectives

- To assess potential products and markets of agro-processing industry in Niassa Province
- To identify prospective investment projects (bankable projects) of agro-processing industry in Niassa Province
- To formulate strategies for promoting agro-processing industry in Niassa Province

(2) Study Area

- Niassa Province as a Whole

(3) Supervising Agency at the National Level

- Ministry of Industry and Trade

(4) Implementing Agency at the Provincial Level

- Provincial Secretariat of Niassa
- Provincial Directorate of Industry and Trade
- Provincial Directorate of Agriculture
- Office for Strategic Studies and Development (GED) of Niassa Province

(5) Background Issues

- Unstable supply of raw materials
- Little support to business development of private sectors

(6) Input

- Development Study by a consultant team

11.5 Study on District Development Planning and Management in Niassa Province

(1) Objectives

- To prepare database for district conditions (land conditions, natural resources, social and economic infrastructure)
- To prepare district development plans including land use plans
- To prepare implementation programs for district development
- To conduct capacity development for district development planning and management

(2) Study Areas

The study areas are part of Niassa Province, covering the following districts:

- Mecula District
- Lago District
- Ngauma District
- Marrupa District

(3) Supervising Agency at the National Level

- National Directorate for Promotion of Rural Development, Ministry of Planning and Development

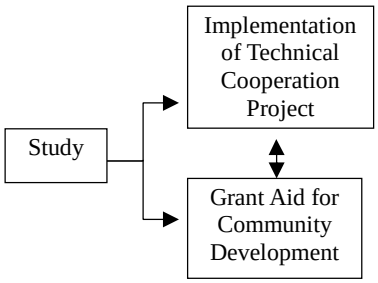
(4) Implementing Agency at the Provincial and the District Level

- Provincial Secretariat of Niassa
- Provincial Directorate of Planning and Finance of Niassa
- Office for Strategic Studies and Development (GED) of Niassa Province
- District Government Offices and District Level Service Agencies of the selected districts

(5) Background Issues

- District government's capacity of development planning and management
- Detailed Land Use Planning

- Village settlement patterns and village social infrastructure and services, such as road, water supply, school and health
- Small farmer commercialization
- Tourism development planning
- Small-scale industry such as agro-processing



(6) Input

- Development Study by a Consultant Team

(7) Further Assistance Necessary after this Study

It is desirable that this study on district development planning and management is to be followed by the following projects and programs:

- Technical Assistance Project for Further Capacity Building of District Governments
- Grant Aid for Construction of Primary Schools and Deep Wells for Community Development

11.6 Small Study on Tourism Development Strategies and Capacity Building in Niassa Province

(1) Objectives

- To prepare strategies for tourism development for Niassa Province
- To conduct capacity building for tourism development at the local level
- To establish Tourism Board participated in by public and private sectors

(2) Study Area

- Niassa Province as a Whole

(3) Supervising Agency at the National Level

- Ministry of Tourism

(4) Implementing Agency at the Provincial Level

- Provincial Secretariat of Niassa
- Provincial Directorate of Tourism
- Office for Strategic Studies and Development (GED) of Niassa Province

(5) Background Issues

- No clear strategies for tourism development in Niassa Province
- Little capacity of tourism services at the local level (hotels, restaurants, travel agencies, craft men) in Niassa Province
- Little support by government to local tourism business

- Little effort and initiatives at developing and promoting tourism attractions (both government and private sectors)

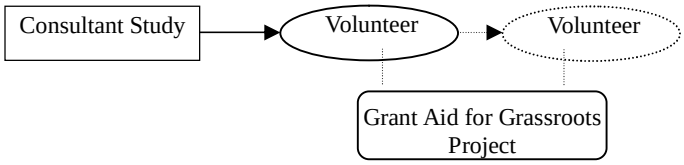
(6) Input

- Consultant (5 months in 1-year) on Tourism Development Strategies and Developing and Promoting Tourism Attraction

(7) Further Assistance Necessary after this Study

It is desirable that this study on tourism development strategies and capacity building in Niassa Province is followed by the following donor or NGO assistance:

- One Foreign Volunteer (2-year period)
- Grant Aid for Grassroots Project (information center, beautification and sign boards, pamphlets, etc.)



