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Managerial decisions with computers in national directorate of the merchant marine in Mozambique

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MANAGERIAL DECISIONS WITH COMPUTERS IN NATIONAL DIRECTORATE OF THE MERCHANT MARINE IN MOZAMBIQUE

by

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MOZAMBIQUE

A paper submitted to the Faculty of the World Maritime University in partial satisfaction of the requirements for the award of a

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IN

GENERAL MARITIME ADMINISTRATION

The contents of this paper reflect my personal views and are not necessarily endorsed by the University.

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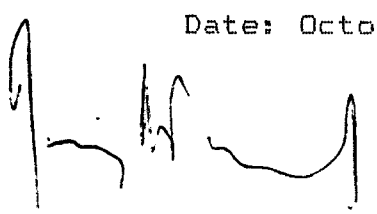

TO DALYA AND LITO

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INTRODUCTION

The People's Republic of Mozambique is a coastal state, situated in one of the main international routes- Mozambique canal. Because of that, it has specific responsibilities in the control of its territorial waters and safety of life at sea.

Within the region, Mozambique is member a of SADCC (Southern African Development Co-ordination Conference) and is responsible for the co-ordination of the transport system.

Since independence many efforts have been made in the country to re-organize the maritime transport.

Recently, the National Directorate of the Merchant Marine and Maritime Administration (NDMM) was created. However the process of creating and defining the structures of the NDMM is not yet complte. From its preamble, it can be noticed that further suggestions and comments are still required.

Therefore, the main objective of this thesis is to discuss and present suggestions for introducing the computers in the National Directorate of the Merchant Marine with the aim of improving the decision-making of the managers.

This thesis does not have the intention of putting the actual organization and structures in doubt. Neither, does it change the channels of decision-implementation. The NDMM was created in 1988. While the author was in Malmo attending General Maritime Administration course. Therefore it is too soon to say that its structures does not function. However with the experience acquired in the World Maritime University and taking into account the Mozambican reality the author believes that gradually

it will be possible to improve the information system in the National Directorate of the Merchant Marine through the use of computers.

This thesis is divided into five chapters:

- the fist chapter presents the country and highlighting transport and communications;

- the second chapter deals with the present organization, structure and existing information system in the NDMM;

- the third chapter presents what can be done to the new system;

- the fourth chapter presents the possible structure to adopt in the future;

- the last one deals with conclusions and general remarks.

I.2 GENERAL PRINCIPLES OF THE CONSTITUTION

The Constitution came into force at Independence on 25 June 1975. The P. R. of Mozambique is a sovereign, independent and democratic state. Power belongs to the workers and peasants united and led by Frelimo, and is exercised by the organs of people's power. Frelimo is the leading force of the state and society. The republic has the following fundamental objectives:

- The elimination of colonial and traditional structures;
- The extension of people's democratic power;
- The building of an independent economy;
- The defense and consolidation of national independence and unity.

Private and personal properties are guaranteed and foreign capital is authorized to operate within the framework of the state's economic policy. The republic is a secular state in which there is absolute separation between the state and religious institutions.

I.3 ECONOMIC AFFAIRS

The economy is based on agriculture, which employed about 83% of the labour force mainly in subsistence forming, in 1988. The major cash crops are cashew nuts, sugar cane, cotton, tea and sisal. Maize, bananas, rice and coconuts are grown as well.

Since Mozambique achieved independence in 1975, agricultural production has been hampered by a lack of skilled manpower, adverse weather conditions, and persistent security problems. Since 1976, more than 1,500 communal villages have been established, and state farms

set up, in the effort to "socialize" the rural sector.

By 1980, 165 agricultural co-operatives had also been established, and in 1985 it was estimated that the state and co-operative sectors together accounted for about 40% of the marketed agricultural production. However, a number of state farms proved to be uneconomic, and were divided into individual peasant holdings from 1980 onwards. Since 1983 the government has attempted to give increased priority to improving production from small farms in the family sector. In June 1986 the government extended the leasehold period for occupation and use of land from between 5 and 15 to 50 years.

The relaxation of price controls for several agricultural products in 1987 increased agricultural output.

A prolonged and severe drought in parts of the country has had an increasingly damaging effect on crop production since 1981, and further problems were caused by floods and cyclones in 1984, and by bandits.

The total production of cashew nuts fell from 80,000 metric tons in 1975 to an estimated 25,000 tons in 1985, but rose to about 30,000 tons in 1986.The output of sugar has also been affected; production of raw sugar reached about 17,000 metric tons in 1985, compared with a record pre-independence level of 350,000 tons per year.

There are considerable mineral resources, although only coal, diamonds and bauxite are currently exploited. IN 1980 the mining sector was severely disrupted by internal unrest, and suffered from fluctuations in world mineral prices; earnings from mineral exports fell from 200 M.Meticais* in 1981 to 10 M.Meticais in 1986.

Metical,plural Meticais=currency of Mozambique.

Mozambique has proven coal reserves of some 1,000 m tons, but production, at Moatize, in the Tete Province, has been constrained by security and technical problems.

Manufacturing is limited in scale, and Mozambique is heavily dependent on South African industrial products. Food processing forms the bases of this sector, with sugar refining, cashew and wheat-processing predominating. Other industries include cotton spinning and weaving, brewing and the manufacture of cement, fertilizers and agricultural implements. Mining and heavy industry have the potential for major development, aided by the construction of a national electricity grid, using power from the hydroelectric plant at the Cabora Bassa Dam.

In order to brake the decrease in the economy, in January 1987 the Government began implementation of a recovery programme for 1987-90 (PRE), upon which assistance from IMF was conditional.

Under the programme, the Country's Gross Domestic Product (GDP) was to grow by 3.5% in 1988 and by 5% in 1990, compared with 0.5% in 1986.

The programme aimed to increase productivity and exports, policy changes intrinsic to the programme, such as the devaluation of the Metical, relaxation of price controls and encouragement of private investment, reflected further movement by the Government towards the liberalization of the economy.

During the period 1980-85 Mozambique's gross domestic product was estimated to have declined by 9.6% per year, in real terms, owing to adverse weather conditions, the security situation and a lack of foreign exchange. In 1986 although the country continued to experience considerable difficulties, the decline in GNP slowed as a result of government policies and support from aid-donors. In 1987 a growth of 4% in GNP was achieved, owing largely to the

implementation of austerity measures under the 1987-90 economic recovery programme,and because of the subsequent increase in international financial support.

BALANCE OF PAYMENTS (US$ MILLION)

	1984	1985	1986
Merchandise exports.f.o.b	97.7	76.6	79.1
Merchandise imports c.i.f	-539.7	-423.8	-542.7
Trade balance	-444.0	-423.8	-463.6
Services and transf.(net)	-	60.2	82.0
Current balance	-308.3	-286.9	-381.6
Capital Balance	-73.0	-39.7	-87.6
Net errors and omissions	23.2	-2.9	-73.0
Total (net monetary movements)	-358.1	-329.6	-542.2

I.4 EDUCATION

At Independence, between 85%-95% of the adult population were illiterate. By 1985, according to estimates by UNESCO, the proportion was 62% (males 45.2% females 77.9%).

There is a major emphasis on campaigns for adult literacy and other adult education with about 550,000 people attending classes in 1981, as well as on widening the scope of primary and secondary schooling.

Education is officially compulsory for seven years from the age of six.

The number of children receiving primary education increased from 634,000 in 1973 to 1,495,000 in 1979, but declined to 1,251,391 in 1986. The total enrollment at primary and secondary schools of children in appropriate age-groups rose from 30% in 1972 to 52% in 1979, but fell to 37% in 1983.

The National Education System was approved in 1982 and began to be introduced in 1983. The State plan for 1983-85 forecast that 722,900 new pupils would be admitted to general education, 6,100 to technical education, and that literacy classes would admit 229,000 adults.

There is a university at Maputo (Universidade Eduardo Mondlane) and there were some 2,500 students at the University in 1988.

I.5 TRANSPORTS AND COMMUNICATIONS

Mozambique's transport system is oriented to supply commodities to land-locked southern countries.

The "Beira Corridor" where rail and road links and a petroleum pipeline run along the Zimbabwe border and the Mozambican port of Beira, provides a vital outlet for the land-locked Southern African countries, particularly Zimbabwe and the development of this rout as an alternative to the trade routes through South Africa, is a major priority for the Southern African Development Co-ordination Conference, SADCC.1

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1 For more information see appendix 1, The SADCC Ports hand book, an African publication by Collen Lowe Morna

I.5.1. RAILWAYS

The total length of track is 3,843 km, excluding the Sena sugar state railway (90 km), which serves only the company's properties. The railways are now all state-owned. There are rail links between Mozambican ports and South Africa, Zimbabwe, Malawi and Swaziland, together with internal routes.

Improvements to most of the principal railway lines began in the early 1980's, including the rehabilitation of the Machipanda-Beira rail link between Zimbabwe and Beira Port.

In 1987 major rehabilitation projects were also being undertaken on rail links between Chicualacuala, at the Zimbabwe border, and the Port of Maputo (534 km), and between the Port of Nacala and Blantyre in Malawi.

Railways (traffic)

	1984	1985	1986
Freight Carried('000 metric tons)	3,698.6	2,899.5	2,949.3
Freight ton-km (million)	536.3	289.6	303.3
Passengers carried ('000)	5,296.0	6,723.0	6,619.0
Passengers-km (million)	284.1	225.4	263.6

I.5.2. ROADS

In 1974 there were 39,173 km of roads in Mozambique, of which 11,905 km were classified as first-class roads, and 14,715 km as second class roads. In 1985 a major programme, supervised by the SADCC, was under way to

improve the road links between Mozambique and neighboring countries. Efforts are also being made to improve north-south road connections and to construct rural feeder road systems in each province.

I.5.3 CIVIL AVIATION

There are 16 airports, of which three are international airports.

Civil Aviation	1984	1985	1986
Freight Carried ('000 metric tons).....	6.5	7.0	6.8
Passengers carried ('000).....	341.2	229.7	257.3
Passengers-km (million).....	621.1	486.2	504.9

I.5.4 SHIPPING

The national fleet of Mozambique consists of different type and size of vessels.

From the registration records, the exact size of the fleet can not be visualized. It is usual to say that it is about 30,000 GRT but this figure perhaps includes small boats and barges, owned by individuals sailors; however, the fleet plays a great role in the overall transport system.

As shipping companies, there are two state owned companies in Mozambique.

- NAVIQUE, E.E.
- NAVINTER, E.E.

The first one commenced its activities in May 1980.

In January 1988 the Navique's fleet was as it can be observed on the next page.

From time to time, Navique has principally acquired ships mainly to renew its fleet and to operate also some chartered vessels as well. Nowadays 11 dry cargo vessels and 3 tankers are in operation. Nine of the dry cargo vessels are owned by Navique and 2 chartered (time charter).

The fleet is far from tailor-made for Mozambique's coastal operations. Previous lack of maintenance and spare parts, and also the present shortage of proper repair facilities make it necessary to use large amounts of funds and time to enable the vessels to operate.

NAVIQUE'S FLEET IN JANUARY 1988

Ship's Name	Type of cargo	Year of built	DW	GRT
Inharrime	Container	1974	2,150	2,950
Linde	G.Cargo	1973	2,600	2,794
Lugela	Container	1974	2,150	2,950
Luabo	Petroleum	1973	1,000	2,286
Macuze	Petroleum	1946	320	400
Muanza	G.Cargo	1967	1.000	2,270
Nguri	G.Cargo	1977	1,150	2,286
Polana	G.Cargo	1967	2,300	2,890
Save	G.Cargo	1970	1,250	2,800
TOTAL			13,920	21,626

CHAPTER II

PRESENT STATE IN THE MARITIME ADMINISTRATION

In order to understand the problems of the Maritime Administration in Mozambique it is important to have a look at how it has developed since independence.

The developments and difficulties, are part of the difficulties which the country is facing.The ministry in charge of Marine Affairs,has changed the name several times and the organization and structure has changed as well.

At independence that ministry was called Ministry of Transport and Communications. The Minister was responsible for:

- Road transport
- Air transport
- Sea transport
- Railways
- Telecommunications.

The Maritime Administration, was led by "Co-ordinate Commission of Maritime Transport" (see Annex 1).

IN 1980 the ministry changed to the "Ministry of Ports and Surface Transports". This alteration means that, the ministry was divided into two ministries. The other ministry was called "Ministry of Telecommunication and Civil Aviation". The ministry was made up by three national directorates:

- .National Directorate for Ports and Railways,
- .National Directorate of Shipping and Inland

Waterway Transports,

.National Directorate of Road Transport (see annex 2).

By 1984 the ministry changed again the name to "Ministry of Ports, Railways and Merchant Marine". The structure can be seen in annex 3.

At this stage the Maritime Administration was observed as an important sector in the context of strategy development of the country in general.

One Vice-Minister was appointed to deal with the Merchant Marine. All the sectors were re-organized.

In 1986, the ministry changed to the Ministry of Transports and Communications. The same name which it had at the time of the Independence. The ministry is headed by a Minister and two Vice-Ministers. One of them is responsible for the Merchant Marine and other to telecommunication and Civil Aviation.

All those alterations contributed to misunderstandings of the role of marine affairs. "... In every developing country there is usually a Ministry that is expected to be responsible for maritime matters. However, in most developing countries maritime matters (shipping) have not had the priorities that they deserve and the concerned Ministries have also to deal with many other non-marine matters affect the common man on day-to-day basis. For example, it is found to be practice in many developing countries to make a Ministry responsible for transport and/or communications to be resoonsible for maritime matters. In such cases, the Minister is naturally pre-occupied with matters pertaining to road transports and telephone / wireless services".1

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1 P.S.Vanchiswar, Establishement/Administ. Mart. Affairs.

In July 1988, the National Directorate of the merchant Marine was created. It can be seen in its fundamental document:

The National Directorate of the Merchant Marine, is a state instrument which directs, plans, co-ordinates and controls within the scope of the Ministry of Transports and Communication :

A) The maritime transport activities through the sector's enterprises;
B) The maritime administration activities as well as the application of maritime safety regulations.

II.1.1. OBJECTIVES OF THE NATIONAL DIRECTORATE OF THE MERCHANT MARINE

The objectives of NDM are:

- To promote the safety of navigation and the life at sea;
- To promote the preservation of the marine environment and to control marine pollution;
- To establish principles and strategies of maritime transport and to fix the prices to be applied by the services in its dependence;
- To co-ordinate the activities of maritime administrations;
- To establish the planning strategy as well the development projects of the sector;
- To establish the strategy for training of marine personnel;
- To represent the country in international meetings related to the merchant marine;

- To promote and estimate the investigations and studies of nautical science and the development of maritime transport
- To participate and stimulate the practice of nautical sports;
- To establish and control, the quantity and quality of safety standards of embarkations,
- To control the communications ship/shore and vice-versa in order to protect the human life at sea.
- To watch over the devaluation and accomplishment in the country, the maritime legislation and international conventions
- To inspect; in particular the Maritime Administrations and other subordinate organs in order to have uniformity in procedures.

II.1.2. STRUCTURE OF THE NATIONAL DIRECTORATE OF THE MERCHANT MARINE

The structure of the National Directorate of the merchant Marine is made up by the following organs:

- Department of Maritime Safety Administration
- Department of Commercial Navigation
- Department of Naval Material and the following staff organs:
  - Department of Administration and Finance
  - Department of Planning
  - Department of Personnel
    - Secretariat of the Directorate. See annex 4.

All the main departments are directed by a Chief of Department and are subordinated to the National Director of the Merchant Marine.

The Department of Maritime Safety Administration is constituted by the following services:

. Maritime Registration

. Maritime Safety

. Inspection, Search and Rescue.

The Department of Commercial Navigation is made up of the following services:

. Maritime Trade

. Costs and Freight.

The main tasks of this department are:

A) To elaborate économic studies and terms of reference related to water transport;

B) To control operation management of shipping companies in order to guarantee their profitability;

C) To propose the tariff policy and measurements related to freight for all shippers;

D) To analyse and propose licensing related to transportation of passengers and cargo by individual entities;

E) To make proposals of the number and kind of vessels to operate in each zone of the country;

F) To analyse and make proposals about sales and purchase of vessels;

G) To propose the commercial policy to be followed by shipping companies in cabotage transport.

The Department of Naval Materials has the following functions:

- To organize and up-date the dossier of the National Merchant Fleet;
- To maintain technical assistance.

The National Directorate of the Merchant Marine is led by a national director and assisted by two deputy directors. The national director and the deputy directors are aopointed bv the Minister of Transport and Communications.

.The national director of the merchant marine is responsible for the correct functioning of the sector and for the accomplishment of the tasks attributed to the National Directorate of the Merchant Marine.

In particular it is within its scope to:

A) Lead the activities of National Directorate;

B) Guarantee the functional link between organs of the Ministry of Transport and Communications;

C) Assist the Minister of Transport in defining and elaborating development and growth of the Merchant Marine;

D) Assure the implementation of Government decisions related to the sector;

E) Assure that the development of the sector is made without distortion, taking into account the interest of the national economy;

F) Lead and co-ordinate the activities of Maritime Administrations;

G) Sign the international certificates of safety of ships;

H) Represents the National Directorate in meetings and contracts which is membwr;

I) Submit proposals of legislation related to maritime trade, maritime safety,the protection of marine environment,marine personnel and others matters related to administration and labour;

J) Promote action in order to protect the marine environment;

K) Take action in order to avoid marine pollution;

L) Lead the action of inspecting of ships.

II.1.3 FUNCTIONING

The National Directorate of the Merchant Marine, to exercise the task in their scope, is assisted by the Council.

The Council assists the NDMM mainly in matters related to control and planning of activities in the sector; in definition and application of development policies, human resources and implementation of the state policy.

The Council meets once a month and is made up of:

- a national director,
- national deputy directors,
- chiefs of departments.

There is also a general council with the objective to analyse and take decisions related to activities made during the year and to make proposals concerning the future.

The General Council meets once a year and is composed by

- the members of the Council,
- the director of the Nautical School,
- the director of national Institute of Hydrography,
- directors of state owned shipping companies,
- maritime administrators,
- others responsible to be appointed by the National Director.

II.2. EXISTING INFORMATION SYSTEM

As it can be observed below, the existing information system is not computerized and the way in which it circulates is not correct.

The base of decisions are the meetings. In all meetings it is common practice to write a report. Problems of all sectors are discussed in those meetings. Information circulates from one sector to another and the people responsible of departments or services have to report the status of their sectors and the solutions taken in each situation.

Indeed the personal experience of the author shows that managers in general, often spend as much as half of their working time in such direct communications

activities such as meetings, writing, reading, telephoning and searching for information.

However, nowadays making decisions with computers is truly the art of the managers manly in shipping industry. The manager is not a worker with information, but a user of information. Success in this depends upon the ability to get the information needed the ability to interpret that information and to communicate the decisions taken.

There is in the Ministry one center of documentation. However this center is not computerized and it concentrates all the documents and publications related to transport and communications. The problem is, how the managers use that information, who make the necessary interpretation and how it circulates from the base to the top level and vice-versa.

The author observed also the lack of experience in the process of collecting and organizing information. Owing to such a situation, it is very difficult to have the required information when needed. As it can be observed in parts II.1.1 and II.1.2 of this thesis. The National Directorate of Merchant Marine controls almost everything related to maritime transport. Using only the system of meetings and discussions it is not possible to take decisions and implement them on time.

Mozambique has a coastline of about 2,470 km from Palma to Ponta de Ouro. Information from Palma to Maputo (Capital city) which is located at about 100 km from Ponta de Ouro sometimes takes more time than information coming from Europe or any other part of the world.

Any organization which is centralized, should have structures and tools to control all the sectors it covers.

In summary, since the existing information,system does not circulate correctly, it is very difficulty to re-organize

it manually. There are well-known and evolving ways by which productivity parameters of communications such as time, money, and "access" to information can be improved through the use of computers.

CHAPTER III

IDENTIFICATION OF NECESSITIES AND PROPOSED INFRASTRUCTURE

III.1. OBJECTIVES

An organization's information system must be constructed with the objective of filtering out unneeded information and conveying only relevant information to the decision maker. The idea of relevance is of great importance, particularly since the advent of the computer.

In the case of NDMM it is particularly difficult to know exactly which information is relevant and which is not.

The organization and structure are new and the interaction of multiple factors working together make the process of conveying relevant information difficult.

However, it may be better to start when people have no defects. It is easy to design a system that spews forth mountains of information but it is much more difficult to decide what small fraction of that information is likely to be useful.

The objective of this study is to show ways which can be useful to improve the tasks of managers in their decisions.

That system must be able to :

- .organize, store and make easily available information in a standard way,
- .keep the information up to date,
- .reduce the paper work,

.slow down the proliferation of file cabinets,

.assist in measuring productivity,

.provide early warnings of problems,

.mediate, direct support and control operations and planning and

.assist in making decisions.

All those tasks can be done easily with the use of computers. This project, will at least try to give ways to achieve the objective defined. The first step will be described below.

III.2. IDEAS OF THE NEW SYSTEM

The first step should be the creation and organization of a center of information and documentation separated to the center of the Ministry. This Center can be divided into two sectors :

- division of documentation
- division of information and publication

The main tasks of these divisions, can be:

A) to make documentary treatment

B) to promote interchange of information and

C) to elaborate publication

The division of documentation, can include two units:

. Legislation

. Technical documentation.

The division of information and publication can include

two units:

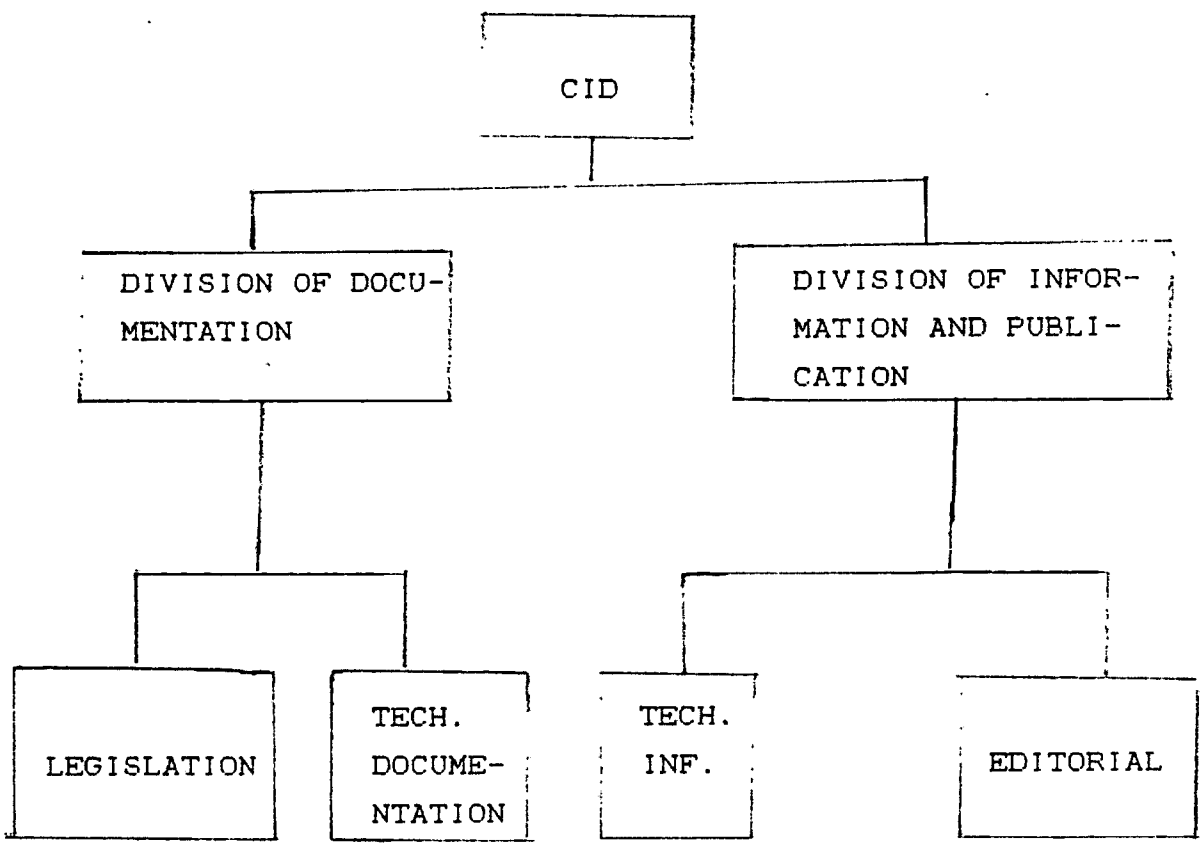
. Technical Information

. Editorial.

One of the main characteristic to take into account in this system, is the possibility of interchanging information with other libraries. IT is also possible to use a UNISIST system given by UNESCO without payment.

The National Library uses this system and the interchange of information will be useful.

This Center can have the following structure:



The objective of this Center should be:

1. to promote the research and documentation of all the information of interest to the merchant marine;

2. to recommend the general policies about acquisition and documentation of technical information;

3. to control and plan the process of acquisition in order to:

   3.1. to elaborate lists of acquisition and promote the circulation in departments.

   3.2. to maintain the connection with accountancy.

   3.3. to control the orders and the entrance of publications.

4. to organize and manage the documentary fund in order to have permanently information up-to-date.

5. to promote diffusion of documentation;

6. To edit publications, such as

   6.1 bulletins

   6.2 interesting legislation

   6.3 periodical publication

7. To make circulation of publication.

The methods to be used should be defined by the person responsible for the department concerned and the national director.

The second step should be the creation of the statistical bureau within the department of planning.

The objective of this service is:

. preparation and publication of data concerning the National Merchant Fleet and the movement of transported cargo in national ships and chartered ships.

. preparation and publication of data for some of the transported goods in liner ships in our zone.

. constitution of a bibliographic database of maritime transport.

An open system which could give diversified data should be constituted. The equipment to be acquired, must have the capacity in order to in the future fulfill the following tasks:

- affreightment of ships.

- discharge of cargo,

- maritime activities; tourism,

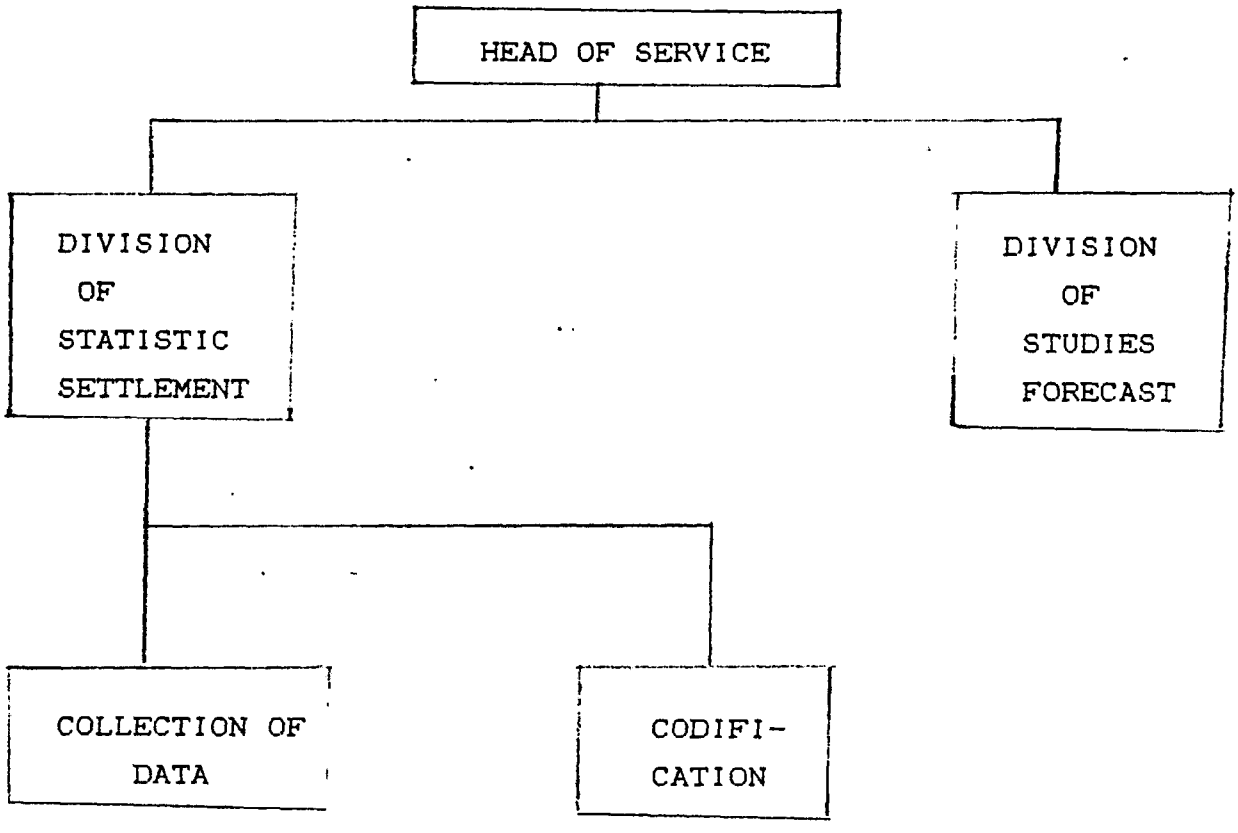
- investment appraisals,

- international conventions

- administrative archive

-accountancy/personnel.

This service can have the following structures



In particular, this service have to elaborate:

- statistics related to maritime transport
- statistics related to marine personnel
- studies related to the utilization of ships and demand forecast.

The person responsible for statistic services reports to the head of the department of planning and to the head of department of commercial navigation.

CHAPTER IV

RECOMMENDATIONS AND PROPOSED SCHEDULE FOR IMPLEMENTATION

At this stage, it is clear that the idea is to comouterize part of the National Directorate of the Merchant Marine. This computerization will be in step by step.

The main role of this computerization is to improve the decision making of the managers.

The process must be.the following:

1) Creation of the Center of Information and Documentation

1.1) Introduction of comouters

2) Creation of Statistic Services

2.1) Introduction of comouters.

The creation of the center of information and documentation must be the first priority. If it suseeds,thi will lead the extension of computerization to other services.

as may be seen below, the process of implementation could take one year.

Possible process of implementation :

Second semester 1990	. decision approving the introductions of computers in . NDMM. . publication of tender documents .supply of computers . elaboration of software
First semester 1991	. implementation of of software . training of personnel . system testing . delivery of equioment

As it could be seen in previous chapters, the center could have two divisions; one for documentation another for information and publication. The person in charge of the center would have to select two persons and train them to organize documents.
One of those persons could deal with legislation. This

means that legislation related to shipping in Mozambique should be re-organized. The main source could be "Boletim da Reoublica", newspapers and documents from international organizations like IMO, UNCTAD, SADCC to which Mozambique is member and others publications to which the center could subscribe.

The international conventions should be organized taking into account those which have been ratified by the country and those which have not been ratified yet.

The person in charge of technical information could have information from different sources including information from shipping companies and other sectors related to shipping. Once introduced to the computer, any kind of information would become available for managers who would use it whenever needed. The time spent with the computers would correspond only to the time needed for giving it the following instrunstions:

- add new information to the files.
- eliminate or update old information.
- sort files and keep them in the proper alphabetic or numerical sequence.
- duplicate records.
- display something from the file in response to the user's request.

IV.1 ORGANIZATION STRUCTURE

By analysing of the duties of the services proposed, the functional separation of the reception/transmission channel of information is clear.

The more important characteristic of Statistic

Services, will be the great diversification of treatment of information.

The system to be acquired, have to be prepared to do so and moreover, must have great flexibility and simplicity in procedures to access of information.

It Is important to take into account these particularities in order to envisage problems in the future.

As I mentioned above the statistic services have to have double subordination.

It will be subordinated to the Head of Planning and to the Head of Commercial Navigation.

The Head of statistic Services, has to co-ordinate all the technical functions with the person responsible for Commercial Navigation and administrative functions with the person responsible for planning.

The Center of Information and Documentation, should answer directly to the national director or to one of the deputy national directors to be appointed.

The idea is that; the Center of Information and Documentation (CID) is a general service, with which many services an have interest. This Center, will have relations with others external services. On the other hand, other external services, may need information from them. It has to be free to establish any kind of of relation which can contribute to up-dating information.

IV.2. OFFICE AUTOMATION/COMPUTERIZATION

I am not willing to present the alternatives of cost. The costs may depend upon many factors.

What I believe is more important before taking any decision, namely:

1. to know what functions to buy;

2. to know how to save money;

3. to know the new requirements for managing change;

4. to know the most possible about the view ahead.

However, I think that the new system must be designed and prepared to automatically execute all statistic data collected. Because of that, this system has to be "open system" in order to be able to treat with great flexibility and simplicity the procedures of having access to information.

This idea will influence the ways of storing data.

The method of organizing a data base is related to the capacity of the future system.

The Statistic Services should have two sources of information:

-One source which could be called "Authentic or Credible", could be received from shippers at the end of a voyage. The basic documents to be used are Cargo Declaration and the Map of Voyage.

A second source of information, which could be called "Preliminary" could be received from the shippers during or before the commencement of voyage. That information is not complete and less credible because it is temporary.

The preliminary information,should be transmitted to the Statistic Services by telephone or by telex. After reception, that information can be introduced directly to the database.

After reception of authentic information, the

information received before, can be corrected and up-dated and then it is possible to "close" the voyage and to publish the final information.

Before collecting information, it is necessary to create files. The number and content of those files will depend on the information needed.

Three files at least it is necessary to create:

1. File of Ships

2. File of Voyage

3. File of Scales.

As regards the file of ships, it will store static data.This means that it will have data which does not vary with the number of movements of ships.

To differentiate the content of those files, they can be classified according to the contract form:

1.Ships that are privately or publicly owned

2. Chartered ships
   2.1 Time charter
   2.2 Bareboat charter
   2.3 Voyage charter

Those files will have the following information:

- Name of the ship
- Flag
- Registration
- Trade inscription
- Type of ship

- Year of construction
- Gross Reg. Tons
- Net Reg. Tons
- TDW
- Propulsion
- Fuel

B. The file of voyages

The information in the file of voyages will depend mainly on what is important to know, which information will be useful for economic analyses. However, the following organization could be useful.

Liner trade	. General Cargo
	. Containerized Cargo
	. Others
Tramp	. Liquid bulk
	. Dry Bulk
	. General Cargo
	. Others
	. Passengers

The content of the file should be:

- Voyage Code
- Registration
- Fuel Consumption
- Fuel Suppled
- Conference
- Liner
- Crew
- Number of Voyages
- Duration

- Total miles

C. File of scale

The file of scales will have the following elements:

. Code of Port-scale
. Day of arrival and departure
. Miles performed
. Next scale
. Code of voyages

The code of port must be divided into four parts. One which identifies the region of the world, another the country, another the region in the country and the last one the port itself.

In the future, it will be necessary to carry out more studies. Those studies must take into account the tasks of each service which will be beneficiary to the new system, the necessity of information, the input/output channels and the the organization of all services with impact on external entities.

IV.3 PROCEDURES FOR DECISION MAKING

In the earlier chapters, the ways as to how the information has to be organized was described. The computer is only a tool which can help in such tasks. However, what is more important, is to make decisions. Information can be well organized in standard ways but without making decisions using that information, the organization is worthless.

A management information system is often a federation of existing business computer data bases or files on a network... with a switch to control. It is an aid to make complex decisions only a manager can or should make.

Good managers seem to have all the information they need to make the right decisions.

Experiences of many managers and organizations that have gone into the developmental implementation of management information systems show that:

. information should guide, not manage people;

. people should manage information systems and that they have to get along with one another.

The design of an integrated information system must be driven by management needs.

- What information is needed in order to make strategic decisions?

- Where and from whom does this information come?

- Who reports to whom?

- What functions does this reporting represent?

- What internal and external data sources can be shared among staff and managers?

- What periodic reports and memoranda flow between reporting stations? What correspondent, decisions, opinions, suggestions, data summaries etc, are flowing between these reporting stations?

CONCLUSION

Automated Management: fact, fiction or future?

" The President of one of the largest computer corporation enjoyed shocking his colleagues by announcing that he never used a computer. Imagine this is a management world where a certain amount of prestige can be cornered by parading your experienced use of computer and data base in decision making, phrases such as "decision support system", artificial intelligence" or "computerized" or "computerized Management". This President drew many double takes from his fellow executives and a certain amount of dismay from his staff.

But people in reality knew that President could use the computer better than almost anyone of his colleagues and if one looked at the record of his company, a great deal better than anyone in the industry. Of course he did not, himself sit at a terminal.

He asked the correct questions of those who did sit at computer terminals. He knew what kinds of analyses his information system could produce. He was very well aware of what was available in the data bases, he had requested to be established. He could precisely develop "what if" questions that kept his staff busy with the computers and the information management system,providing him the information he needed to make the important decisions requested of him.

In short, he was an expert in the use of computers in management. He knew the limitations and the benefits of automated management and he knew how to play these pros and cons very well. That is why he was president of IBM !"

This means that to automate or integrate an office is easy, to computerize the information system is easy too, but it is not possible to computerize management. Management remains an art and a science. Management science is like behavioral science; an early very early stage in the codification of human processes.

What every executive wants is to avoid the unexpected. It is possible to do this by having the information at the fingertips to be able to deal with the inevitable surprises in the most efficient way. The way to do this is to have the information house in order.

CHAPTER V

CONCLUSIONS AND FINAL REMARKS

What I have said so far, is how the implementation of a system, which can assist managers in making decisions should be important for the National Directorate of the Merchant Marine.

However, in doing so,it is necessary to understand the implications on the organizations having this system. A management decision system is aimed at direct support of managers responsible for decision making in the organization. Thev have to accept the necessities to use new technology.

than it is necessary to carry out a specific study. That study which can be called system analysis could start with this paper.

What should be important as next step is to follow the following requirements:

1) Determination of requirements.
   In this phase, it is necessary to make detailed investigations. In these investigations many questions
   have to be answered concerning organization.
   The questions are in general;
   - What is being done and how?
   - How frequently does it occur and how great is the volume?
   - How well is the task being performed?

2) Development of a prototype system - It will provide preliminary information about the workability of the concept.

3) Design of the system

4) Development of software

5) System testing

6) Implementation.

When this stage is achieved or when the system personnel check out and put new equipment into use, other tasks have to be fulfilled. Those tasks are described below.

Training.

One of the more delicate problems when new technology is introduced is training.

When new technology is purchased, it is also necessary to purchase training. It is necessary to include in this training the personnel who will be supervising workers as well as the workers themselves.

It is important to take into account that in order to manage communication technologies, training has to be managed as well.

The training must be planned. Before starting training it is necessary to observe the following elements:

1) Choosing a source of training

2) Selecting and motivating workers for training

3) Ensuring effective follow-through training.

There are several ways to train workers. They can be trained through:

- Manuals, self instructions guides,
- Training packages,
- Vendor workshops or short courses
- Outside schools or commercially available short courses etc,.

Supposing that the source chosen is "training Packages".

In this case it is important to know very well what it consists of which materials will be necessary and where to get them.

It could be got in vendor referrals, newspaper advertisements, yellow pages, communication technology periodicals etc.

The advantages are the costs. The costs may be less than purchasing "live" instruction. There would also be the possibility to review instructional materials.

But, there are also disadvantages.

It will be necessary to still have some supervision of the instructors and perhaps the materials may not fit specific needs, and because of that,it is necessary to check the quality.

On the other hand,it is necessary to train the managers as well. The ways which must be used for training managers are different from the ways to train workers. It is important to carefully look at the sources.

CONCLUSION

Computers are resources that have made it possible for managers to organize, analyze, and use information in more powerful ways. Through its input-output stations, a computing system acts as a fast and flexible controller for the routing, labeling, and transmission of information and instructions. In its memories it can be keep-and can also find and change as instructed-thousands or millions of pieces of information that would take acres to store and years to locate and use if kept on paper.

Computers are still expensive as tools or as tovs; but in an era when the cost of most things has risen, they will do a thousand times more for the money now than they did in 1950.

It is taking time to get used to computers. People have resisted them because they were hard to understand and hard to make work. Tney have, in few case, been feared because seemed to challenge man's role as thinker and decision-maker.

The computers, though, is here to stay: as the nerve center of information networks in the organization; as the cheerful and speedy executor of all sorts of routine information processing; and as a partner to the thinking manager in many kinds of problem-solving and decision-making activities.