11.7 Study on Village Water Supply Planning and Management in Niassa Province

(1) Objectives

- To assess water source development including groundwater and surface water for village water supply and small-scale agricultural irrigation
- To prepare implementation plans for village water supply and small-scale agricultural irrigation
- To prepare strategies for borehole and pump maintenance
- To prepare strategies of organizing community-based user groups for borehole and pump maintenance
- To prepare strategies of capacity development of district-level caretakers of village boreholes and pumps
- To prepare strategies to develop locally-based small entrepreneurs for borehole and pump maintenance
- To conduct pilot projects for implementing these strategies

(2) Study Area

- Three districts (which are not covered by Water Aid projects)

(3) Supervising Agency at the National Level

- National Directorate of Water, Ministry of Public Works and Housing

(4) Implementing Agency at the Provincial and the District Levels

- Provincial Secretariat of Niassa
- Office for Strategic Studies and Development (GED) of Niassa Province
- Provincial Directorate of Public Works and Housing
- Provincial Directorate of Agriculture
- District Government Offices and District Level Service Agencies of the selected districts

(5) Background Issues

- Difficulty in supplying water to population sparsely living in rural areas
- Difficulty in maintaining boreholes and pumps by local people

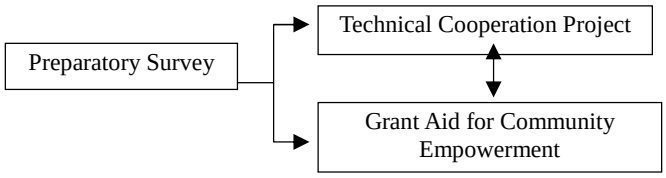
(6) Input

- Preparatory Survey for planning for donor assistance by a consultant team

(7) Further Assistance Necessary after this study

It is desirable that this Study is to be followed by the following foreign assistances:

- Technical Cooperation Project for Village Borehole and Pump Maintenance
- Grant Aid for Community Empowerment for Development Deep Wells and Other Water Sources



11.8 Study on City Planning of Cuamba, Mandimba and Lichinga in Niassa Province

(1) Objectives

City planning in Cuamba

- To incorporate a bypass in the Cuamba City Structure Plan
- To prepare strategic city development programs
- To prepare a plan for truck parking areas along a prospective bypass
- To prepare a plan for industrial estates along a prospective bypass

City planning in Mandimba

- To prepare a guideline for city planning for Mandimba town

City planning in Lichinga Municipality

- To give advice for preparing a base map for city planning
- To give advice for preparing a Structure Plan (including a land use plan) for Lichinga Municipality
- To give advice for preparing a beautification plan for the city center
- To give advice for preparing strategic city development programs

(2) Study Area

- Cuamba Municipality, Mandimba Town and Lichinga Municipality

(3) Supervising Agency at the National Level

- Ministry of Planning and Development or Ministry of Public Works and Housing

(4) Implementing Agency at the Provincial and the District Levels

- Provincial Secretariat of Niassa
- Office for Strategic Studies and Development (GED) of Niassa Province
- Cuamba Municipality, Mandimba District and Lichinga Municipality,

(5) Background Issues

- How to secure the land for Cuamba Bypass and how to prepare the land with infrastructure for future industrial development
- How to prepare for future expansion of urban area for Mandimba Town
- No Structure Plan for Lichinga Municipality

(6) Input

- Development Study Type of Donor Assistance

11.9 Study on Geological Models for Mineral Resources Exploration in North-western Part of Niassa Province

(1) Objectives

- To conduct a study on geological models related to mineral resources
- To provide scientific information on geological models related to mineral resources to investors

(2) Study Area

- Northwestern Part of Niassa Province

(3) Supervising Agency at the National Level

- Ministry of Mining, National Directorate of Geology

(4) Input

- Development Study by a consultant team

Chapter 12 Impact of the Trunk Road Improvement in Nacala Development Corridor on Regional Development

12.1 Introduction

This chapter describes how the trunk road improvement between Cuamba and Mandimba in Nacala Development Corridor makes impact upon the regional development, and what development potentials are realized in the conditions created by the road improvement.