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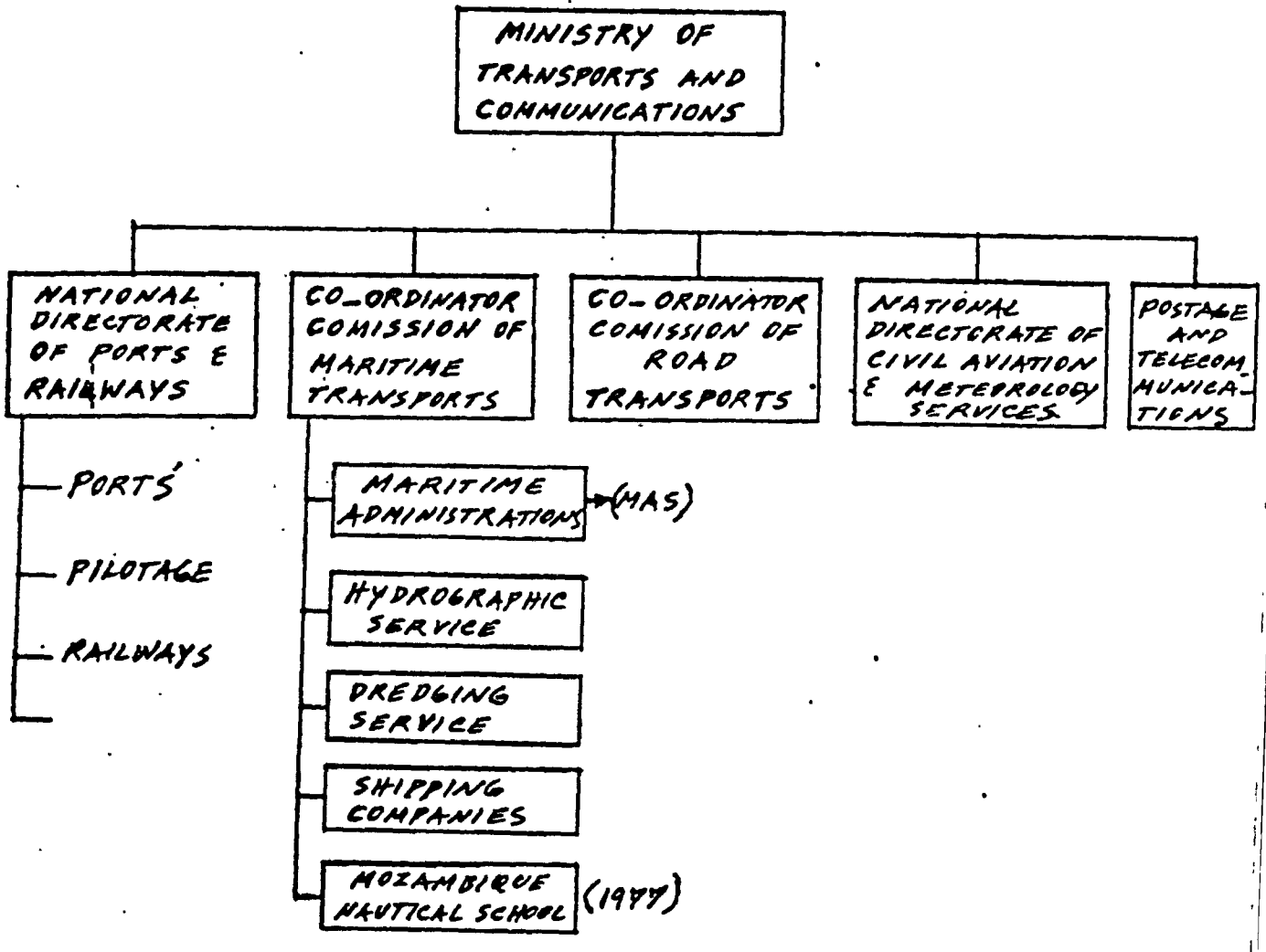
ANNEX 1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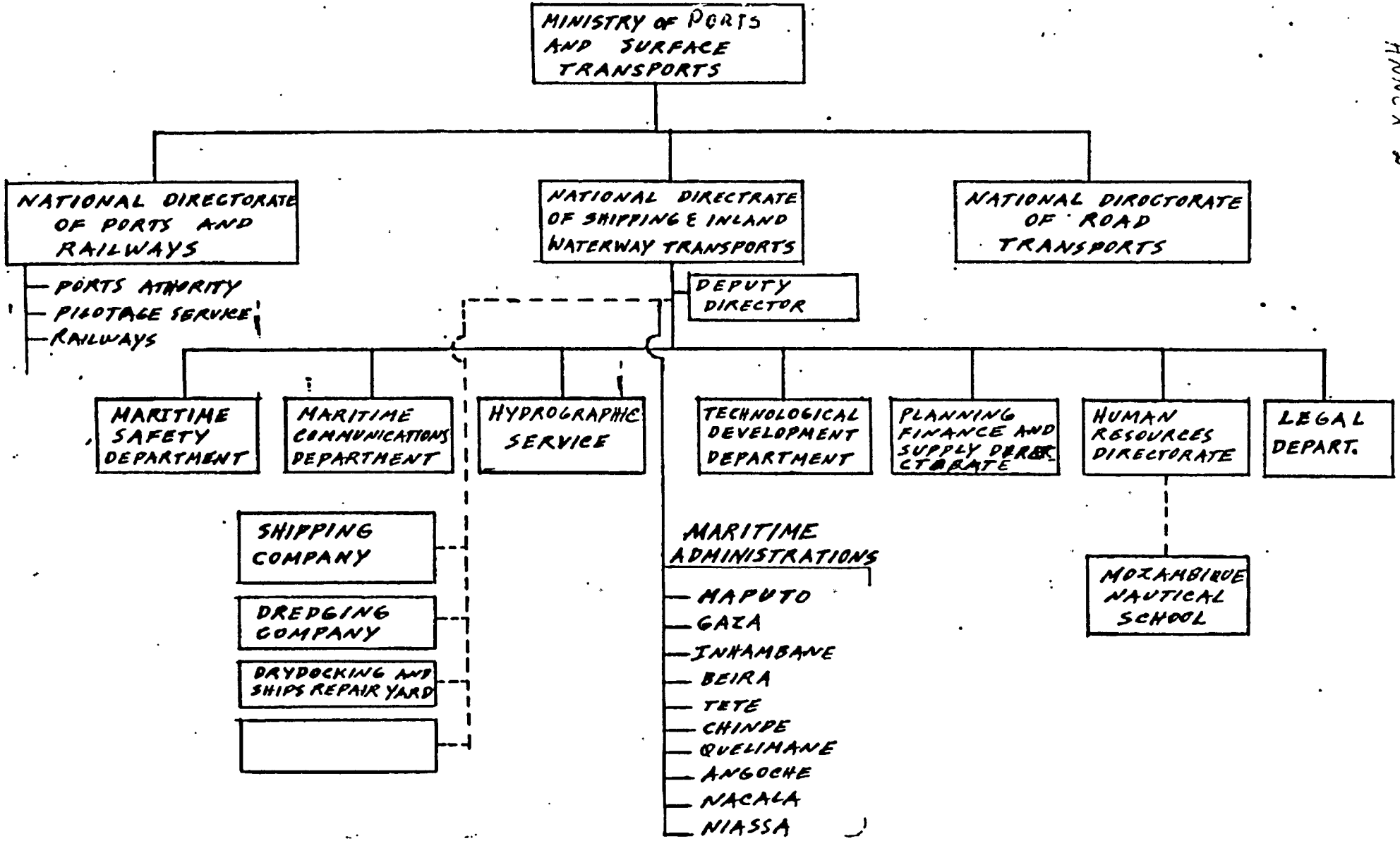
NATIONAL DIRECTORATE OF CIVIL AVIATION E METEOROLOGY SERVICES
POSTAGE AND TELECOMMUNICATIONS
PORTS
PILOTAGE
RAILWAYS
MARITIME ADMINISTRATIONS
(MAS)
HYDROGRAPHIC SERVICE
DREDGING SERVICE
SHIPPING COMPANIES
MOZAMBIQUE NAUTICAL SCHOOL
(1977)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DEPUTY DIRECTOR
MARITIME SAFETY DEPARTMENT
MARITIME COMMUNICATIONS DEPARTMENT
HYDROGRAPHIC SERVICE
TECHNOLOGICAL DEVELOPMENT DEPARTMENT
PLANNING FINANCE AND SUPPLY DIRECTORATE
HUMAN RESOURCES DIRECTORATE
LEGAL DEPART.
SHIPPING COMPANY
DREDGING COMPANY
DRYDOCKING AND SHIPS REPAIR YARD
MARITIME ADMINISTRATIONS
MAPUTO
GAZA
INHAMBANE
BEIRA
TETE
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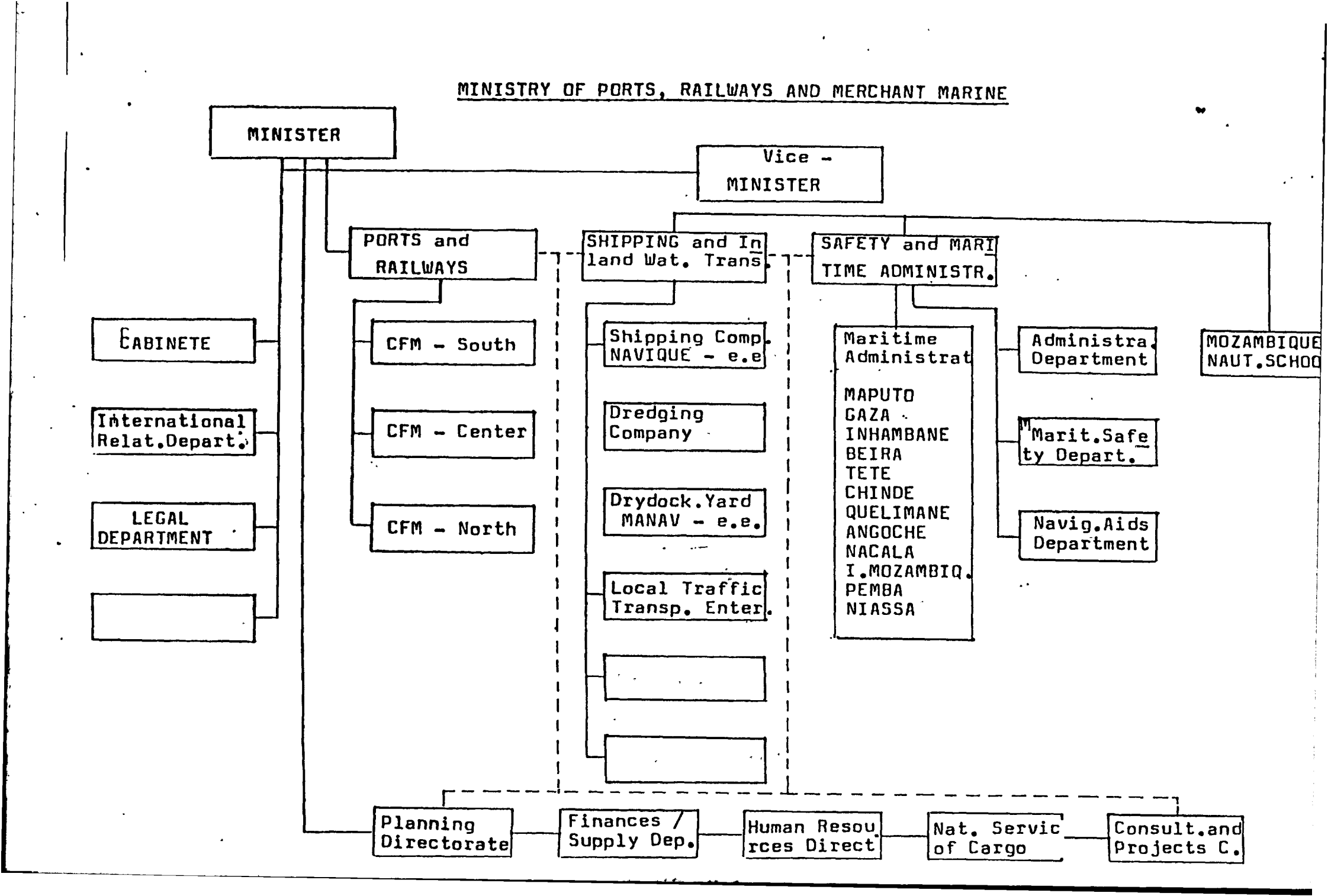
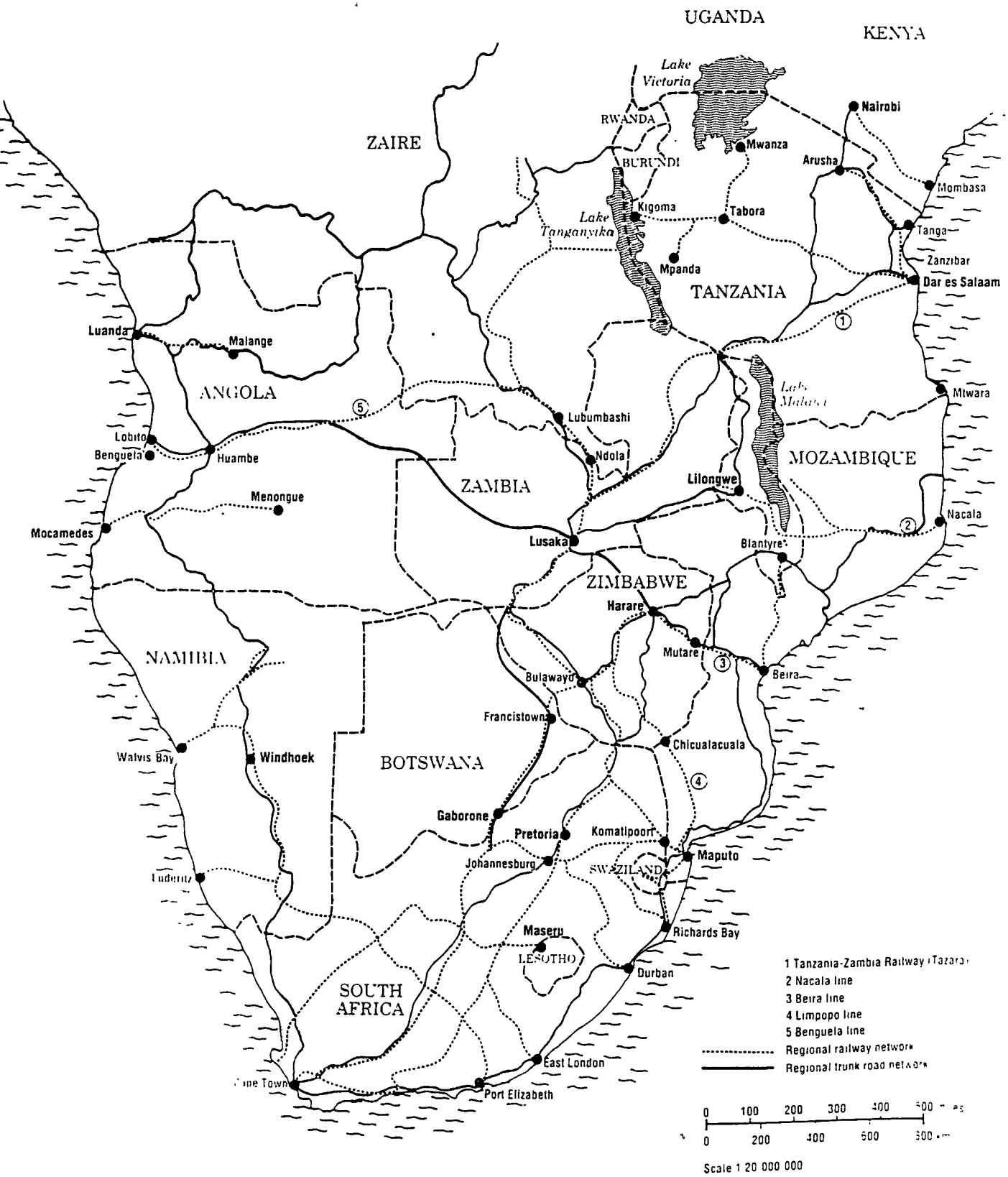
MINISTRY OF PORTS, RAILWAYS AND MERCHANT MARINE



APPENDIX - 1

The railways, ports and major roads of Southern Africa



Chapter One

SADCC Transport Corridors

In March 1988, four truckloads of steel trundled into Maputo along the Limpopo railway which links Zimbabwe with Mozambique's port capital. For four years they had been stranded on the way due to continuous sabotage by the South African-backed Mozambique National Resistance Movement (Renamo or MNR) rebels. The trucks' arrival signalled the re-opening of an almost forgotten route, another victory for recent vigorous initiatives to restore Southern Africa's natural trade routes by combining international finance and local initiative.

A map of Southern African transport routes and a table of distances from the region's capital cities to the main ports (Table 1.1) shows clearly that the ports of Tanzania, Angola and Mozambique are closest for all the Southern African countries apart from Lesotho, whose overseas trade is minimal, and Botswana, though only in some cases.

Yet by mid-1980, largely because of South African-sponsored rebel activity in Mozambique and Angola, coupled with poor maintenance and management along the Tazara line linking Zambia with Tanzania, fully half the region's traffic was moving through South African ports.

Formed in 1980, the Southern African Development Co-ordination Conference (SADCC) - made up of Zimbabwe, Zambia, Tanzania, Botswana, Lesotho, Swaziland, Mozambique, Angola and Malawi - set out to reverse this situation. Its policy was that "without the establishment of an adequate regional transport and communications system, other areas of co-operation become impractical." Though in general it adopted loose structures in areas of co-operation, SADCC made sure to set up a permanent commission to oversee the crucial transport sector: the Southern African Transport and Communications Commission (SATCC) with headquarters in Maputo (see Annex 1.1).

Unlike many other parts of Africa, the SADCC region is well endowed with basic transport infrastructure - some 12,500 km of railway in all. The challenge was therefore not so much to create as to rehabilitate roads, railways and ports battered by a decade of war, poor management and neglect.

Never before has so much attention been paid to transport in the region. Elsewhere in Africa aid may be drying up, but SADCC has managed to raise 40.2% of the $2,818.3m it seeks for the five main transport systems to the ports of Beira, Dar es Salaam, Maputo, Nacala and Lobito (see Table 1.2). It achieved this in part by playing on the consciences of Western nations which hesitate to

Table 1.1

Railway distances to major ports *(km)*

	SADCC					*South Africa*	
	Dar	**Beira**	**Maputo**	**Lobito**	**Nacala**	**Durban**	**E London**
ZAMBIA							
Lusaka	2,045	2,026	2,035	2,679		2,812	3,116
Ndola	1,993	2,334	2,353	2,361		3,130	3,434
ZIMBABWE							
Harare		698	1,178			2,077	2,404
Bulawayo		1,181	1,061			1,859	1,921
BOTSWANA							
Francistown		1,377	1,257			1,663	1,725
Gaborone		1,813	1,693*			1,409	1,289
MALAWI							
Blantyre		567			840	3,342	3,669
SOUTH AFRICA							
Johannesburg			636			777	1,016

* Distance via Bulawayo; the distance via Johanesburg is 1,268 km.

Source: *SADCC, Progress Projects and Prospects Special Report No. 182* by Joseph Hanlon, Economist Intelligence Unit, London.

Table 1.2

Summary of costs and funding for the five main SADCC transport corridors *(All amounts in $ million)*

Project Type	No. of Projects	Project Costs Total	Foreign	Local	Secured Funding Total	%	Funding under Negotiation Total	%	Funding Gap Total	%
Maputo Port Transport System Projects	19	758.1	639.1	119.0	212.9	28	10.0	1	535.2	71
Beira Port Transport System Projects	5	614.6	574.6	40.0	257.8	42	90.1	15	266.7	43
Nacala Port Transport System Projects	4	277.9	234.2	43.7	261.1	94	0.0	0	16.8	6
Dar es Salaam Port Transport System Projects	6	601.2	520.8	80.4	369.9	62	47.6	8	183.7	30
Lobito Port Transport System Projects	5	566.5	560.4	6.1	30.1	5	0.0	0.0	536.4	95
TOTAL	39	2,818.3	2,529.1	289.2	1,131.8	40.2	147.7	5.2	1,686.5	59.8

take stronger measures against South Africa. Overall, SADCC's efforts have started to pay off, particularly where security problems have not been a major hindrance.

Since 1986, international attention has focused sharply on Mozambique's port of Beira. This, coupled with military protection provided by the Zimbabwean army, enabled its throughput to increase from 1.33m tonnes in 1986 to 1.94m tonnes in 1987, mainly as a result of rising volumes of Zimbabwean cargo (see Table 1.3). By the second half of 1988 Zimbabwe was sending roughly 35% of its overseas trade through the port.

Major developments have also taken place along the Tazara railway - the only SADCC corridor which faces no security threat at the moment - and at the port of Dar es Salaam, which handled 2.2m tonnes of dry cargo in 1987, compared with 1.73m tonnes the year before. Most of the increase represents rediverted Zambian cargo, which had sunk to about 30% of its total trade. Currently, 80% of Zambia's exports, mostly copper, and 45% of its imports pass through Dar es Salaam.

Malawi now spends 40% of its export earnings on transporting goods to South African ports by road, because Renamo regularly sabotages the lines linking it with Nacala and Beira. So it is also a potential user of Dar es Salaam port, which it can reach by the complex lake, road and rail route which SADCC terms the "Northern Corridor".

At 2.17m tonnes, the 1987 throughput of SADCC cargo in Maputo port remained well below capacity. Also for security reasons, traffic through Nacala and Lobito ports was negligible.

Yet according to preliminary estimates, a total of 6.85m tonnes of SADCC cargo passed through SADCC ports in 1987. While this is down on 1981 (see Table 1.3), it nonetheless represented 63% of the region's total overseas trade of 10.2m tonnes.

Between 1989 and 1992, further rehabilitation of Beira and Dar es Salaam ports is likely to boost capacity by three to four million tonnes. Similarly, the capacity of Tanzania's smaller southern ports could be boosted to one million tonnes, with possible benefits for Malawi if the road linking it with Mtwara is upgraded.

When phase one of the Limpopo Corridor project is completed, linking Zimbabwe with Maputo, Zimbabwean cargo volumes along the southern route to Maputo will rise from zero to one million tonnes. If funding for the project's second phase is secured - it was still being finalised in the second half of 1988, following a mid-year donors' conference - volumes will rise still more. SATCC is also seeking funds to rehabilitate the Goba line linking Maputo to Swaziland, which is crippled both by security and technical problems.

Meanwhile, in one of Southern Africa's many paradoxes, there are signs that businessmen in the northern Transvaal, who used to send some six to seven million tonnes of cargo a year through Maputo, would like to see the port functioning again. One of Africa's finest ports, Maputo could, with very little work on its infrastructure, begin handling eight million tonnes of cargo virtually overnight.

Similarly, Nacala is one of the finest deepwater ports in Africa, and has already undergone major rehabilitation. It could at present handle up to two million tonnes of cargo, including virtually all Malawi's imports and exports. However, work on the railway has been temporarily suspended for security reasons.

Finally, despite the tremendous security problems in war-ravaged Angola, SADCC is planning a major donor conference in early 1989 to raise over $500m to rehabilitate the Benguela railway to the Angolan port of Lobito.

Table 1.3

SADCC traffic through SADCC ports *(million tonnes)*

	1981	1985	1986	1987[1]
Maputo[2]	3.45	2.19	1.86	2.17
Beira	1.66	1.4	1.33	1.94
Nacala	0.78	0.20	0.22	0.28
Dar es Salaam[3]	1.94	1.3	1.73	2.21
Lobito	0.40	0.26	0.25	0.25
TOTAL	8.23	5.35	5.39	6.85

[1] Preliminary figures
[2] Figures exclude South African traffic through the port of Maputo
[3] Dry cargo only

Source: CFM, Maputo; Tanzania Harbour Authority, Dar es Salaam; SATCC, Maputo.

The port theoretically has a capacity of 3.6m tonnes. Despite frequent attacks by rebel leader Jonas Savimbi's Unita movement, the line is carrying domestic cargo again after almost a decade of disuse. Its rehabilitation to carry export cargoes is considered technically possible, and would provide another option for Zambia, as well as being of major benefit to Zaire.

All in all, SADCC ports will have the capacity to handle volumes well in excess of the region's total overseas trade within the next three to five years. Whether this will actually lead to transport self-sufficiency for the region depends on a number of factors.

The key factor, of course, is security.

In November 1988, agreement was reached between Angola, Cuba, the US and South Africa over a timetable for the withdrawal of Cuban troops and a formula for Namibia's independence. Unita had not participated in the negotiations and threatened to continue fighting. And although South Africa had withdrawn its troops from Angola, it and the US continued to provide support and supplies to Unita and this rebel movement's continued war-mongering remained unresolved.

At the same time, Mozambique's President Joacquim Chissano, caught in a seemingly endless war of destabilisation, renewed high-level dialogue with South Africa and met with President Botha at Cahora Bassa dam in September 1988. Agreement was reached on rehabilitation and security measures for the powerline to South Africa, for which South Africa was even going to provide non-lethal equipment for Mozambique's troops.

Whether these agreements would lead to lasting peace was still uncertain, but it seemed clear that terrorist activity, including sabotage of transport routes, would continue for the foreseeable future in the two ex-Portuguese colonies. It was likely that Botha's sudden flurry of diplomacy was determined more by the need to outshine the growing opposition he was facing at home than by any true commitment to regional peace. Regional stability remained subject to the whims of white politics in South Africa.

Security a priority

Meanwhile, however, work on rehabilitating some transport systems continued while more was planned. Security is a priority for SADCC transport projects. On the east coast, the burden of securing Mozambique's railway lines will continue to be shared by the Mozambican, Zimbabwean, Malawian and Tanzanian armed forces deployed there. Securing the lines of communication through Mozambique will probably remain top priority for these countries. The mid-1988 talks on Zimbabwe's involvement in protecting the Limpopo line were part of this policy. Moves to open the Nacala line, too, are likely to involve the Malawian and Tanzanian forces stationed in the north.

Increasingly, however, Western donor governments are beginning to perceive that their interests are not served by pouring aid into massive infrastructural projects, only to watch them blown up again. Thus Britain, for example, is training Mozambican troops to guard the Limpopo corridor. A recent development is the use of the private British security firm **Defence Systems Ltd** (DSL) to train Mozambican troops guarding the Nacala corridor. Using DSL to develop security for the Goba line linking Maputo with South Africa is also under consideration.

Although uncertainty still surrounds the routes leading to the Mozambican ports of Nacala and Maputo, solutions will probably be found on an ad hoc basis. Similarly, SADCC recognises that any efforts to revive the Benguela railway must deal with the security problem, possibly by means of an understanding with UNITA brokered by the Americans.

But security is by no means the only issue that must be dealt with. Mozambican port officials, for example, have charged that Zimbabwean businessmen refuse to use the port of Beira because of their attachment to South Africa.

As a recently completed SATCC study on shipping and forwarding in the region notes: "Attracting goods from the landlocked countries through Mozambique and Tanzania is a matter of competing with an extremely efficient alternative, that of the Republic of South Africa, at least as long as the borders of that country are still open. The fact that transportation through RSA is on average more expensive than through Tanzania and Mozambique is a premium that most clients in the inland appear to accept in exchange for gurantees of timely delivery.... Sophisticated transport equipment and techniques prove futile unless supported by corresponding paperwork and commercial service."

SATCC is acutely aware of this problem. In its 1986-87 report, the commission states that "parallel with these increases in the physical capacity of ports and railways, emphasis is also being given to improving management and support services."

According to figures for January 1988, almost half the money required for SATCC operational and training projects ($56.2m) had been raised (see Annex 1.2), with substantial amounts already allocated for management assistance to the Mozambican ports.

The SATCC study mentioned above, while noting the "excellent skills and ability to offer service to the SADCC region by the two main shipping services in the SATCC" - **Manica** and **AMI** - recommends that greater use be made of clearing and forwarding agents in member-states, and proposes that a transport information bureau be established in inland countries.

The port authorities, too, have recently been adopting a more businesslike and aggressive marketing approach. Evidence of this was the visit in 1987 by Tanzania harbour authority officials to Zimbabwe and Botswana, and numerous marketing trips, both overseas and within the region, by officials of Mozambique's Caminhos de Ferros de Mocambique (CFM).

Given a sustained drive to improve the region's port networks both physically and operationally, officials argue that the last ingredient needed to make them viable is for businessmen, governments and aid agencies to start making use of the facilities. "What we are saying," says Eddie Cross, managing director of the Zimbabwe-based Beira Corridor Group, "is don't sit on the sidelines and snipe. Come down on the playing field and help us play the game."

Annex 1.1

SATCC organisation

The basic organisational structure of SATCC consists of:

(a) A Committee of Ministers;
(b) A Co-ordinating Committee of Senior Officials; and
(c) A Technical Unit (TU)

The SATCC Technical Unit, the Commission's secretariat working under the responsibility of the chairman of the SATCC Co-ordinating Committee, has until recently, been wholly staffed by technical assistance personnel from the Nordic countries and, to a lesser extent, from Italy. In the past couple of years the work-load of the Technical Unit has been growing rapidly, particularly in relation to operational co-ordination, preparation of documentation for studies, projects and meetings, and increasing demand for information and advice from organisations, institutions and individuals from inside and outside the region. While this has put a heavy pressure on the capacity of the Unit, it is seen as a positive sign of increasing recognition of the Commission's central role and competence as a focal point in the co-ordination of the transport and communications sector in the region.

Consequently, the SATCC Technical Unit has been strengthened. Regionalisation of the professional staff of the Unit was started with the appointment of a Zambian telecommunications expert as an ITU representative.

The establishment of a SATCC Documentation System started in 1986. It is a computerised referral system containing bibliographical and project databases. Databases on transport, telecommunications and postal statistics are being established, as parts of the Information and Documentation System. The system is housed at SATCC Headquarters in Maputo, for the benefit of the Technical Unit, member-states and working groups in all SATCC sub-sectors.

To ensure a regular flow of inputs and outputs between the system and member-states, a network comprising one liaison officer from each country has been created. A regional documentation expert is at present being recruited in order to ensure appropriate manning of the system.

The SATCC's operational co-ordination work aims at:

- Improvement of capabilities in the member-states to manage, operate and maintain their transport and communications systems and facilities.
- Elimination of institutional obstacles to the movement of traffic in the region, including harmonisation of standards, rules and regulations.
- Promotion of bi- and multilateral agreements on operations.
- Actions related to routing of traffic through regional ports.
- Co-operation between airlines.
- Increasing utilisation of regional resources and know-how.

This work is a vital complement to the capital investment projects. While the investment projects aim at rehabilitation and improvement of the physical infrastructure and facilities, the purpose of the operational co-ordination activities is to ensure the efficient operation and use of those facilities. Specific objectives and programmes have been defined for this work in each transport mode and sub-sector.

For the direction and co-ordination of this work, working groups consisting of representatives of all member-states have been established and are meeting on a regular basis in the following fields:

1. Road Infrastructure
2. Road Traffic Transport
3. Railway Administration
4. Civil Aviation Administrations
5. National Airlines
6. Port Administrations
7. Shipping, Clearing and Forwarding
8. Telecommunications (SATA)
9. Meteorology
10. Postal Services

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Annex 1.2

Operational and training projects relating to transport *(million US$)*

	Cost	Secured
Operational Co-ordination Development Programme		
Road infrastructure	0.5	0.5
Road traffic and transport	1.1	1.1
Railway administration	0.8	0.8
Port administration	0.6	0.6
Transit transport project	4.8	1.3
Regional co-operation in shipping	0.6	0.2
TOTAL	**8.4**	**4.5**
Training Development Programme		
Road traffic and transport training study	0.2	0.2
Study on railway training programme	1.6	1.6
Development of railway training regional	8.6	0.0
Development of railway training in Mozambique	25.3	17.9
Port school Lobito, Angola	5.3	0.0
Port staff training institute Mozambique	6.8	6.8
TOTAL	**47.8**	**26.5**

Source: *SATCC*, January 1988

Annex 1.3

SADCC railways: contacts

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National Railways of Zimbabwe (NRZ)
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Telex: 0907-3173 NRZ ZW

Zambia Railways
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TAZARA
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Swaziland Railway
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Direccao Nacional dos Portos e Caminhos de Ferro (DNPCF)
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Ministry of Works and Communications
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Telex: 0962-2743 WORKS BD

Caminhos de Ferro de Benguela
Cleofas Silinge, General Manager
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Telex: 0991-8253

Caminhos de Ferro de Angola
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P O Box 1250c, Luanda, ANGOLA
Telex: 0991-3224; Telephone: 70061

Chapter Two

The Maputo Port Transport System

The Maputo port transport system is undoubtedly the most important of SADCC's five main transport arteries. As Mozambique's capital and main port, it houses the headquarters of SATCC and that of Mozambique's railway corporation, CFM (see Annex 2.1).

More important, it is the only port in the region where, with minimal effort, throughput can be virtually quadrupled overnight - given security on its main access routes. As one transport source puts it, it's a system "vibrating and waiting to go."

Maputo is also the only port in the SADCC network in whose efficient operation South Africa has a vested economic interest. This fact generates a series of paradoxes: SADCC and South African-sponsored work in the port often overlap, while, ironically, the parastatal South African Transport Services (SATS) frequently has to repair damage caused by South African-backed Renamo rebels.

That powerful economic interests in South Africa do want Maputo, unlike any other SADCC port, to function properly may offer strong hope for its future.

Economically, it is the most viable harbour for the imports and exports of most of South Africa's rich northern and eastern Transvaal province. Maputo is also the closest port to Swaziland and southern Zimbabwe. Although it is much further from Harare than Mozambique's northern port of Beira, a decade ago Maputo was the preferred port option for the whole of Zimbabwe because of the variety of handling facilities it offered. It is also an advantage that the Limpopo railway crosses easier terrain than the Machipanda-Beira line. The Limpopo line, through its link to Bulawayo, also connects Maputo with the Zambia, Zaire and Botswana railway systems.

At its operational peak in 1974, Maputo handled over 10m tonnes per annum (tpa) of cargo, and, after Durban, was the second-largest port in Africa. Then its decline began. Soon after Mozambique became independent in 1975, it closed its border with white minority-ruled Rhodesia, cutting off 2m tpa cargo from Maputo. As Table 1.1 shows, traffic increased briefly after Zimbabwe became independent in 1980, although it never exceeded 1m tpa. By 1984, the route had been closed altogether as a result of Renamo attacks. What Zimbabwean cargo does come through (396,000 tonnes in 1987) passes via Beit Bridge and Komatipoort, then north to Maputo via the Ressano Garcia line.

Swaziland's traffic was down from 1m tonnes to half

Table 1.1

Maputo port traffic 1980-87

	1980	1981	1982	1983	1984	1985	1986	1987
TOTAL	7,603,500	6,431,200	6,286,000	4,085,000	3,072,600	2,745,900	2,478,400	2,650,100
Cabotage								
in	130,700	220,000	343,600	358,300	189,700	80,400	104,300	198,300
out	106,300	256,400	297,500	165,100	119,900	70,400	86,500	148,700
Mozambique exports	440,400	270,100	317,000	124,300	108,300	42,400	84,100	81,700
Mozambique imports	1,612,500	1,202,900	1,309,400	894,400	803,500	915,900	740,300	759,700
Transit exports								
South Africa	2,345,800	2,002,100	1,533,000	1,032,400	604,400	555,300	617,000	457,800
Swaziland	1,255,600	683,400	673,100	551,000	514,600	600,600	503,900	585,000
Zimbabwe	164,000	366,900	501,800	305,400	337,000	362,000	311,500	396,600
Malawi	-	-	-	-	-	-	-	-
Others	41,500	31,800	6,700	-	-	3,800	-	400
Transit imports								
South Africa	1,406,900	978,400	902,100	479,600	180,900	32,200	2,000	21,900
Swaziland	65,000	41,700	75,700	24,000	9,900	600	300	-
Zimbabwe	30,300	370,000	323,400	149,100	190,500	41,500	700	-
Malawi	-	-	-	-	-	-	-	-
Others	4,500	7,500	2,700	1,400	13,900	40,800	27,800	-

Source: CFM Maputo

CFM commercialisation drive

In addition to the security problems which have led to a major loss of traffic for Mozambique, the contract rates introduced between 1984 and 1986 for shippers in Zimbabwe and Malawi reduced rates to South African ports by one-half of those for the Mozambican routes. Although SATS argued that it was introducing these rate-cutting packages because it faced growing competition from road transport internally, and therefore had to find new ways of regaining traffic, the move was seen within SADCC as part of South Africa's overall destabilisation policy.

However, as part of its efforts to revitalise the transport systems of Mozambique, the CFM, through its newly established commercial department, has started negotiating contracts with clients who will guarantee minimum volumes and by mid-1988 had concluded over 20 major deals. CFM has established offices in Zimbabwe, Malawi and Swaziland (see Annex 2.1 for addresses) and restructured tariffs to make them more competitive and flexible. On 1 July 1986, the CFM introduced a new container tariff which consolidated previous ad valorem based charges. The new rates apply both to import and export containers (in contrast to Tanzania and South Africa, where import containers are charged twice the export rate) in an effort to eliminate the difference between traffic coming in and that going out. Even with the discounts offered by SATS, the Mozambican ports are now a far more competitive option for the SADCC countries closest to them.

that in 1987, a result of Renamo attacks coupled with the poor condition of the Goba line. Most Swaziland cargo now takes the longer route to South Africa's Richards Bay port, while some of the rest now reaches Maputo via Komatipoort.

Even the Ressano Garcia line, which links South Africa with Maputo, is constantly under Renamo seige. It was out of operation almost 50% of the time during the first half of 1988. This, combined with a deliberate South African "sanctions" policy against Maputo after SADCC was formed in 1980, caused South African cargo volumes through Maputo to plummet from peaks of between 6m to 7m tpa in the 1970s to a paltry 479,700 tonnes in 1987. In that year the port handled a mere 2.65m tonnes of cargo all told - about 25% of its capacity.

What has changed since then? Indeed, quite a few factors.

In 1987 Mozambique embarked on an IMF-sponsored economic reform programme which aimed to correct some of the major distortions in its ailing economy, while emphasising the role of the market. Reviving the transport sector - which once provided one-third of the country's foreign exchange earnings - was recognised as a key element.

So the CFM, which runs Mozambique's railways and ports, embarked on an aggressive marketing campaign. It has come up with rate-cutting packages to ensure that Mozambique's ports are competitive, and has opened offices in all key SADCC countries (see Annex 2.1). "We can and will offer a commercial service," says Ferreira Mendes, CFM national director of ports and railways.

In addition, the port receives substantial financial assistance from South Africa and Western donors for its specialised handling facilities and marine services. Thanks to Italian and British funding through SADCC, the port now boasts the most modern and efficient container terminal in Southern Africa.

One of SADCC's Maputo port projects, the rehabilitation of the Limpopo line, is finally showing signs of life. By mid-1988, after the project's first phase, it could carry a train a day in each direction. The target is five trains a day. This depends on the second phase of rehabilitation succeeding - and, of course, on adequate security arrangements.

The Limpopo corridor, in the words of one freight agent, "is going to be our salvation."

A study of the Goba line, too, is now complete. Apart from the usual security problems, it is also in a precarious mechanical state. Through SADCC, funds are being sought to refurbish it, and discussions continued in the second half of 1988 on how to secure it against sabotage.

South African involvement

Evidence of renewed South African interest in Maputo port is another development that gives grounds for cautious optimism. After the 1984 Nkomati Accord, the South African government sponsored preparation of a $75m master plan for the port by a Johannesburg company of engineers and project managers, **Techni Multidiscipline Services (TMS).**

Using a R2.48m South African government soft loan to Mozambique, TMS has completed phase one of the plan. Starting in June 1987, it refurbished two of the six specialised handling facilities and a general cargo berth. The company was scheduled to embark on the R3m-worth second phase in mid-1988, which involves managing the refurbished facilities.

A key question for the Maputo port system and for Mozambique as a whole is, of course, what South Africa's intentions are: destabilisation as usual, or decreased disruptive activity? One theory has it that, now that the threat of international sanctions is increasingly becoming a reality, South Africa may wish to develop Maputo as a sanctions-busting route.

Such longer-term factors aside, there are also more immediate economic imperatives. "You must remember that it is a free enterprise system (in South Africa)," says Pretoria's deputy trade representative in Maputo, Timo Beukes. "If I'm a businessman, a coal mine owner in Messina, northern Transvaal, why would I send my coal down to Durban, at double the price?"

The benefits cut both ways, as Mendes agrees. "Our policy is to maintain and attract business to Maputo. If we get more South African exporters and importers, it would help us economically, it would be cheaper for the South Africans, and it would go some way towards fostering good neighbourliness," he says.

Because the loans for TMS's work on port facilities

operate on a rebate basis, increased traffic from South Africa is essential before any work on the next two phases (which aim to raise throughput over a five-year period to 8m tpa) can begin.

"We are in a chicken-and-egg situation right now," says Don Renaud, TMS construction manager in Maputo. "They won't send the traffic because the line has a bad record, and we can't improve the record if they don't send the traffic."

Officially, South Africa denies aiding Renamo. However, as in the case of the Cahora Bassa hydroelectric power scheme, it is generally accepted that Pretoria has the power to improve the security situation along the Komatipoort access route. This is an issue which has no doubt featured prominently in the talks between Chissano and Botha. For its part, the CFM has indicated its desire to improve conditions by introducing a specially trained "railway police force" along the route.

Meanwhile, any analysis of developments along the Maputo port transport system has to take into account both the SADCC and the South African plan (summarised in Annexes 2.2 and 2.3).

By far the lion's share of the SADCC budget of $758.1m for the Maputo system is allocated to road and rail access routes. (A number of these involve roads and railways in Lesotho and Botswana which are only indirectly relevant to the overall plan, but which are classified as part of the Maputo system for convenience.)

The SADCC programme considers the Komatipoort route to be in fairly good physical shape and concentrates on the Limpopo route, the Goba route, the road linking Swaziland with Maputo, as well as proposals for a road to link Zimbabwe with Maputo.

The South African master plan, in contrast, does not budget at all for access routes outside the port, except for that through Swaziland. While the SADCC programme hopes to raise $121m for the port itself, some 75% of that ($89m) is to be used to increase the capacity of the Matola coal terminal to 7m tonnes. The success of these projects hinges on whether or not that much coal ever comes through.

The South African master plan, on the other hand, contains far more detailed agendas for improving the port, including repairs to the quays, new buoys and accommodation. Some chapters of the plan containing such proposals have been handed to Western donors, who are now funding the projects.

However, even without extensive repairs, Maputo port can easily handle more cargo than at present. Says Neil Young, project director of **Portia Management Services**, the British team of consultants at Maputo, "We have more than enough spare capacity to handle existing trade. We are more interested in getting the existing facilities working than playing around with wild schemes at the moment."

However, in October, as a follow-up to the meeting at Cahora Bassa between Presidents Botha and Chissano, South Africa and Mozambique signed a $1.2m loan agreement on 20 October for "the total repair and extension of Maputo harbour". This would give added impetus to South Africa's master plan and increase its involvement in the port.

Access routes

Three 1,067-mm guage railway lines and two roads make up the port's main surface access routes, which are described in detail below.

Zimbabwe-Maputo

This line, known as the Limpopo Corridor, is 538 km long, stretching from Chicualacuala on the Zimbabwe border along the banks of the Limpopo river to Maputo (see general map, Chapter One). Because the gradient and curvature are not severe, its maximum trainload is much higher than that on the Beira-Machipanda line.

Transit traffic carried to Maputo via the Limpopo Corridor at its peak in the early 1970s, when the line handled up to 2m tpa, was a valuable source of foreign exchange for Mozambique. Strategically, too, the route is important because it links Maputo with Zambia, Zaire and Botswana.

But after 1984 traffic ceased and the line died. With its first rehabilitation phase completed by mid-1988, it was possible for trains to pass along it, although at very low speeds.

A donors' conference was held in Maputo at the end of July 1988, at which firm pledges of $60m were secured for the second phase of rehabilitation.

Phase One

Work on the first phase of rehabilitating the line started in August 1986, with funding from the British ODA ($25m) and local costs equivalent to $2m being met by the Mozambique government. The project was implemented by the Brigada de Melhoramentos do Sul (BMS), a branch of CFM south under engineer Pedro Figueueredo, former head of SATCC.

Technical assistance was provided by the British consultants, **Mott Hay and Anderson**, under project director Reg Masters (see Annex 2.2).

There were two main elements to the work in this phase:

Trackwork, which involved:

1. Relaying 62 km of track from Chicualacuala south to Maputo, which has been completed by the National Railways of Zimbabwe (NRZ), under contract to BMS. Described by Masters as "a superb job done in record time", it involved the NRZ laying 40 kg/m continuously welded rail on concrete sleepers with Pandrol fastenings, where before the track comprised 30 kg/m rails spiked to timber sleepers. NRZ provided management, labour, tools and plant for the work, which was completed successfully despite security problems.

2. Resleepering and reballasting three sections of mainline track totalling 80 km, from the Maputo end toward Zimbabwe. Existing track comprises 40 kg/m rail fastened with spikes to timber sleepers which have rotted, causing gauge widening. Very little ballast exists. Some earthworks and cross-drainage structures may also need

attention.

The work, carried out by BMS labour, supervised by Mott Hay and Anderson, started in mid-1988 and is expected to be complete in August 1989.

In preparation for this, three facilities are being revived to provide the necessary materials:

- An existing concrete sleeper factory at Umbuluzi has been revived with the aid of **Dow Mac** (UK). The design of sleeper has been changed to give a wider choice of source for prestressing strand than the previous design permitted. The factory, which was producing by August 1988, is planned to have a capacity of 100,000 sleepers a year. Four expatriate staff are to be provided by Mott Hay and Anderson to help operate the factory.
- At present the southern railway line system does not have its own ballast production unit. A rock-crushing plant rated at 130 m^3/hour was to be commissioned in August 1988. The project includes mobile equipment for loading and transporting rock to the plant, and drilling and blasting equipment. A quarry master and plant maintenance engineer will be provided as part of the technical assistance team.
- The permanent way depot is to be rehabilitated through provision of spare parts and technical assistance.