Generally, the trunk road improvements bring direct and indirect benefits as follows:

Direct benefits

Direct benefits of road improvement are measured by the benefits of saving transport time of road users and vehicle operation costs. The road improvement provides the condition to bring those two benefits.

Road improvement creates opportunities to utilize various development potentials of the region. As a result, economic activities are activated gradually. When economic activities are activated, road users and vehicles would increase. Therefore, the total benefits of saving transport time and vehicle operation cost would increase.

Indirect benefits

The road improvement would bring indirect benefits to the regional development.

The possible measures, and the priority projects and programs described in the above chapters can be feasible only when completing the trunk road improvement. If the projects are implemented, further benefits will be brought to the region. However, if the projects are not implemented, the utilization of development potentials and realization of development benefits would delay.

The direct benefits are analyzed in the Part IV Economic Feasibility Study. The analysis was made based on the traffic demand forecasts, using the future indicators projected in the Strategic Plan of Niassa Province (PEP Niassa 2017). The future indicators in the PEP were set in consideration of the conditions achieved not only by the trunk road improvement along the Nacala Corridor, but also by the improvement of the road between Mandimba and Lichinga, and by implementation of various projects including those proposed in Chapter 10.

12.2 Impact of the Road Improvement on Regional Development

The indirect benefits of the trunk road improvement in Nacala Development Corridor from broad view points are described below.

(1) Corridor along Cuamba-Mandimba Trunk Road: Southern Part of Niassa Province

Smallholder Agriculture and Agro-Processing Industries:

The upgrading and pavement project of Cuamba-Mandimba Road could reduce transport costs, as well as improve road access along the corridor. As a result, regional potential to commercialize smallholder agriculture and to expand smallholder production would be enhanced. However, such road upgrading alone cannot realize the enhanced regional potential and achieve smallholder commercialization and production expansion. Therefore, it is necessary to assist in strengthening smallholder agriculture associations and securing market channels for their produce.

The upgrading and integration of Cuamba-Mandimba Road with already upgraded Nampula-Cuamba Road would substantially reduce long-distance transport costs by truck so as to reduce goods prices to be imported from other regions.

It is considered that such smallholder commercialization and agricultural production expansion would increase business potential of agro-processing industries along the corridor. However, such road upgrading alone is not enough to exploit improved opportunities in agro-processing industries. It is essential to assist in not only feasibility studies but also business development services, for providing information and support to private sectors. Such measures would help private sectors to actually invest in the field of agro-processing.

Urban Economy and Logistics Function

The integrated upgrading of trunk roads of Nacala Development Corridor would vitalize regional economy along the corridor. This could promote geographical expansion of commercial catchments Nampula Town and Nacala Town, resulting in upgraded commercial agglomeration.

Similarly the inland towns, such as Cuamba Town and Mandimba Town, would expand their commercial catchments and increase demands for transport and logistics sectors.

In addition to the upgrading of Nampula-Cuamba-Mandimba Road, development of bypass roads, logistics centers and loading-unloading facilities between roads and railways would be necessary for making regional transport more effective and efficient by taking advantage of upgraded trunk roads and rehabilitated railway of Nacala Development Corridor.

(2) Periphery of Nacala Development Corridor: Central and Northern Parts of Niassa Province

Smallholder Commercialization and Production Improvement

Commercialization of smallholders in the periphery of Nacala development Corridor would be encouraged by the road improvement between Nampula, Cuamba and Mandimba. Due to the reduced long-distance transport costs, the

farmers would be able to sell their agricultural products at higher prices. As the economic activities in Nacala Development Corridor are vitalized with the trunk road improvement, populations of Cuamba Town and Mandimba Town would increase. As a result, the amount of agricultural products to be dealt with by the middlemen would increase. Currently the support to smallholder commercialization by organizing agricultural associations and by making linkage with marketing companies is provided in a limited number of villages in the southern part of the province. In order to make full use of the enhanced opportunities for smallholder commercialization, such support should be expanded to the central and northern parts. In addition, agricultural technical support should be introduced to improve their production.