3. Within the port, CFM (Sul) has identified 30 km of plain line and 62 turnouts which require attention. The plain line will be relaid with 40 kg/m rail recovered from an earlier relaying of the Ressano Garcia line. This will be long-welded and laid on either steel or timber sleepers. Turnouts, complete with timbers, are being supplied by the UK. BMS labour will undertake this work, supervised by Mott Hay and Anderson.

[Note: This work coincides with projects identified in the South African master plan. This also identifies poor track condition in the Machava yard, which serves Matola. The project is being sponsored by Italy, which has provided a R2.7m grant (which corresponds with the master plan estimate) to upgrade the railway network in the Machava yard. Remaining needs are the maintenance and refurbishing of track in the Matola yard, and improvement of roads in the harbour areas, as the main surface transport routes in the port identified by the master plan.]

Telecommunications

A contract has been signed with **Plessey UK** to provide and install a UHF and VHF radio system from Chicualacuala to Maputo. Radio and teleprinter links between CFM (SUL) and NRZ will also be set up, as well as radio links between locomotives and nearby stations, and a works radio system linking BMS headquarters with the various depots and site camps. Plessey has started the design work and manufacture of radio sets and other equipment. Its team will soon be in Mozambique to do the installation. Work is scheduled to be completed in April 1989.

Current state of the line

By mid-1988, it was possible to run a train through, as proved by the arrival of the long-delayed four trucks of steel mentioned earlier. Others included a train carrying emergency food aid which went the full distance of the line, and an inspection trip by a team of Mozambican, Canadian and British engineers in May. The line is expected to open to commercial traffic in July, but will be able to take only one train with a gross mass of 1,500 tonnes in each direction per day.

"It is possible to run a train, but the incidence of derailment is high, due to the state of the track," said Masters. What is now required, he added, is to "put the whole line in good order, resleepering and reballasting, and a considerable amount of new rail, though not necessarily throughout."

Phase Two

Mott Hay and Anderson, together with the Canadian joint venture **SLI**, which groups **Swan Wooster, Lea and Associates** and **International Rail** (part of British Columbia Rail) are putting the finishing touches to a feasibility study for the $103m second and third phases of the project.

The SADCC project document lists these as involving ballasting, resleepering, rescue cranes, train control and "completion of rehabilitation."

In January 1988, at the SADCC annual consultative conference in Arusha, Tanzania, World Bank senior vice-president Edward Jaycox said the Bank might be interested in co-ordinating the project, and could fill in funding gaps.

A donors' conference held in Maputo in mid-1988 to raise funds for the second phase resulted in firm pledges of $60m (out of total estimated requirement of $228m), including $34.5m from USAID, $13.5m from West Germany, $3m from Botswana, $150,000 (in engineering services) from Portugal and $16.6m from Canada. Britain, which had contributed £14m to the the first phase, indicated its "continued commitment to the project," although it did not specify a sum to be donated. Other donors, including West Germany, showed interest in supporting the project.

A visit by Mozambican Foreign Affairs Minister Dr Pascoal Mocumbi to Brussels in early November 1988 was reported to have resulted in firm funding pledges by the European Community.

It appears likely, therefore, that funds for the complete rehabilitation of the line will be forthcoming. Once complete, this would in theory equip it to carry up to three million tonnes a year of cargo.

In mid-1988 two concerns predominated. One was short term: to secure the finance that would enable the NRZ to continue work between completing phase one and starting phase two, probably in April 1989. Possibly, as in the case of the NRZ's work on the Beira corridor, the Zimbabwe government will find resources of its own to allow the work to continue, and later secure compensation from donor sources (see Beira, Chapter Three).

The other concern is long term, and underlies all other current efforts.

Security

When the international group of engineers rode down the line in May, Figureueredo commented that they had noticed some timber sleepers burning after being set alight by Renamo rebels. Almost twice as long as the Beira corridor and rarely more than 100 km from the South African border at any point in its length, the Limpopo line is one of the most highly exposed and difficult to secure transport routes.

On the other hand, it is not surrounded by the same bush cover as the Beira route, which makes guerrilla attacks that much more difficult. Moreover, it would appear that, as in the case of Beira, the Zimbabwe army is going to make a substantial commitment to securing the line. Zimbabwean National Army troops rode down the line in mid-March 1988 to hit at the Renamo units in Gaza province which were believed to be responsible for killing seven railway workers and two militiamen days before in Zimbabwe. Since then, the Zimbabwe army, along with Mozambican troops, have been on the offensive in Gaza province for the first time, signalling the intention of the Zimbabwe government to keep the line secure.

Britain is also providing considerable "non-lethal military assistance" to help the projects it supports. Some £750,000 is to be spent on vehicles, communications systems and uniforms for troops guarding the Limpopo line. The UK is also training groups of 120 Mozambican soldiers at a time, for 16-week periods in Inyanga, Zimbabwe. The first group was deployed along the Limpopo corridor in January, and training will continue until March 1989.

According to British diplomatic sources, Thatcher's government hopes that the newly trained troops will be deployed along the Limpopo corridor, though this is not a requirement. The UK is also providing an armoured carriage worth £150,000 for use by Mott Hay and Anderson. The general prognosis is that, despite the odds, traffic will pick up on the Limpopo line.

Roads

At present there is no road link between Zimbabwe and the port of Maputo. Viewed as a highly desirable development, such a road would add considerably to the value of the Limpopo corridor and provide a road link between Zimbabwe and Swaziland which does not pass through South Africa. SADCC has prepared the terms of reference for such a project, and $0.4m is being sought for a feasibility study. But by mid-1988 no funding had been secured.

Swaziland-Maputo

Railway

Some 50% to 60% of the 78-km Goba line's capacity was still being lost in mid-1988, caused both by security problems and by non-sabotage derailments because of the bad condition of the line. Normally it would carry approximately 380,000 tonnes of sugar, 100,000 tonnes of pulp, 100,000 tonnes of coal and 1,000 to 1,500 containers of canned fruit each year.

But currently it handles approximately 200,000 tonnes of sugar, 10,000 tonnes of pulp and 80,000 tonnes of coal. All the canned fruit containers (300-400 a year) are transported by road. Some of Swaziland's cargo currently goes through Komatipoort, via a link built between Mapaka and Mananga, at costs considerably higher than on the Goba line. The balance goes through Richards Bay, also at a higher cost.

The South African master plan identifies 15 km of track on the Mpaka-Machava line linking Swaziland with Maputo as badly in need of repair, and budgets R3,538,000 for this.

A far more comprehensive scheme to rehabilitate the full length - 213 km - of the line from Machava in Mozambique to Matsapha in Swaziland is to be found in the SADCC plan. A feasibility study has been completed by the Italian consultants, **Sotecni**. SATCC is seeking a total of $60m (of which $18m will be in local finance) to rehabilitate the railway line on both sides of the border. The Italian government is likely to put up at least part of the money for this project.

The rehabilitation programme suggested by the consultants includes:

1. Renewal of the signalling and telecommunications installations on the entire Mozambican section of the line, along with work to rehabilitate the track (way and permanent way) on 33 km of line and the crossing loops of stations;
2. Rehabilitation of the track at the Mlawula border and Mlawula-Mpaka sections in Swaziland;
3. Rehabilitation work on the remaining part of the line in Mozambique;
4. The rehabilitation of both track and signalling installations on the remaining Phuzomoya-Matsapha section, and construction of a new electrical signal box in Mpaka station.

Security

If the work is to take off, the services of the British security firm, **Defence Systems Ltd (DSL)**, which is already employed on the Nacala route, will probably be considered. Meanwhile, CFM is introducing its own railway security officials along the line.

Road

Three SATCC projects aim to improve the state of the road linking Maputo with Swaziland (see Annex 2.2):

- Rehabilitation of the road from Maputo to the Swaziland border;
- Rehabilitation and upgrading of the road from Lomahasha via Siteki to Big Bend in Swaziland; Improvement of the Mbabane-Manzini road in Swaziland.

Total funding required is $71.9m, of which $19.5m had been secured by mid-1988.

South Africa-Maputo

Railway

The 88-km line linking South Africa to Maputo via Ressano Garcia is in fair condition. According to the South African master plan, it "does not require any specific attention beyond regular maintenance."

The main problems have been security related, especially since October 1987, after which the line was out of use up to 60% of the time.

This route, which once carried up to 7m tpa, currently carries some 1.5m tonnes made up principally of coal, sugar, citrus and steel from South Africa, Zimbabwe and Swaziland.

Some minor rehabilitation work is to be carried out by SATS, together with CFM: station-to-station communication between Ressano Garcia and Maputo is to be replaced and the central switching system at Matola reinstalled.

Security

The Ressano Garcia line, on which SATS frequently assists CFM with emergency repairs, highlights the contradiction between South Africa's support for Renamo and its own economic interests.

"A lot of people in Mozambique would say, why don't you just tell them to stop," says Beukes. "But it's not as easy as that because these people say they are independent. Whatever their motives are, it seems they are jeopardising trade between South Africa and Mozambique." If those economic interests become strong enough, South Africa will no doubt find a way of ensuring that more cargo passes through the route.

Meanwhile, there is talk in Maputo of DSL - "a viable third party" - being contracted to help protect the Ressano Garcia route as well. CFM has also introduced a special force, similar to that on the Goba line, along this route. In addition, it is understood that two battalion forces are to be deployed by the Mozambique government along the Komatipoort-Maputo corridor to help secure it.

Roads

The road linking South Africa with Maputo is also in good condition. Like the railway, it may have to undergo minor rehabilitation with some South African assistance.

The Harbour

Maputo is a tidal harbour at the head of Maputo bay, where the mouths of the Matola, Umbeluzi and Tembe rivers converge at latitude 25° 59' south and longitude 32° 36' east. The approach to the harbour comprises 80 km of channels. Two channels merge into the Xefina channel, and then the Polana channel. The overall designed, least-dredged depth of the channels is 9.4 metres, which will take ships of 10 metre draught.

However, after 1980, the channels began to silt up and deteriorate. This caused the closure of the southern channel, while depth in the north and Xefina channels was reduced to 6.5 or 7 metres. This limited vessels using the port to seven or eight metre draught, or around 25,000 tonnes.

Dredging

Emergency dredging is one of the projects listed in the South African master plan, but the initiative has been taken by the Mozambican government.

Starting in July 1987, a Mozambican company, **Emodraga**, with some Dutch technical assistance, has been using a dredger called *The Rovuma* to restore channel depths. In May 1988, the channel was down to a 7.4 metre depth and work was continuing. At 9.4 metres, the harbour will be able to handle vessels of 60,000 tonnes.

The SATCC has launched an appeal for $1.7m (of which $0.3m is in local currency, and has been secured) for a feasibility study on improving the channel to permit the passage of large vessels to the Matola terminal on normal tides, and of container vessels to the Maputo container wharf at all tides.

Buoyage

Both the South African plan and SADCC (although this is not listed under the Maputo transport system projects) identify the need to increase safety of navigation in Maputo by restoring lights and buoys.

Sweden has granted $7.9m which will completely renew the bouyage. The first phase involves emergency rehabilitation of existing buoys (three have been completed) and ultimate replacement of 18 of the 23 buoys with new ones. A buoy maintenance depot is included in the deal. Meanwhile, Denmark has put up $7.2m to supply a buoy-working vessel to maintain, lift and replace navigational buoys.

Pilotage

This is compulsory, and is provided by 8-10 Russian pilots, provided through Russian bilateral aid to Mozambique.

Marine management

This includes a harbour master and marine engineer, provided by Portia under a contract with the UK's ODA. The aim is to improve the maritime services of the port.

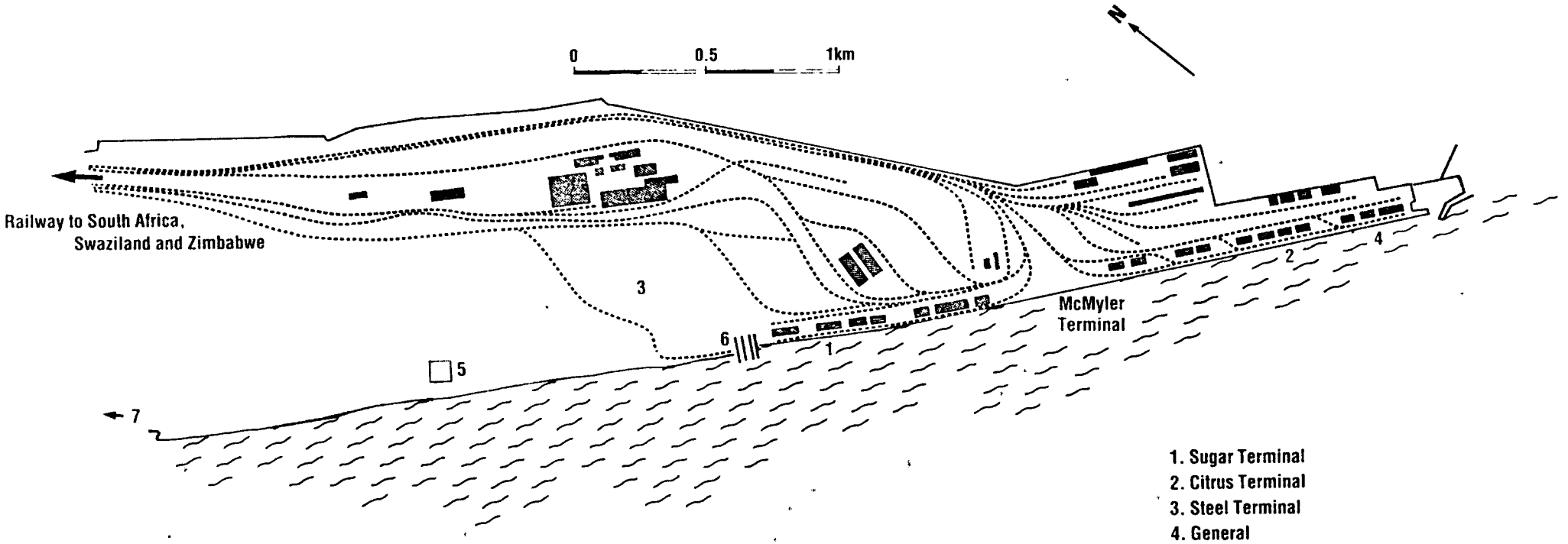
The Port

The port of Maputo has three principal functions: coastal; general cargo (national and international); and providing specialised handling facilities (see map).

Coastal

This serves the internal cargo of Mozambique, with services to Maputo, Beira, Nacala, Pemba, Quelimane and

Maputo Port



1. Sugar Terminal
2. Citrus Terminal
3. Steel Terminal
4. General
5. Container Terminal
6. Rocon Bulk Loading
7. Matola Wharf (upstream)

Inhambane. Because Mozambique's security problems, the coastal service is vital for distributing emergency food relief.

Recently, as part of a bilateral aid programme with Norway, the coastal area underwent major rehabilitation of its quays, sheds, and open storage area. What used to be a "wasteland of dilapidated quays and sheds" has been turned into "one of our showpieces", says Portia's Neil Young. Norway is also providing managerial assistance and spares to the Mozambican shipping company, **Navique**, which operates up and down the coast.

General cargo

Berths B to I - some 3,000 metres of quay space - are designated for general cargo. This is mainly made up of imports, principally food aid to Mozambique (about 0.25m tpa) and some exports, such as asbestos.

The area is serviced by 54 cranes; 25 were operational in June 1988; 12 MAN cranes are being rehabilitated with technical assistance from West Germany. There are 14 five-tonne forklifts, all of which were operational in June 1988, as well as six shunting tractors, four of which were operational. Ten shunting locos are available, and the service is quite adequate. The area is also serviced by five tugs; a further eight are expected to arrive from Italy shortly.

Italy is also providing some $5m to rehabilitate all the quay faces of berths B to G - including recementing, repaving and strengthening. A similar proposal is in the South African plan.

Since January 1988, Italy has provided an eleven-member technical team to assist with the general management of berths B to G. These include two general cargo ship co-ordinators; the rest are involved in workshop repairs and crane maintenance.

The I Zone, with a quay lenth of 440 metres, has a special berth for large carriers drawing up to 40,000 dwt. The South African technical company, **TMS**, refurbished the five cranes of five tonnes and 23-27 metre reach, and is now assisting with maintenance and management of the I zone.

Specialised handling facilities

The container terminal:
A major SADCC project, the container terminal at Maputo port recently became operational. It is now the most modern in Southern Africa.

Italian finance enabled the construction of the terminal, most of which was done by Italian firms. The terminal is managed with the assistance of a 14-member team provided by Portia.

The terminal has 300 metres of berthing space, and is equipped with two modern gantry cranes with fully automatic telescopic spreaders. These can load and discharge 35-tonne lifts of containers between six and 12 metres. With a 360-degree rotation, the cranes are versatile and mobile under all conditions; with the spreaders removed, they can lift 40 tonnes under hook. Each gantry can handle 42,000 lifts a year.

Landside equipment at the terminal currently includes nine 20-tonne forklift trucks, five with toplift spreaders, and a fleet of internal movement vehicles. **Manica-Mozambique** recently acquired a heavy forklift to handle 12-metre containers in the port area. The only recommendation in the South African master plan for the container terminal is that R3.5m be allocated for additional mobile equipment.

The container terminal has a storage capacity of 70,000 sq metres, with an annual throughput capacity of 25,000 TEUs. A container freight station has been installed to stuff and strip FCL and LCL containers and has covered storage for this cargo. Productivity - measured by the terminal's loading rates - is regarded as equal to, possibly even superior to, Durban's.

The latest addition to the container terminal is a RoCon facility which puts Maputo ahead of its South African counterparts and diversifies the use of the container terminal.

A R2m joint venture between CFM and **Aurora International Investments**, the system handles bulk materials via high-capacity container gantry cranes. Bulk materials are loaded into open-top containers from the port dumpsite or ex-rail. They are then soft-loaded into the vessel's hold at a rate of 500 tonnes per hour via gantry cranes.

The sugar terminal:
This facility was built in 1965 and comprises three storage sheds with capacity for 140,000 tonnes. Each shed has conveyor systems of 150 metres to supply two shiploaders. Wagons are emptied by overhead cranes with grabs. The offloading system handles six to eight wagons an hour. Average loading rates equal 550 tonnes per hour.

As sugar is a seasonal product from April to mid-December, the quay in front of the sugar terminal is idle for the rest of the year, and five shore cranes are used to handle general cargo products.

In present circumstances the facility can handle over 500,000 tpa of sugar, but in 1986 this was down to 377,000 tonnes due to lower Swazi usage. Portia provides management assistance, and the facility is maintained by a team of South African technicians. The South African master plan allocates a small R3.399m (£0.78m) expenditure for rehabilitation of the facility.

The steel terminal:
This facility covers two quays of 165 and 175 metres, respectively. Both have a 12-metre draft, and are served by four 20-tonne cranes with 26.5-metre booms. There are four 20-tonne mobile forklifts.

The terminal has a storage capacity of 50,000 square metres and a handling capacity of 900,000 tpa. In 1987 the facility handled 140,000 tonnes, mostly of Zimbabwean steel. Loading rates are 2,000 to 2,500 tonnes per day. The terminal is managed with assistance from Portia Management Services, UK.

The South African master plan makes provision of R8.175m (£1.9m) for rehabilitation of this facility, but says that no capital expenditure should be embarked on until exporters make commitments that warrant the expansion.

The citrus terminal:
This comprises 380 metres of quay, with five wharf cranes in full operation. The citrus is stored in two cold-stores which can take 500,000 cases.

Also associated with the facility are molasses tanks with a 33,000-tonne storage capacity, used mainly by the Swaziland Sugar Association. During the off-seasons for fruit and sugar the quay is used for general cargo. The citrus terminal currently handles some 480,000 tpa - mostly from South Africa (£0.97m). The facility is managed with techincal assistance from South Africa.

The master plan provides for a R4.235m refurbishing - structural, mechanical and electrical - which includes the wharf cranes (West German aid covers part of this) and modernisation of the refrigeration system in the old shed.

Matola minerals wharf:
The Matola minerals terminal adjoining Maputo port has a berth 210 metres long and can load 40,000 dwt ships at a daily rate of 7,500 tonnes. It was built in 1963, designed to cope with throughput of 6m tpa of ore. Recently, due to depletion of iron ore reserves in Swaziland, the terminal has been used by coal exporters.

The conveyor system has now been completely refurbished by the South African company TMS, at a cost of R2.2m, provided as a soft loan to Mozambique by South Africa. This project appears both in the master plan and in the SADCC project document, where funds are reported to have been raised by Mozambique (see Annex 2.2).

The facility can handle 1.5m tpa at present (it handled 793,000 tonnes, of mostly South African coal, in 1986), and is also managed with assistance from TMS.

The terminal has four rows of stockpiles and is equipped with tipplers, stacker-reclaimers, ship loaders and an extensive conveyor system. The two tipplers are of the roadside type. Each has a rated capacity of 20 wagons per hour, with gross weight of up to 90 tonnes.

The conveyors from the stockpile have an average flow rate of 800 tonnes per hour each. The wharf conveyors are installed in an elevated gallery along the quay and feed the two shiploaders, having a boom reach of 21.3 metres.

Both the SADCC project document and the master plan identify programmes to expand the capacity of the facility: SADDC envisages three phases which would increase the capacity to 7m tpa at a cost of $89m, while the master plan outlines two phases to raise capacity to 4.25m tpa at a cost of R33.935m ($13.86m). Both are contingent on increased demand. Therefore neither has yet raised the funds.

The McMyller coal-tippling appliance:
This has a boom length of 21 metres fully extended, and 18 metres retracted. The facility has recently been completely refurbished by TMS at a cost of R640,000, as part the master plan's phase one. TMS now helps with management of the facility. Throughput capacity is 0.5m tpa, with loading rates of 400 tonnes per hour.

Note: As well as the six existing specialised handling facilities, the master plan contains a proposal for a R9.460m facility to increase the port's storage capacity for ferrochrome and chrome. It also proposes a R34.568m "multi-product berth," depending on whether the necessary export tonnage can be drummed up. Unlike the SADCC project proposal, the master plan lists in detail other developments required at the port: general reticulation (power and drainage, communications and water reticulation), workshops, a foundry and stores, as well as accommodation - see the summary of costs in Annex 2.3. These would also largely depend on traffic through the port picking up.

Training

Technical assistance provided to manage the port has been mentioned under the various sections above. Although this is not listed under SADCC's Maputo port transport system proposal, the Norwegian government is to provide $5.8m (to which the Mozambican government will add $1m in local currency) for a port staff training institute in Maputo.

This project is part of a larger SADCC inventory on the needs for formal port training in its different member countries. In Mozambique, 540 individuals per year are to receive such training over a ten-year period. The institute is currently accommodated in existing port buildings while construction of a new school and rehabilitation of dormitories takes place.

Shipping services

Maputo is principally serviced by the South Africa Europe Container Service (SAECS), while the balance is mainly charter vessels.

Annex 2.1

Mozambique port and railway authorities

All ports and railways in Mozambique come under the administration of the National Directorate of Ports and Railways, known by its Portuguese acronym DNPFC, which in turn falls under the Ministry of Transport. This is further sub-divided into six units, the largest of which are CFM South (Maputo port transport system), CFM Centre (Beira transport system) and CFM North (Nacala transport system). The following chart illustrates this structure, as well as providing the addresses of key contacts.

The following are names and addresses of personnel involved in providing technical and managerial assistance:

Neil Young, Project Manager, Portia Management Services Ltd; Phone: 34270, Maputo; address, same as for port.

Reg Masters, Project Director, Mott Hay and Anderson International Ltd, Brigada de Melhoramentos do Sul, Av Martires de Inhaminga 424-2 Andar, CP 1291, Maputo, Mozambique; Phone: 32690; Telex: 6614 BMS Mo, 6208 CFMS MO, Maputo.

Caminhos de Ferro de Mocambique (CFM - Mozambique Railways)

NATIONAL

F Ferreira Mendes - Nat. Director
L. Ah Hoy - Dep. Nat. Director
R. Fonseca - Dep. Nat. Director
J. Stephens - Comm. & Marketing Manager
Telex: 6438; Tel: 30151 26019; P O Box 2176,

C.F.M. - SUL

I. Diniz - C.F.M. Sul Director and Maputo Port Director
M. Dimande - Deputy Director and Railway Director
J. Young - Maputo Port Advisor (Portia Mgt. Services)
Telex: 6208; Tel: 27173; P O Box 2158, Maputo.

C.F.M. - CENTRO

G. Mabunda - C.F.M. Centro Director and Beira Port Director
O. Diniz - Deputy Director
N. Hollaar - C.F.M. Centro/APC Commercial Advisor
Telex: 7439; Tel: 78111/2; P O Box 472, Beira.

C.F.M. - NORD

R. Perreira - Director - Railway Director
C. Bambo - Nacala Port Director
B. Halpin - Railway Advisor (Mott Hay & Anderson)
P O Box 16, Nampula.

Source: BCG, Harare

Principal CFM agents in Mozambique

AMI-Mozambique, P O Box 72, Beira, Mozambique. Tel: 24001; Telex: 7-331, 7-422; branch offices in Maputo and Nacala.
Anfrena, P OBox 1430, Maputo, Mozambique. Tel: 21084; Telex: 6-518, 6-570; branch offices in Beira, Nacala, Pemba, Quelimane and Inhambane.
Manica Mozambique, P O Box 292, Maputo, Mozambique. Tel: 25041; Telex: 6-512; branch offices in Beira and Nacala.

CFM contacts in the region

CFM-Commercial Department, P O Box 276, Maputo, Mozambique. Tel: 27173, 24228; Telex: 6-208, 6-438.
CFM-Zimbabwe, Livingstone House, Samora Machel Ave, Harare, Zimbabwe. Tel: 734775; Telex: 6383.
CFM-Swaziland. Tel: 43285; Telex: 2251.
CFM-Malawi, Malawi Railways, Limbe, Malawi. Tel: 640844 ext. 327; Telex: 4810.
CFM-South Africa, 111 Commissioner St, Johannesburg, South Africa. Tel: 337-7826; Telex: 4-83999.

Annex 2.2
Maputo Port Transport System projects (all amounts in $ million)

Project no.	Project title	Estimated cost Total	Foreign	Local	Funding secure Amount/Source	Funding under negotiation Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
ROADS										
1.3.1	Upgrading of the road Mohales Hoek-Quthing-Qachas Nek, Lesotho	89.0	81.0	8.0	8.0 Lesotho 15.0 (EEC) 34.0 (USA)	0.0	32.0	1985	4 years	Ongoing. The EEC and USA have been approached for financing the shortfall.
1.3.2	Upgrading and reconstruction of the road Taung-Mokhotlong-Sani Top, Lesotho	35.7	28.5	7.2	7.2 Lesotho	0.0	28.5	1988	3 years	Feasibility study and engineering design are completed (financed by UK). EEC has been approached for implementation.
1.3.3	Upgrading of the road Thaba Tseka-Taung-Mpiti, Lesotho	35.7	28.5	7.2	7.2 Lesotho	0.0	28.5	1988	4 years	Feasibility study financed by Canada has been completed.
1.3.4.	Construction of a New Road Ramabanta-Semonkong Sekake, Lesotho	36.8	29.4	7.4	7.4 Lesotho	0.0	29.4	1990	3 years	Engineering design of the Ramabanta--Semonkong section completed financed by F.R. Germany which has been approached for financing of works.
1.3.5	Upgrading of the road Mokhotlong-Oxbow, Lesotho	26.5	21.2	5.3	5.3 Lesotho	10.0 (BADEA)	11.2	1989	3 years	Design has been completed.
1.5.4	REhabilitation of the road Maputo - Swaziland border, Mozambique	21.0	17.0	4.0	0.5 (Sweden) 4.0 (Mozambique)	16.5	0.0	1987	4 years	Works on the Matola Bridge about to start. Engineering design for the road yet to be carried out.
1.5.6	Study of a new road linking southern Zimbabwe with the Maputo area	0.4	0.4	0.0	0.0	0.0	0.4	1988	8 months	
1.6.1	Rehabilitation/upgrading of the road Mozambique border at Lomahasha-Siteki-Big Bend	22.0	18.7	3.3	5.7 (ADB) 3.2 (Sweden) 3.3 (Swaziland)	0.0	9.8	1992	2 years	Work completed on the Lomahasha-Siteki section. Financing is being sought for Siteki-Big Bend section.
1.6.2	Improvement of the Mbabane-Manzini road, Swaziland	28.9	23.1	5.8	5.8 (Swaziland)	0.0	23.1	1989	2 years	
RAILWAY LINES										
2.2.1	Rehabilitation of the main railway line, Botswana	114.0	91.0	23.0	18.0 (PR China) 23.0 (Botswana)	0.0	73.0	1984	9 years	See phasing of project below.
(01)	Section 1: Gaborone to southern border	19.0	15.0	4.0	15.0 (PR China) 4.0 Botswana	0.0	0.0			
(02)	Section 2: Francistown to the northern border	15.0	12.0	3.0	3.0 (PR China) 3.0 (Botswana)	0.0	9.0			Canada financing study on sect. 2 and 3 under project 0.0.5, USD 0.15m, and was approached for funding implementation.
(03)	Section 3: Gaborone to Francistown	80.0	64.0	16.0	16.0 Botrswana	0.0	64.0			See note for section 2 above.

Project no.	Project title	Estimated cost Total	Foreign	Local	Secured funding Amount/Source	Funding under negotiaton Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
2.2.2	Rehabilitation of railway telecoms facilities, Botswana	4.1	4.1	0.0	4.1 (Sweden)	0.0	0.0	1986	2.5 years	Work commenced in 1986.
2.2.4	Renewal of the train working system, Botswana	5.0	4.7	0.3	4.7 (Sweden) 0.3 (Botswana)	0.0	0.0	1987	2 years	Work commenced in 1986.
2.2.6	Procurement of railway rolling stock, Botswana Railways	18.5	18.5	0.0	0.0	0.0	18.5	1988	2 years	DANIDA and Japan have been approached.
2.2.8	Exchange yard for Botswana Railways at Rakhuna	1.6	1.2	0.4	0.4 Botswana	0.0	1.2	1987	1 year	Contingency plan.
2.3.2	Expansion of oil storage facilities, Lesotho	5.8	5.8	0.0	0.0	0.0	5.8	1988	2 years	
2.5.1	#Rehabilitation of the Mozambique-Swaziland Railway	60.9	42.9	18.0	11.9	0.0	49.0			
(01)	Feasibility study of the Machava - Swaziland Railway	0.9	0.9	0.0	0.9 (Italy)	0.0	0.0	1985	2 years	Study completed.
(02)	Rahabilitation of the Machava - Swaziland Railway, Machava - Swaziland border	23.0	16.0	7.0	0.0	0.0	23.0	1988	3 years	Italy has been approached for funding the implementation.
(03)	Rehabilitation of the Machava - Swaziland Railway, Matsapa - Mozambique border	37.0	20.0	11.0	11.0 (Swaziland)	0.0	26	1988	3 years	Italy has been approached for funding the implementation.
2.5.6	Railways in southern Mozambique	0.0	0.0	0.0	0.0	0.0	0.0			See phasing of project.
(02)	#Study on engineering for bridges on railways in southern Mozambique	0.4	0.4	0.0	0.4 (Canada)	0.0	0.0	1988	9 months	Financed under Project 0.0.5.
(03)	#Rehabilitation of Maputo - Chicualacuala railway	130.0	97.5	32.5	27.0	0.0	103.0			
(031)	Phase 1: Operations study, rehabilitation, welding plant, communications etc.	27.0	25.0	2.0	25.0 (UK) 2.0 (Mozambique)	0.0	0.0	1986	10 years	Work has commenced. A project description has been prepared for all 3 phases.
(032)	Phase 2: Ballasting/-resleepering (400 km), rescue cranes, train control.	60.0	43.0	17.0	0.0 Mozambique	0.0	60.0			Discussions with several potential financers in progress.
(033)	Phase 3: Completion of rehabilitation	43.0	39.0	4.0	0.0	0.0	43.0			
(04)	#Motive power, rolling stock and operations plan for CFM(S)	0.3	0.3	0.0	0.3 (Canada)	0.0	0.0	1987	4 months	To be financed under project 0.0.5.

Project no.	Project title	Estimated cost Total	Foreign	Local	Secured Funding Amount/Source	Funding Under negotiation Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
2.6.1	Modifications of wagons and wagon maintenance, Swaziland Railway	1.2	0.9	0.3	0.3 Swaziland	0.0	0.9	1988	3 years	Denmark has been approached.
PORTS										
3.5.1	#Maputo Port, Mozambique	121.0	115.2	5.8	9.0 (Italy) 1.8 (UK) 5.8 Mozambique	0.0	104.4	1984	7 years	Estimates of costs and funding represent the total of the sub-projects listed below.
(01)	Feasibility study on improvement of the entrance channel to Maputo Port	1.7	1.4	0.3	0.3 Mozambique	0.0	1.4	1988	2 years	Dredging of existing channel to 9.4 m started July '87, completion June '88.
(021)	Matola coal terminal-phase 1	1.3	0.0	1.3	1.3 Mozambique	0.0	0.0			Rehabilitation work completed March 1987. Further investment depending on increase in traffic.
(022)	Matola coal terminal-phase 2	9.0	9.0	0.0	0.0	0.0	9.0			Depending on increase in traffic.
(023)	Matola coal terminal-phase 3	80.0	80.0	0.0	0.0	0.0	80.0			Depending on increase in traffic.
(03)	Container terminal equipment and management assistance	29.0	24.8	4.2	9.0 (Italy) 1.8 (UK) 4.2 Mozambique	0.0	14.0			A $9m Italian credit for cranes and other equipment. UK financing the management assist. scheme over three years, to Sept. 1987, to be extended for another two years.
	TOTAL	**758.1**	**639.1**	**119.0**	**212.9**	**10.0**	**532.2**			

The costs associated with this entry are not directly included in the totals. They appear either under another project or as costs for sub-projects.
() Brackets around a country or financing agency indicates a foreign exchange contribution.
Source: SATCC, January 1988.

Annex 2.3

Summary of the Masterplan for the Rehabilitation of Maputo Port prepared for DFM and the SAFTO Maputo Port Working Group

(thousand rand)

Project	Estimated Cost
A. **Trackwork and rail network**	
Track Mpala (Swaziland)-Machava (SADCC overlap)	3,538
Machava Yard (Italian aid)	2,734
Maputo	15,166
Matola	1,224
Centralised traffic control	1,000
B. **Roads in harbour areas**	
Matola	407
Maputo	375
C. **Harbour marine**	
Study on dredging requirements (SADCC overlap)	7,240
Buoys (Swedish aid)	1,080
Repairs to Quay (Italian aid)	3,892
D. **General reticulation**	
Power distribution - Matola	2,700
Maputo	1,300
Drainage - Matola	591
Maputo	2,265
Communication - Matola	67
Maputo	337
Traffic data processing	1,418
E. **Workshops, foundry and stores**	
Railway workshops	500
Harbour workshops	800
F. **Accommodation**	
Harbour offices for managers	300
Accommodation for managers	650
Project office	500
G. **General cargo berth**	5,088
H. **Specialised facilities**	
Steel	8,175
Sugar	3,339
Container	3,500
Multiproduct terminal (new)	34,658
Matola I (TMS-complete)	2,200
Matola II (SADCC overlap)	5,430
Matola III (SADCC overlap)	28,505
Mc Myller (TMS-done)	640
Ferro chrome (new)	9,460
Citrus	4,253
TOTAL	153,332

Chapter Three

The Beira Port Transport System

Never the best of ports, Beira has nonetheless been the most high profile of SADCC's transport projects. As such, in the words of BCG chairman Denis Norman, the port has been "subject to much information, much more misinformation, a tremendous amount of speculation, and total confusion." Despite the problems - not all of them technical - Beira is beginning to take shape, and holds considerable promise for the future.

Located in the central Mozambican province of Sofala, Beira is the nearest port for northern Zimbabwe, southern Malawi and southern Zambia (which has only a continuous road link to the port, though a rail link with the Zimbabwe system is under discussion).

However, the ports access route from Zimbabwe cuts through mountainous terrain and the port itself has to be artificially dredged to stay open. As such, even in colonial times, Beira was used as a port of entry for smaller shipments, while Maputo handled bulk consignments.

At its peak in 1974, Beira handled four million tonnes of cargo. Thereafter, as in the case of Maputo, throughput started to decline as a result of the closure of the border with Rhodesia after Mozambique became independent in 1975. Following Zimbabwe's independence in 1980, traffic began to pick up once more, notably on the imports side (see Table 3.1) as the country once more began to use the Lonrho-owned oil pipeline from Beira to the eastern border town of Mutare for its oil imports.

The pipeline was indeed to be the key to the port's future. By the mid-1980s, the Chicualacuala, Beira-Malawi, and Nacala-Malawi railways had been closed as a result of Renamo sabotage. But, as the port of entry for most of Zimbabwe's fuel, Zimbabwean troops were stationed along the Beira-Zimbabwe corridor in 1983. These forces were beefed up considerably in 1985 when, at the peak of calls for sanctions against South Africa, coupled with threats of counter-sanctions, Zimbabwe made a more definite commitment to securing the corridor and helping Mozambique with the war effort.

At the same time, because of the change in political climate, Western donors and businessmen began to take an interest in the port.

In 1986, SADCC put together a comprehensive $614.6m ten-year plan for the port (see Annex 3.1) which previously only the Dutch government had taken an interest in. At two donor conferences that year, some 90%

Table 3.1

Beira Port throughput *(tonnes)*

	1980	1981	1982	1983	1984	1985	1986	1987
TOTAL	**1,520,000**	**1,655,700**	**1,628,000**	**1,605,800**	**1,377,800**	**1,385,100**	**1,328,200**	**1,947,500**
Cabotage								
In	92,600	109,900	175,700	176,600	161,500	110,000	84,700	132,800
Out	150,400	155,900	138,600	205,000	104,000	76,500	70,400	122,100
Moz trade								
Exports	362,600	314,100	194,100	64,600	56,700	56,300	61,700	40,100
Imports	361,000	390,900	334,900	324,100	288,000	292,000	383,100	292,000
Transit exports								
S Africa	-	-	-	-	-	-	-	-
Swaziland	-	-	-	-	-	-	-	-
Zimbabwe	5,100	65,900	96,400	126,300	45,200	89,000	65,400	161,100
Malawi	239,400	235,600	134,800	37,200	34,400	56,100	3,200	63,100
Others	300	2,800	-	-	-	-	3,000	88,600
Transit imports								
S Africa	-	-	-	-	-	-	-	-
Swaziland	-	-	-	-	-	-	-	-
Zimbabwe	15,200	59,200	262,100	609,000	686,700	699,000	655,300	1,042,400

of the $200m deemed necessary for the first half of the plan were raised, and the Mozambique government hurriedly set up the Beira Corridor Authority, headed by engineer Rui Fonseca, to manage and co-ordinate the project.

Meanwhile, to facilitate private sector involvement in such areas as the construction of special handling facilities, services and utilities, two independent companies were formed: the **Beira Corridor Group**, which was oversubscribed at its initial launching in Harare, and the **Empresa Austral de Desenvolvimento** in Mozambique (see Organigram on p23).

Initial work on the port involved a first phase "emergency" operation to restore the port to its 1975 capacity of three million tonnes. This included a Dutch-funded dredging operation, to bring the level of the harbour down to its normal -6m, and emergency repairs on the Mutare-Beira railway line, undertaken largely and most efficiently by the National Railways of Zimbabwe. Although, for security reasons, work never took off on the Malawi-Beira corridor, the Mutare-Beira line could be used for Malawi cargo coming by road to Harare, through the Mozambique province of Tete.

Yet throughput in 1986 was actually slightly below that for 1985, a fact attributed by the Mozambicans to the reticence of white Zimbabwean businessmen. "This scenario, this pattern of continuing to use South African ports must change," Fonseca told a group of 34 Zimbabwean businessmen who toured the port in March 1987.

Admittedly, psychological barriers did exist. However, there were also a host of practical problems. For a start, the port still needed to undergo numerous qualitative changes, contained in the second part of the five-year plan, including the reconstruction of berths, construction of a permanent container terminal and rehabilitation of handling equipment.

The port had also suffered from a loss of skilled personnel. Management was strengthened by the arrival of a team of ten from the **Amsterdam Port Consultants** (APC) group, part of the Amsterdam harbour authority.

Initially, there was also very little cost advantage to using the port, because of the high premiums charged by shipping lines calling at Beira. That changed in January 1987, when the **South Africa Europe Container Service** (SAECS), the main conference line servicing Beira, aligned the port's seafreight rates with those of its South African competitors, restoring Beira's natural cost advantage - an average of $400 per tonne less than through Durban, which is three times the distance from Harare.

Though still considered inadequate, shipping services began to increase (see details on p31).

Procedures have also been made easier. In May 1987, shipping agents in Zimbabwe and Mozambique agreed to establish a through bill of lading for importers and exporters through Beira. Revised documentation procedures have also been agreed to and the **Zimbabwe Credit Insurance Corporation** has agreed to offer war risk transit cover on all exports, including those through the Beira Corridor.

In 1987, traffic through Beira showed a 31.7% increase and came to just under two million tonnes. Part of this was due to political commitments made to use the port: Sweden, for example, decreed that all its exports to the region would have to pass through Beira, while Zambia (see Chapter 5) decided that 20% of all its copper exports (about 1,200 tonnes a month) would go through Beira.

But about half of the throughput was Zimbabwean cargo, voluntarily sent through the port by businessmen. All told, Beira handled approximately one-quarter of Zimbabwe's overseas trade of about four million tonnes.

Although oil imports (approximately 650,000 tonnes)

Table 3.2
Shipping Services to Beira

400 ships called at Beira during 1987, 129 of which were liners. The Ro-Ro calls about every 21 days.