Tourism Development

If the road between Nampula, Cuamba and Mandimba is improved, tourists visiting southern part of the Province from Malawi or Nampula by bus or car would increase. It is expected that Lichinga would be developed as a comfortable tourist base to provide accommodation to tourists, traveling along the route via Cuamba and Mandimba. Measures should be taken to improve the quality of tourism services in hotels, restaurants and car rentals, as well as to provide tourist information in Lichinga Town. Furthermore, efforts should be made to attract tourists to make trips from Lichinga to nearby tourist spots such as Niassa Lake and nature conservation areas.

In order to fully develop tourism in Niassa Province to such an extent that more international and domestic tourists would visit Niassa Lake and/or Niassa Reserve as popular tourist destinations, good access conditions should be ensured with improved Mandimba-Lichinga Road. In combination with the road improvement, it is necessary to make Lichinga Town an attractive tourist center, by providing small tourist-oriented facilities, such as tourist information centers, museums and sign boards. It is also necessary to start developing the capacity of local tourist industries by providing training programs. More tourist accommodations and attractions should be developed at Niassa Lake and Niassa Reserve. For facilitating tourism development at the provincial level and for promoting tourism in Niassa Province, it is also recommended to establish a local tourism board involving government and private sectors.

Development of Wood Processing Industry

Improvement of Mandimba-Lichinga Road is essential for promoting industrial development, such as wood-processing industries, in the central and northern part of Niassa Province. The road improvement would largely contribute to cost reduction of long-distance truck transport and furthermore to price reduction of imported goods, such as spare parts and fuels. This could lead to enhancement of basic conditions for attracting industries.

For actual promotion of wood-processing industries, business development services should be provided for foreign investors and companies. Furthermore, it is also necessary to develop small and medium scale enterprises (SMEs) of wood-processing for local employment generation.

Mineral Resources Development

The improvement of Lichinga-Mandimba Road is essential to realize mineral resources development in the north-western area of the province. Together with the road improvement, geological surveys and research are important to provide information on mineral resources availability to promote private investment in mineral exploration and furthermore in mineral exploitation. In the long term, rehabilitation of Lichinga-Cuamba Railway Line is highly expected for transporting exploited mineral resources through Cuamba, Nampula and Nacala.

Improvement of Social Services

In addition to the above-mentioned economic development measures, the improvement of social services, such as water, education and health, as well as the improvement of local roads are very important for the regional development in the central and northern parts of Niassa Province. In the decentralization policy of Mozambique, budgets for the development are allocated to district governments, and they are supposed to play central roles in planning and implementation for local development. However, their capacity is limited. In order to improve social infrastructure and services, assistance programs for capacity development of district governments are necessary.

Appendices

Appendix-A
Potential and Constraints of Niassa Province Identified in PEP Niassa 2017

Appendix A Potential and Constraints of Niassa Province Identified in PEP Niassa 2017

A.1 Summary of Development Issues taken from PEP Niassa 2017

The 10-year Strategic Plan of Niassa Province (PEP Niassa 2017) provides a good summary of development issues in the form of SWOT analyses of the following six (6) areas:

- Infrastructure
- Natural Resources
- Regional Integration
- Human Resources
- Culture and Sports
- Governance

Please see Tables A.1.1 through A.1.6.

Table A.1.1 SWOT Analysis of Infrastructure by PEP Niassa 2017

Strength	Weakness
- Extension to the province of electrical energy from Cahora Bassa - Existence of a network of roads that unify the three poles of the province's development triangle: Lichinga-Cuamba-Marrupa - Existence of a project to expand the electrical energy network to more districts, passing through the unification of the three development poles	- Insufficiency of investment resources - Poor functioning of the Cuamba-Lichinga railway - Failure to asphalt the Lichinga-Cuamba road - Limited airport infrastructure in Lichinga Airport
Opportunities	**Threats**
- Commercial and physical integration of the province within the northern region of the country - Commercial integration with Malawi and Tanzania - Potential economic growth in Niassa (agricultural projects, e.g. ethanol, mineral resources, forestry industry) - Integration of Nacala Development Corridor and Mtwara Development Corridor - Existence of a project to construct bridges over Rovuma River - Existence of Niassa Reserve	- Existence of higher return projects in other provinces - Slowdown of economic growth rates in Niassa - Frustrated expectations for large investors/ large investment projects