The following table shows the types of vessel calling by month:

	Tankers	Charters	Coasters	Trawlers	Liners	Spacial
January	5	3	6	1	11	-
February	5	6	10	-	5	-
March	7	1	14	-	10	2
April	7	5	13	-	10	1
May	9	3	10	1	11	-
June	3	3	13	1	14	1
July	6	5	11	-	10	1
August	5	8	12	1	12	1
September	9	4	10	1	6	1
October	7	4	8	1	19	2
November	8	4	9	-	9	1
December	7	5	6	2	12	2
TOTAL	78	51	122	8	129	12

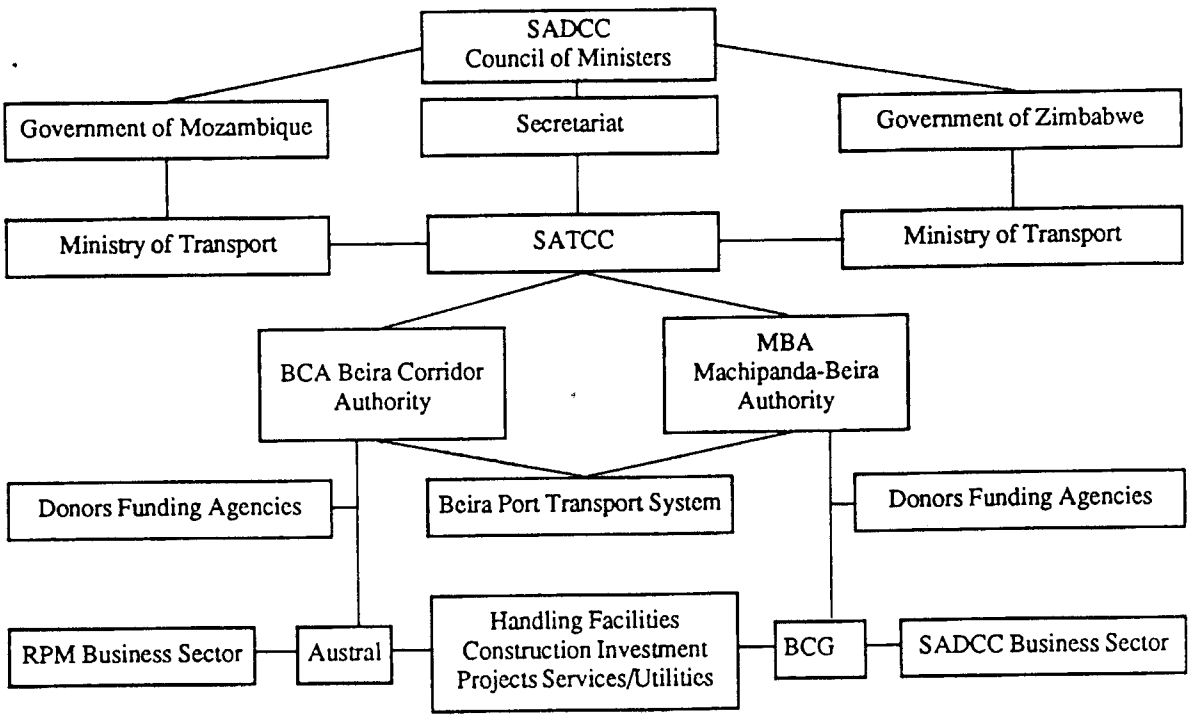
Lines presently calling at Beira include SAECS Conference lines, Mitsui OSK, Shipping Corporation of India, Indian Ocean Shipping Lines, Lykes Lines, Nippon Yusen Kaisha, Gold Star Line, Besta Line, Port Line, Zim Lines and DSR Lines.

Destinations served on a regular basis are Northern Europe, Japan, India, the southern US, USSR, East African coast.

An important service still awaited is to the Mediterranean. Medite could graft a bi-monthly call at Beira onto its existing network but awaits a more consistent flow of cargo. In the meantime traffic to the Mediterranean is trans-shipped in Durban or Mombasa.

Source: BCG

Organigram of Beira Corridor Project



Source: BCG

continued to account for the largest percentage of Zimbabwe's traffic, cotton, tobacco, tea, asbestos and coffee exports, and fertiliser and plastic imports showed an appreciable increase.

Indeed, the port very nearly suffered another set-back at the end of 1987 when the arrival of a large consignment of Zimbabwean goods coincided with floods and various operational problems at the port, leading to serious congestion.

Alarm bells started sounding when BCG managing director Eddie Cross told a local reporter that Zimbabwean businessmen were turning back to South Africa, and the Harare business weekly *Financial Gazette* reported that three shipping companies had threatened to pull out of the port.

Charges and counter-charges once more crossed borders, with Fonseca declaring that "some people who still have their minds on the south will clap their hands if we fail, but we will not fail."

Some of the charges made by the BCG were exaggerated. For example, although it is true that as a result of the floods and the absence of the *Rovuma* dredger, which was at work in Maputo, the channel began to silt up, 25,000 tonne ships still continued to use the port as before. The final phase of work on Beira port involves further dredging to -9 metres, and was due to start in the latter half of 1988.

At the same time, as will be seen in the detailed description below, the Mozambican construction company working in the port is about a year behind in its work on the temporary container terminal and repaving of four berths.

The private sector is also behind in the projects that it has proposed to embark on, partly because of long bureaucratic delays.

Fundamentally, there remains a certain amount of distrust between Mozambican authorities - plagued with problems such as low labour productivity, frequent delays in supplies and disruptions to services - and white Zimbabwean businessmen whom they see as arrogant and sometimes patronising. Personality clashes between the BCA and BCG are also plainly evident. Both sides are also accused by businessmen of being over-enthusiastic, and inflating expectations.

But both sides share an interest in seeing the port work: the Zimbabweans, because use of Beira port could mean savings of anything up to $60m a year in foreign currency, and the Mozambicans because they badly need the port revenues if the country's economic reform programme is to work.

At a political level, Zimbabwe and Mozambique share particularly close ties which have guaranteed close coordination on the Beira project at the highest level. Soon after the end of year controversy, for example, Zimbabwe's President Robert Mugabe instructed one of his new senior aides Chris Ushewekunze - well known for his efficiency as former permanent secretary in the Ministry of Mines - to give him a weekly briefing on the situation in Beira.

Significantly, traffic through the port, which had dropped to 114,937 tonnes in January, was back up to 159,688 tonnes in February, and the Minerals Marketing

Corporation of Zimbabwe has since reported the highly successful handling of two trial shipments of containerised minerals through the port.

The Mozambican authorities revived the Beira Port Advisory Committee to increase the flow of information between interested parties. This comprises government officials, chief executives of parastatals, chambers of commerce and industry, as well as officials of the BCG from Botswana, Malawi, Mozambique, Zambia and Zimbabwe. All users of the port are welcome to attend the committee's meetings.

Following the acrimony in late 1987, officials of both the BCA and BCG agreed that until 1990 - while major reconstruction work is taking place on berths two to five - it would not be wise to increase cargo through the port much beyond its 1987 level. Thereafter, throughput should easily reach three million tonnes, climbing to even as high as five million tonnes.

The chairman of the Zimbabwe Shipping and Forwarding Association, Rhett Hill, made an appraisal visit to Beira in September 1988. Among his observations were the following:

- Four new container forklifts were due to arrive in September, two of which would be able to handle 40-foot containers.
- A Swedish company was working on introducing a computerised container tracking system, where containers will be stored and stacked according to their destinations.
- The loading of import containers was very quick, with containers being loaded onto rail and dispatched to Zimbabwe within an average of five to six days after discharge.
- A Dutch dredging company (**Boskalis**) had set up operations and actual dredging programmes were expected to start by the end of the year (see Dredging, below).
- The serious accommodation shortage in Beira would soon be eased with the completion of several new houses and flats to cater for the various expatriate teams working in the port.
- Rehabilitation work in the port area was progressing fast, with Berth 9 and the access from it to the temporary container park almost completed. About 80% of the refurbishment on the container park itself was complete. Work was continuing on Berth 10 and due to be completed soon.
- He estimated that 30-35% of Zimbabwe's import and export cargo was currently being handled through Beira, compared to 10% 12 months previously. And the volume of traffic through South Africa had been reduced from about 80% to 65-70%.

The third phase - the last five years of the plan - comprises ancilliary projects defined as "projects which are considered to be necessary and economically viable, but whose implementation can be postponed beyond 1990 without any risk of any harmful effects."

That the port has shown an improvement even in these initial stages is a positive sign. As Fonseca puts it: "This shows effort, it shows organisation. This is something that must be respected."

The Access Routes

The port of Beira is linked to Zimbabwe, Zambia and Malawi by a fairly extensive network of roads and railways, all of which were in need of, or still are in need of extensive repair. The port also boasts an oil pipeline to Mutare in Zimbabwe, and there are plans to extend this to Harare, with the hope that it will service the SADCC region more fully from this more central point.

Zimbabwe-Beira

The three links between Machipanda and Beira (a distance of 314 km) constitute what has come to be known as the Beira Corridor. They are:

The Railway Line

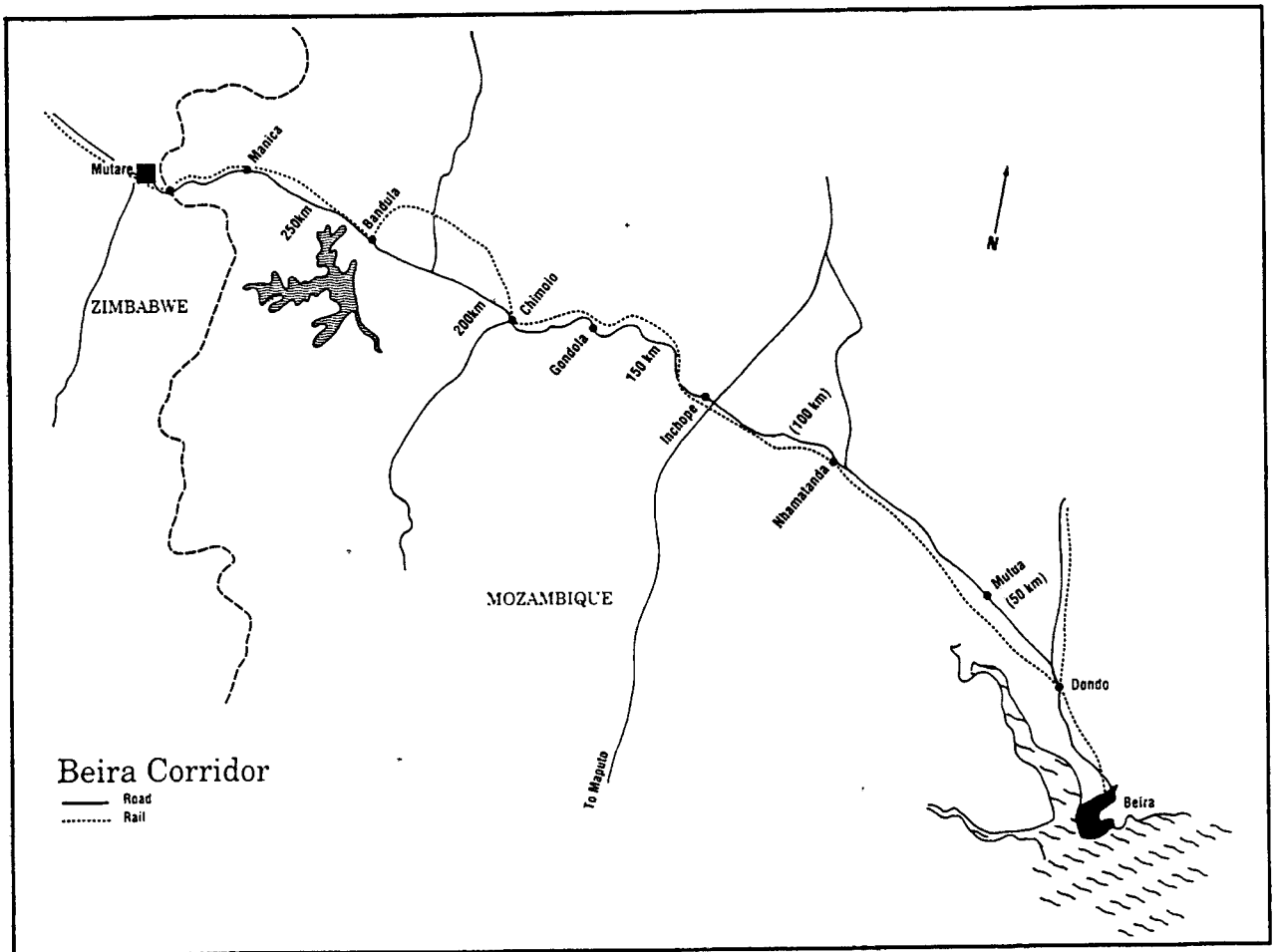
The first section of the railway line from Beira is common to both the Machipanda and Blantyre line. The two separate out at Dondo, 28 km from Beira. The Machipanda line then continues across the flat coastal plain and the Pungwe River Basin, rising sharply in the last 89 km section to Machipanda.

The line is constructed from a mixture of BRS 60lb/yd rails on steel sleepers UIC 40 kg/m and ASCE 80lb/yd rail on timber sleepers. The timber sleepers are very old and many have disintegrated to such an extent that the rail spikes no longer hold the rails at gauge level. The long-term goal is to introduce the standard track adopted by the SATCC for international routes, based on 45 kg/m long welded rails on concrete sleepers.

However, in the immediate context, it was necessary to carry out emergency repair work at the same time as the port upgrading project. As part of a $5.5m pledge, USAID provided 83,500 steel sleepers to be used to replace old ones in the worst section of the line. Other elements of the emergency project included: resleepering (using timber) of the bad section of the line not covered by the USAID resleepering programme, supply of ballast, replacing loop lines wherever necessary, supply of tools for minor repairs and provision of technical assistance.

Initially, CFM requested NRZ to undertake rehabilitation of the line to Gondola; but subsequently the NRZ, protected by Zimbabwean forces, went all the way down to Beira, completing work in September 1987, even though donor funds were not immediately forthcoming.

It was only after completion of the work, which amounted to Z$6.4m (substantially less than that estimated in SADCC documents) that the Austrian government picked up the tab. An Austrian engineer who inspected the line said that the NRZ had "taken exactly the right measures to make the line operational. They have been carried out in a professional way and their results are deemed to be absolutely satisfactory. NRZ has built up all logistics necessary to carry out this work without touching the scarce resources of Mozambique."



As a result of the NRZ's efforts, line traffic was increased from one or two trains daily to five travelling each way with a capacity of 5,000 tonnes each. While at one point - following the emergency dredging operation - port capacity exceeded that of the railway line, this is no longer the case.

The locomotive situation along the route, once a principal cause for non-use of Beira by Harare businessmen, has also improved with the delivery of the first out of two diesel and nine steam locomotives, refurbished by **Zeco** in Zimbabwe, paid for by USAID. Zeco is also training Mozambican personnel for locomotive maintenance.

The Austrian government set aside $1m for maintenance facilities along the corridor (see track maintenance, CFM under SATCC plan), but this falls short of the esimated $3.5m required.

Norway has pledged $2.1m towards further rehabilitation work. This is considered desirable, but not urgent, as trains cannot travel at night, and therefore there is currently no great incentive to increase capacity beyond its present level.

The long-term plan for Beira includes building a double line between Dondo and Beira, at a cost of $7m, but this is contingent on an increase in traffic and is not likely to occur before 1994.

By mid-1988 funding had not been pledged for the emergency repairs to telecommunications between Beira and Machipanda, but CFM (C) had established radio communication to Gondola and Machipanda. It is hoped that this will help improve the tracking of wagons.

Road

The road linking Machipanda with Beira serves both Zimbabwe and Zambia, and has deteriorated to varying degrees owing to lack of maintenance in the past. Although the Mozambican authorities discriminate in favour of the railway line, businessmen see a clear need for the road to be in better service and the BCG has commissioned a special road study. The SATCC has drawn up a $22.2m project for the rehabilitation of the road, of which $9.2m has been raised from sources in Mozambique, the Netherlands and Sweden. Some $13m is being negotiated with the African Development Bank. Projects include: resealing of 161 km of road, resheeting of 97 km, reconstruction of 24 km, and the establishment of a maintenance capacity.

Funds already raised are being used for emergency work between Beira and Inchope by Mozambique's parastatal heavy engineering company, CETA EE, with technical assistance from Sweden and the Netherlands. The BCG is hopeful that the remaining stretch from Inchope to Machipanda will be contracted to a Zimbabwe firm.

The Oil Pipeline

This facility, owned by **Lonrho**, runs parallel to the road and railway line and currently serves only Zimbabwe. However, with a capacity of 1.2m tonnes per annum, the pipeline is currently being used to only half its potential capacity.

In October 1988 Lonrhro and the parastatal National

Oil company of Zimbabwe announced a joint venture project to extend the pipeline to Harare. They formed a new company, **Petro Zim Line Ltd** on a 50/50 basis and the $80m extension was expected to take about a year to complete.

It is hoped, especially with the completion of the extension, that more SADCC countries will make use of the facility. Malawi, whose oil is currently trucked in over a long and treacherous route through Zimbabwe (and/or Zambia) and Mozambique, is especially interested in this development. The BCG is urging that tariff and user agreements relating to the pipeline be renegotiated to encourage Malawi, Zaire and Botswana to use the Beira system.

Zimbabwe's Minister of Energy, Kumbirai Kangai, has recently authorised direct negotiations between the agencies operating the pipeline and various tank farms and petroleum companies in neighbouring states.

Security

In addition to their close patrol of the corridor, 7,000 to 10,000 well trained and equipped Zimbabwean forces have also been engaged in offensives against Renamo in northern Mozambique, thwarting a plan by the rebels to cut the country in two along the strategic corridor.

Renamo attacks along the corridor have been reduced to cowardly acts of sabotage, which are easily repaired. "It does not require a lot of courage to sneak up to a railway line and put a bit of plastic explosive on the track, and blow it up with a detonator, which is basically what they are doing," says BCG managing director Eddie Cross. "Therefore they are no real threat."

According to security officials in Zimbabwe, Renamo mounted 62 attacks on the railway system in 1987, blowing up three bridges. However, damage on the railway line was easily located and repaired within 40 minutes to an hour and cargo was not affected.

The Zimbabwe army carries out a security check of the line each morning, and bush is being cleared on either side to reduce vulnerability to ambushes.

Meanwhile, the pipeline suffered 22 blowouts during the year. It generally takes 1 to 2 hours to locate the problem and 4 to 5 hours to repair it. During 1987, it is estimated that five percent of operational time was lost on the pipeline as a result of sabotage attacks.

As a mark of the improvement in security, thousands of refugees are pouring into the narrow Beira Corridor, which will remain a major haven as long as Zimbabwean troops are stationed there. Unless South Africa decides to attack the corridor directly, it is likely to remain relatively secure.

An important aspect of BCG's strategy to improve the security situation is the encouragement of a number of agriculture projects. The group believes that increased economic activity will ultimately contribute to greater security in Mozambique. Projects which have been identified are: the Vanduzi scheme for mixed agriculture near Chimoio, a ranching project in Gaza Province (towards Maputo), forestry, coffee and tea in Espungabera (south of the Corridor, close to the Zimbabwe border) and the revival of a coconut plantation in Quelimane (on the coast, north of Beira). There have, however, been multiple delays in getting these projects going, partly as a result of bureaucratic hurdles.

Malawi-Beira

Malawi is linked to Beira by a railway line which runs from the southern commercial hub of Blantyre to Dondo, with a branch going through the coal fields of Tete province.

Traditionally, one-third of Malawi's cargo of about 700,000 tpa passed along this route, which was also significant for Mozambican sugar and coal exports. However, because of Renamo attacks, the line has not functioned at all since 1983, except for a daily passenger train that runs from Blantyre to the border. Even before 1983, the Mozambique section is said to have been poorly maintained, and the line is thought to be in need of major reconstruction. SATCC has only been able to make spot checks of the route by air.

At the moment, the only real work along the route is the rehabilitation of the section from Blantyre to the border, sponsored by the UK and Malawi. The track along this 209-km section consists of a mixture of old and relatively new BS 60 lb/yard rails laid on timber or steel sleepers. Many of the timber sleepers have deteriorated to the extent that elastic fastenings are becoming loose and gauge spread is occurring. The rehabilitation exercise, which is expected to be complete in 1990, comprises the supply and laying of 115 km of 80 lb/yd or 40 kg/m rail and 165,000 concrete sleepers complete with pandoral fastenings and 180,000 cu metres of ballast.

Meanwhile, SATCC has mapped out a $62m rehabilitation plan for the 33-km Dondo-Vila Nova da Frontiera section of the line, which is located in Mozambique. The rehabilitation of the first 30 km of the line from Dondo was actually carried out, with RR 91 lb/yd rails welded in lengths of 54 metres and secured by pandoral clips to baseplates on new timber sleepers. Repairs on the rest of the line - which consists of BS 60 lb/yd and UIC 40 kg/m rail on timber sleepers - is totally contingent on security. The work, which would be in two phases - emergency and long term - would include re-establishing saw mills to produce timber sleepers, spot resleepering with UIC 40 km/m rail, establishing a new ballast quarry, replacing - eventually - all BS 60 lb/yd rails with new UIC 40 kg/m or RR 91 lb/yd rails. The project would also allow for the provision of a new UHF and VHF radio system throughout, and a reliable signalling system.

The SATCC has also optimistically written in a $2m project for the provision of 54 new wagons written off by Malawi railways in Mozambique, in anticipation of renewed traffic, and a $0.6m project to extend the carriage and wagon workshops and servicing depot at Limbe.

Under current security conditions, however, and without any additional protection along the route, it is difficult to see any of these projects taking off.

In the meanwhile, some Malawi sugar is passing through the Tete Corridor, the road route through Mozambique used as a passage by Malawi to South Africa, and from there along the Machipanda-Beira railway line

to Beira. The quantity of Malawi sugar using this route rose to 78,000 tonnes in 1986-87, from an all- time low of 41,000 tonnes in 1984-85, but still well below the 115,000 tonnes in 1981-82. There is talk of Mozambican coal and sugar also making use of the Tete-Beira corridors.

Security along the route has so far been guaranteed by the Zimbabwe army, which in late 1987 halved the number of convoys along the route, complaining of a lack of spare parts for army vehicles. The number of convoys has since been restored to six a week, and Malawi has paid Zimbabwe $1m for its efforts. Zimbabwe is to continue to receive $500,000 per quarter from Malawi.