Source: PEP Niassa 2017 (2008)

Table A.1.2 SWOT Analysis of Natural Resources by PEP Niassa 2017

Strength	Weakness
- Existence of a zoning study for natural resources - Existence of virgin natural habitats, a diversity of fauna and flora, diverse and gorgeous landscapes, mountains with spectacular views, rivers with a large, permanent flow - Low population density above all in the areas suitable for tourism development	- Insufficiency of infrastructures and support services
Opportunities	**Threats**
- Areas with flora and fauna that are not degraded: the dimension of the virgin territory in Niassa has few competitors in the world - Existence of management project for natural resources organized by the communities in partnership with the private sector (the Chipanje Chetu Program [PCC] and Manda Wilderness)	- Possibility of the emergence of conflicts between concessionaires and communities - Nomadism as a result of shifting agriculture - Uncontrolled bush burning

Source: PEP Niassa 2017 (2008)

Table A.1.3 SWOT Analysis of Regional Integration by PEP Niassa 2017

Strength	Weakness
- Fertile land and favorable climate - Abundance, quality and diversity of natural resources - Low cost of labor - Long frontiers with neighboring countries - Inclusion of the province under the scheme for Rapid Development Zone	- Weak technological development - Scarcity of investment capital - More developed frontier areas - Precarious infrastructure
Opportunities	**Threats**
- Expansion of markets - Specialization on the basis of comparative advantages - Attraction of more investments - Neighbor to rapidly growing provinces	- Greater competitiveness of imported products - Greater competitiveness by neighboring provinces in attracting investments

Source: PEP Niassa 2017 (2008)

Table A.1.4 SWOT Analysis of Human Resources by PEP Niassa 2017

Strength	Weakness
- Improvement and expansion of basic services - Training and capacity building of human resources in social service sectors - Implementation of programs of literacy and adult education - Existence of training centers for self-employment	- Inadequate facilities for health units and schools, including higher education, principally in peripheral areas - Poor coverage by networks of schools, health facilities and water supply - Low availability of qualified human resources
Opportunities	**Threats**
- Establishment of synergies between traditional and modern medicine - Expansion of health networks - Appearance of more NGOs and community organizations for health care - Existence of centers to train health and educational personnel - Increase of resources for social services - Possibility of using cheap alternative technologies for housing construction	- Growth of transmittable diseases (HIV/AIDS) - High rate of illiteracy - Dispersed distribution of population, which hampers social programs for helping people - Appearance of new endemic diseases - High costs of construction material - Premature marriage and passage as adults by girls - Low education levels of girls

Source: PEP Niassa 2017 (2008)

Table A.1.5 SWOT Analysis of Culture and Sports by PEP Niassa 2017

Strength	Weakness
- Optimal altitude for practicing athletic sports - Existence of an unique ethno-cultural mosaic - Existence of historical and cultural locations	- Low availability of sports and cultural infrastructures - Poor signage, preservation and identification of historical sites - Lack of basic support services for development of culture and sports
Opportunities	**Threats**
- Growth of resources for the creation of areas for conservation, preservation and tourist attractions	- Deficient priority given to investments for culture and sports - Uncontrolled bush fires - Cultural clashes, e.g., initiation rites versus school calendar

Source: PEP Niassa 2017 (2008)

Table A.1.6 SWOT Analysis of Governance by PEP Niassa 2017

Strength	Weakness
- Public Sector Reform Program and Provincial Reform Plan are in process - Gradual improvement of public services - Gradual increase in fiscal receipts - Establishment and professionalization of the province One-Stop-Shop - Existence of District Development Plans and consolidation of the Planning Systems - Establishment of Community Consultative Councils - Establishment of Councils for Community Police - Expansion of the services for administration of justice in districts - Existence of Malonda Foundation, an institution for promotion and support of private sector development - Existence of Business Center in Niassa, Nakosso for the establishment of favorable business environment	- Deficient process of decentralization - Deficient provision of public services - Non-existence of mechanisms for control and evaluation of performance of public servants - Deficient mechanisms for monitoring and evaluation - Lack of motivation of public servants and, consequently, high absenteeism in fulfilling their obligations - Prevalence of inequality - Absence of practice to make public servants responsible - Weak development of civil society and dependence on external and central government finance - Deficient coordination between the government and civil society organization in development activities - Weak development of private sector
Opportunities	**Threats**
- Reform programs and policies in process in the country - Creation of provincial assemblies - Creation of institutions to support the reforms (BAU, Provincial Secretariat, Nakosso, Malonda Foundation, the Cabinet of Strategic Studies) - Growing public and private investment - Establishment of partnerships between the public and private sectors and civil society	- Failure to satisfy the requirements of various emerging organizations in the private sector and civil society - Conflicts between sectors (private, society and state) - Lack of coordination between the public and private sectors and civil society - Inadequate legal framework - Fall in public and private investment - Absenteeism and indifference - Disparity among districts - Ethnic and tribal conflicts - Prevalence and growth of HIV/AIDS

Source: PEP Niassa 2017 (2008)

Appendix-B

Village Conditions in Niassa Province

Appendix B Village Conditions in Niassa Province

B.1 Village Survey

In this planning study, two expatriate experts of regional and rural development conducted a small village survey together with a local survey assistant. This village survey was based on two types of structured questionnaires designed for key informants and for households. This survey covered 11 villages and 23 households in four districts. The sample numbers of villages and households are small. However, more emphasis was put on qualitative aspects of village life and livelihood. The direct observation in the course of visiting, surveying and staying in villages and talking to local people was very useful for the two expatriate experts to understand village life and livelihood.

B.2 Findings from Village Survey

(1) Few local farmers hire trucks or ride shapa (minibus) for transporting their agricultural produce to market places. Usually they bring a small amount of produce by bicycle to buying points, they wait for middlemen coming to their villages, or they sell to their neighbors in villages. In the case of cotton and tobacco, buying companies come to villages to buy produce.

(2) In their villages and neighboring villages, there is almost no one who owns/ operates trucks or shapa. In the surveyed 11 villages, only one villager has a motor vehicle. Therefore, villagers do not rent trucks or minibuses for transporting and selling their produce.

(3) Bicycles are the most important transport modes for villagers. 20 households out of 23 surveyed households have one to three bicycles.

(4) The number of primary schools has increased by establishing new schools in villages. However, those new schools do not always have classes up to 7th grade. The expectation of villagers to school education is generally high.

(5) Many villages do not have any pumped wells (deep boreholes). In the surveyed 11 villages, only four villages have pumped wells. In those which do not have deep wells, villagers use shallow wells and rivers. Shallow wells cannot be used in the dry season, and they have to rely on rivers, which are far from village settlements in many cases.

(6) Cultivated lands are not so large. More than half (13 households) of the surveyed 23 households cultivate lands less than 3 ha.

(7) There is a clear difference in expenditure amount and pattern between rich months and poor months in a year. See Table B.2.1.

Table B.2.1 Expenditure Pattern of Rich Month and Poor Month

Rich Month	
Monthly Expenditure	No. of Households
Less than 500Mt	7
500～1,000 Mt	4
1,000～1,500 Mt	1
1,500～2,000 Mt	5
2,000～2,500 Mt	1
2,500～3,000 Mt	2
More than 3,000 Mt	3
Total No. of Households Surveyed	23

Poor Month	
Monthly Expenditure	No. of Households
Less than 100Mt	7
100～200 Mt	3
200～400 Mt	2
400～600 Mt	3
600～800 Mt	5
800～1,000 Mt	1
More than 1,000 Mt	2
Total No. of Households Surveyed	23

Source: Small Village Survey conducted by the JICA Study Team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