However, the section of the road from Nyamapanda to Zobue is reported to be in a poor state of repair, with several portions that can only be negotiated in first gear. Although this does not fall under the Beira port projects, SATCC has raised $18.6m (from Mozambique and the Kuwait Fund for Arab Economic Development) for the reinforcement and rehabilitation of the 273-km stretch of road. Mozambican construction workers are reported to be tackling the worst sections of the road.

Zambia-Beira

There are two possible connections between Zambia and Beira:

1. Direct: The road from Katete to Cassacatiza to Tete, from which Zambia is connected to the port either a) by rail, through the coal mine town of Moatize or b) by road, through Changara and Chimoio. SATCC has two projects - totalling $8m - for the rehabilitation of the roads, but these have not so far attracted any funding, underlying security concerns.

2. Through Zimbabwe: It is possible to go by road from Lusaka, via Chirundu-Harare-Mutare-Beira (the last portion, by road or rail).

The section from Lusaka to Chirundu is now being rehabilitated under a SATCC project.

SATCC also plans to carry out a $0.8m feasibility study on a link that would join the Zambian railway main line at Kafue to the Zimbabwe railway system at Lions Den, providing Zambia with a rail route all the way through to Beira. This possibility has been considered since 1913. However, the construction of the 350-km link would be a major engineering task, as one-third of the route passes through countryside that would necessitate heavy earthworks to achieve a reasonable ruling gradient. The main advantage is that the work could be undertaken - at least under present circumstances - with relatively minor security risks. Funding for the study is still being sought.

The Harbour

Beira (lat 19° 50' S, long 34° 51' E) is a tidal port at the confluence of the Pungwe and Buzi Rivers. Ships calling at the port, as the SADCC ten-year development plan points out, "have to negotiate a dredged channel of considerable length through an extensive area of gullies and shoals before being able to berth at the quays."

Entrance to the port is through the Macuti channel which is 200 metres wide and has a minimum depth of six metres below chart datum. This means that only ships with a maximum mass of 25,000 dwt can use the port - restricting the choice of ships which can use the port and increasing shipping rates because of the smaller load.

Dredging

Initially, an emergency dredging operation, funded by the Dutch, was launched to restore depth to the -6 metre level. For a time, maintenance dredging was carried out by *The Sofala*, supported by two tow barges, while the bucket dredger *Rovuma*, owned by the Mozambique state company Emodraga, was taken off to Maputo (see Chapter 2).

Due to floods at the end of 1987, the channel began to silt up again, although this did not affect the size of ships entering the port.

However, *The Rovuma* returned to Beira in the second half of 1988, and the Dutch firm, Boskalis, has been awarded a contract to proceed with a $13m capital dredging operation, funded by the Dutch government. This aims - over the next two years - to widen the channel from 100 to 160 metres and to increase the draft at low tide to nine metres, permitting 60,000 dwt ships to use the port.

Bouyage

Navigation buoys equipped with gas lights were replaced by buoys with batteries and solar panels, but the port then sufferd from a shortage of batteries. In 1985 only six out of 16 bouy lights were reported to be working and ships could only use the port in daylight. However, under the Swedish funded programme to improve the navigational aids in Mozambican ports (see Maputo, Chapter 2), the long-awaited batteries finally arrived in February 1988, making night-time navigation possible again.

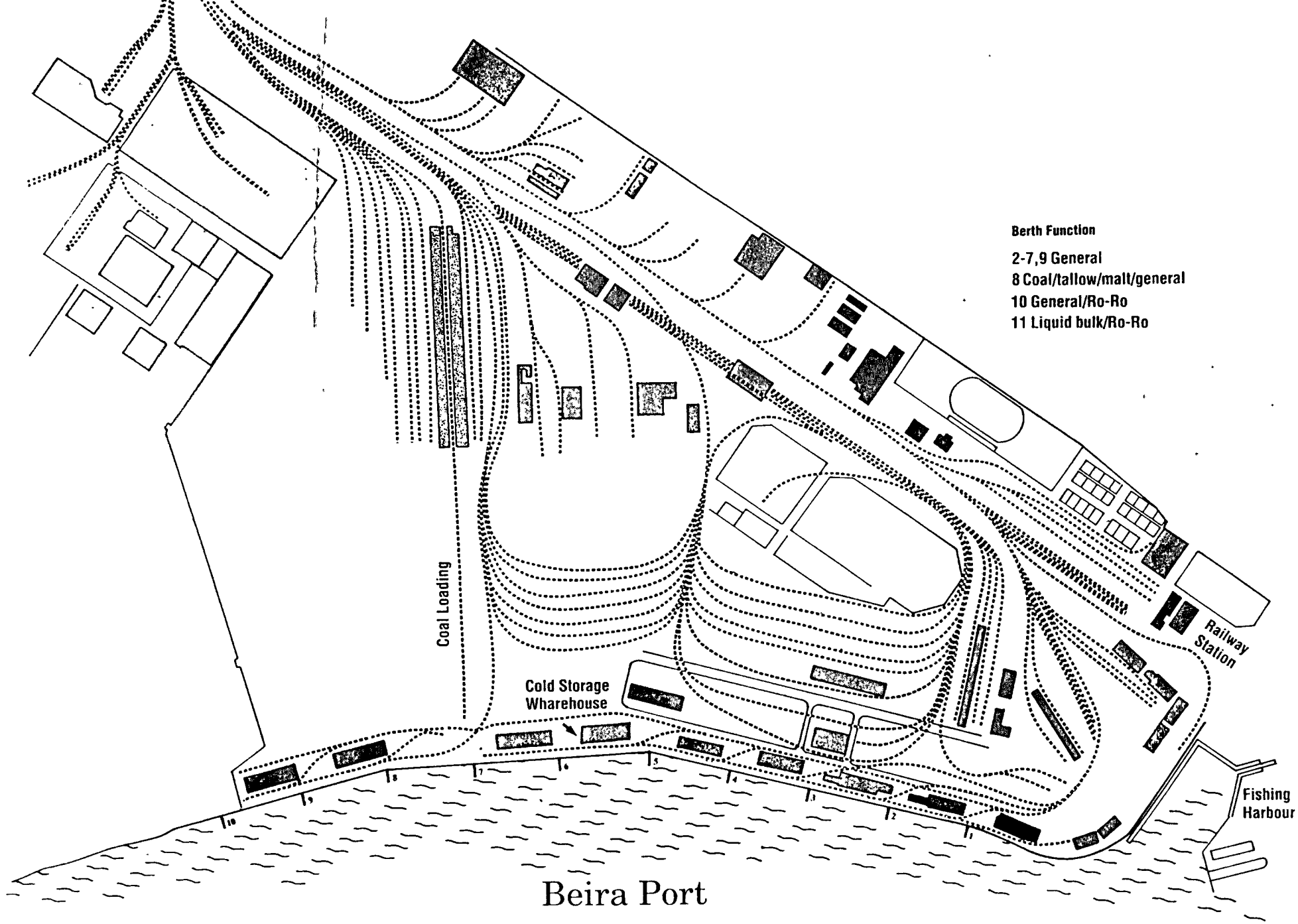
Pilotage

Pilotage is compulsory, with contact between ships and pilot's office by VHF radio. Two new pilot boats, funded by the Danish aid agency, Danida, were delivered to Beira in May 1988.

The Port

General

Accommodation of ships is provided by a continuous quay with 10 berths over a length of 1,632 metres. The southern end of the quay contains an additional berth of 160 metres (designated as Berth 1) and is used as a fish-


Berth Function
2-7,9 General
8 Coal/tallow/malt/general
10 General/Ro-Ro
11 Liquid bulk/Ro-Ro
Coal Loading
Cold Storage
Wharehouse
Railway
Station
Fishing
Harbour
Beira Port
Entrance to berths
from south

ing harbour. The main characteristics of the berths are illustrated in the map.

The six berths for conventional ships and cargoes have wide aprons, each carrying three sets of rail tracks and about 80% of all breakbulk and bulk cargoes handled at the berths are directly transferred from/into railway wagons placed on the tracks. Transit sheds are therefore modest in size, but are backed by a large warehousing complex within 3 km of the port, owned by freight agents. Altogether, there are 19 warehouses in the port area, with a capacity of 45,000 cu metres, and 25 transit warehouses with a capacity of 61,325 cu metres outside the port area.

The equipment position at the port in October 1988 was as follows:

- 31 shore cranes were operational and of the five out of order, four were under rehabilitation. Of those which are working, nine have been overhauled under a West German-funded programme covering all three of Mozambique's main ports. In general, upgrading and replacement of port equipment has not kept pace with improvements in the port and there have been substantial delays in shore crane repairs. However, the contractor (**HPC** of West Germany) has undertaken to complete work on schedule by the end of 1988.
- 21 out of 37 5t forklifts were operational.
- Two out of three 2.5t forklifts were operational.
- 12 out of 21 3.5t forklifts were operational.
- Four out of five 20t forklifts were operational.

Two 42t and two 28t forklifts with spreaders were expected in August (see above). In addition, three refurbished 20t forklifts ex-Maputo were due to be installed.

There were four tugs providing assistance to seagoing ships, but only one was in service. Two new tug boats, funded by Denmark, are due for delivery over the next year.

Leaving aside the berths which currently perform, or will perform specialised functions (see below), Berths 6 and 7, 9 and 10 were being repaved, and the area behind the latter two is being developed as a temporary container park.

A Mozambican company, **Construcoes Tecnicas SARL**, was awarded the contract to resurface these areas but encountered numerous difficulties with supplies. Eventually, arrangements were made to import crushed stone from Zimbabwe, but further delays were encountered in securing confirmation of letters of credit against the Banco de Mozambique, as well as customs clearance on the Zimbabwean side.

Resurfacing of Berths 6 and 7 is now complete (one year behind schedule) but some of it has to be redone, due to poor workmanship. At the time of writing, work was still in progress on Berths 9 and 10. Estimates vary as to when this will be complete, although it should be by year end at the latest.

The temporary container hardstanding area was only 25% complete. This caused problems during the heavy rains experienced at the end of the year, as containers had to be stacked helter skelter around the port, often in muddy patches. Work is expected to be completed at the same time as that on Berths 9 and 10.

Multi-purpose and container handling terminal (Berths 2 to 5)

The purpose of this project is to improve the handling of general cargo and containers, which are expected to increase from 5,000 in 1985 to 80,000 in 1995. Berths 2 to 5 are currently used for handling general cargo and cabotage. According to the ten-year plan, "the quay foundations have deteriorated to such an extent that the whole structure may collapse at any time." The project consists of the following components:

1. The reconstruction of the quays, costing $57.8m, is being funded largely by the EEC. This work, due to have commenced early last year, is only now just beginning, with the awarding of a contract to the Italian consortium, **Impreglio Sadelmi**, in October. (Since then, it has been revealed that most of the supplies for the contract are to be sourced from overseas. The BCG, which had hoped that major sub-contracts would be obtained by businesses in the region, termed this a "disappointing outcome", and blamed it on inadequate information on the part of the contractor.)

The work, which includes paving of areas behind the quays, is expected to take three years to complete, and will be done berth by berth, to disrupt traffic as little as possible.

2. The reconstruction of the berths will have to be accompanied by a relaying of the roads and railways within the port. A $10.5m new layout of the port's railway system is outlined in the Beira port master plan. It includes construction of new yards and tracks for container loading and unloading. Unloading and loading of general cargo from railway wagons will be done through transit sheds and only very heavy goods will be handled directly on the apron. The project is to be funded by Italy, with the $1.5m in local currency put up by Mozambique. Meanwhile, some road reconstruction works are currently being carried out by Mozambique, but the road system will require modification, as the new terminal will interrupt the main road running at the rear of the cargo zone. It will also be necessary to reconstruct roads in the central port area, in tandem with the rearrangemernt of the port railways. Work is likely to be carried out by a Mozambican construction company.

3. Equipment for the multi-purpose and container handling terminal, including gantry cranes, at a cost of $41.7m, is under discussion. At the SADCC annual consultative conference in Arusha in January 1988, Finland and Sweden pledged $11.4m towards this, and the ADB has expressed interest in financing ship-to-shore cranes. (At the moment, because of the equipment problem in the port, Ro-Ro vessels have to rely largely on their own equipment.)

The multi-purpose and container terminal project will benefit from the concurrent dredging exercise, making it possible to berth cellular container vessels, and for the port to handle 100,000 containers, as against the 36,000 containers a year which Fonseca says is the maximum the port can handle under current conditions.

Specialised facilities

Coal terminal

This is found at Berth 8, and has been completely rehabilitated to handle bulk consignments of coal. The facility has a loading rate of 700 tonnes per hour, an annual capacity of 1.5m tonnes, and a storage capacity of 150,000 tonnes. The third phase of the ten-year plan includes a $160m project for the development of a high capacity coal terminal, capable of handling outputs of up to 5.5m tonnes from the rich Moatize coal seams by the end of the 1990s. This, however, is contingent on security, and the reopening of the main north-south rail link between Beira and Malawi. So far only Mozambique has pledged funds for the project ($16m in local currency). Meanwhile, with only 0.2 to 0.3 million tonnes of coal passing through the port every year, much of the facility's capacity is idle, and there is talk of temporarily converting it into a grain handling facility. In the meanwhile, as construction is taking place along Berths 2-5, Berth 8 will be used for more general cargo.

Liquid bulk cargo

Berth 8 also accommodates the shipping pipelines for molasses (8,000 tonnes storage capacity) and tallow tanks (2,360 tonnes storage capacity).

Cold Storage

The port currently has a pre-cooling plant with a storage capacity of 60,000 cartons and 490 tonnes of meat. However, this does not cater for chilled meat - the form required by the EEC. Zimbabwe anticipates that an additional cold storage capacity of 6,000 tonnes for chilled and frozen meat products will be necessary in the future. The cost is estimated at $8m. It is hoped that users of the facility will finance the project, but that depends on increased usage of the port.

Oil Terminal

Oil is currently handled on Berth 10, and Berth 11 is constructed as a jetty for handling Ro-Ro vessels. Loading arms for oil handling have recently been installed on the jetty. However, the basin along the two berths is -10 m deep and only allows for 25,000 tonne dwt tankers. The depth cannot be increased due to destabilisation of existing structures. It is proposed that a new oil terminal will be constructed 1,000 metres upstream of Berth 11, where depth will be increased to -13.5 metres in co-ordination with the entrance channel dredging project, to enable the port to handle oil tankers of 60,000 dwt. The project is being financed by Norway ($8.1m) and Mozambique ($0.9m). Tenders were to be launched in November 1988 (more or less on schedule), with work due to be completed by March 1991.

Planned facilities

Sugar and cereals terminal/bulk grain silos

There are currently no sheds for handling sugar and cereals. The plan proposes the construction of two sheds and a conveyor for the handling of sugar and cereals behind Berth 11. Ideally, this would come into operation as soon as the new oil terminal is ready. Bulk grain silos may also be built alongside these facilities. Mozambique hopes to involve parastatals in the region, like the Grain Marketing Board in Harare, on a joint venture basis in implementing these two projects, costed at roughly $9m.

A World Bank study on the port disagrees with both facilities, arguing that Maputo is the natural outlet for sugar, and concluding that the region will not be importing or exporting much grain after 1990. However, businessmen argue that while Maputo may service Zimbabwe's sugar export needs, it does not cater for Malawi and Mozambique,which the plan says will be exporting 200,000 tonnes of sugar by 1995. The question of grain movements through the port is also contentious. The BCG says that given the time period required for the recovery of food production in Mozambique, and the slow rate of growth in wheat and rice production in the inland SADCC states served by the port, future demands of food imports through Beira port will run at approximately 350,000 tonnes per annum.

Tobacco and cotton terminals

These would service the needs of Zimbabwean exporters. The Zimbabwean Tobacco trading company says it needs a terminal capable of handling 1,000 containers a month combined with a handling warehouse, fumigation, storage of break bulk and administrative premises. A suitable plot would have to be found in the port. Meanwhile, cotton exporters have said they need a cotton terminal with storage and container handling facilities for 7,000 containers per annum. Both projects are costed at $3m, and were expected to be financed by Zimbabwean users, but have not yet been justified by demand.

Training and management

Beira will benefit from the Port Staff Training Institute in Maputo (see Chapter 2). In addition, the Nordic countries have put up $8.7m out of $20.5m being requested for projects to help satisfy the essential needs of port and railway workers in order to improve labour productivity. This covers a fishing and farming co-operative, worker transport, and housing projects.

On the management side, the EEC has funded a $1.3m study on the structure, management and performance of CFM-C. Spain and Belgium have put up $4.2m in technical assistance to the CFM and $11.8m is being sought from the World Bank.

Under the Dutch aid programme, $5.1m has been earmarked for technical assistance to the port, and $0.5m is being considered in supplementary financing for offices and other equipment. A team of ten Port of

Amsterdam officials is now in place. These include a harbour master, terminal manager, mechanical/electrical engineer and manpower development expert. The arrival of the team was delayed by a housing shortage in Beira, and plans were somewhat upset when two of the Dutch experts resigned - partly out of frustration.

Ancilliary projects

The ten-year development plan includes a study of the development of the town of Beira (already carried out with Finnish aid) and a series of Beira town projects, costed at $55m, in which the Scandinavian countries have so far showed the most interest. The rationale behind this is that the development of trade via Beira ultimately depends on normal town services. The town - the closest beach resort for Zimbabwe - could also earn Mozambique an appreciable amount of money through tourism.

Listed projects include rehabilitation and upgrading of infrastructure, construction and rehabilitation of public buildings and upgrading of commercial services. This was also an area in which a considerable role was envisaged for the private sector.

The main donor funded project so far has been the awarding of a $8m contract for the builing of 64 housing units (mainly semi-detached apartments), recreation, common room and sporting facilities for expatriates to the Finnish company, **YIT Ltd.** Work was scheduled to be completed by the end of 1988.

Meanwhile, Beira is to benefit from a $40m World Bank project for the rehabilitation of roads and drainage, rehabilitation and extension of water distribution networks and sewer systems, construction of coastal erosion defences and completion of unfinished apartment blocks and office buildings in Maputo and Beira. The Bank (tlx 440098, or phone 202 473 5063, Washington) believes that this is an area where Zimbabwean construction companies could participate. There has been considerable ill-feeling created in Zimbabwe over other aid contracts (see for example the multi-purpose and container terminal) in which local companies say they have not been given a fair chance.

The BCG itself has set up an office in the AMI building in Beira, adjacent to Austral, with the aim of representing the BCG in its dealings with Austral and in relation to joint-venture activity in general. The office is also intended to act as a sales representative for companies wishing to deal in Beira.

The Mozambican state tourist company, **Empresa Nacional de Turismo**, has advertised a wide range of services to businessmen, including transport to and from the airport, car hire, hotel flights and confirmations.

Businessmen have, however, experienced a number of disappointments. The long delays in getting agriculture projects going (see access routes) is one example. Another is the plan by the Zimbabwe Cresta hotel group to take over management of the Dom Carlos hotel in Beira. This was called off when the parastatal Zimbabwe Tourist Development Corporation elected to take on the task, together with Empresa Nacional de Turismo. Although the two have signed a memorandum of intent to invest Z$1.5m in refurbishing the hotel, there had been no progress on this front by mid-1988.

In his first annual report in 1987, BCG chairman Denis Norman said that little or no progress had been made on actual investment by individual business concerns "despite the considerable interest shown by the business sector."

Progress, he added, "would be much faster if time-consuming bureaucratic procedures could be eliminated." This, he said, "deserves the urgent attention of regional governments."

Services

Shipping Services

As in the case of Maputo (see Chapter 2) SAECS provides the main Ro-Ro service, sailing to the port every 21 days from Europe, Scandinavia and the Baltic. In January 1987, SAECS member **Overseas Containers (OCL)** introduced a new regular service linking Beira with the Far East and Australasia through other East African ports and Dubai. Other vessels call on a charter basis (see Table 3.2).

It was announced in mid-1988 that a Madagascar-based shipping line was introducing regular services between Beira and Dar es Salaam, for breakbulk container handling.

Communications

General communications between Beira and its sister ports in Mozambique and regional customers have improved through completion of a satellite link as part of the national telecommunications programme. Most forwarding companies have their own telex, radio and telefax facilities.

As of 1 June 1988, the Mozambican airline, **LAM**, resumed its Beira-Harare air service, and introduced a new service to Lilongwe.

The Harare flight leaves Beira at 0915 on Mondays, Tuesdays and Thursdays, takes half an hour, and turns back in another half hour to Beira. The Lilongwe flight leaves Beira at 0915 on Wednesdays and Fridays, and turns back from Lilongwe at 1130 on those two days. (LAM Harare phone no. is 703339, and LAM Maputo office is Tlx no 6332 or 6386).

In addition, the BCG and AMI run a weekly executive briefing on Tuesdays, using a chartered flight from Harare to Beira.

Electricity

Sweden has awarded a $9m contract for the supply of a stand-by power plant (17 MW gas turbine) for Beira port to **AAB Stal**. The contract, reports the BCG, includes ancilliary equipment, spare parts and a five year service contract. Delivery was scheduled for the end of 1988, and the installation will ensure that the port is always supplied with electricity.

Annex 3.1

Beira contacts and addresses

Names and addresses of relevant CFM officials are contained in the overall CFM organisation chart (Chapter 2).

- *The Beira Corridor Authority*, headed by Rui Fonseca, has established an office at: Cruzerio do Sul Building, First Floor, Rua Costa Serrao, 150. Telex: 7495 MO; Phone: 27188 or 27191. (The deputy director is Goncalo Antonio Ferrao, an economist. There is a three-person Nordic technical support team in the office, led by Palle Lonborg Madsen).
- *The Beira Corridor Group* is headquartered in Harare. Chairman: Denis Norman, former Zimbabwe Minister of Agriculture; managing director: Eddie Cross, former general manager of the Zimbabwe Cold Storage Commission. The BCG's new offices are at 207 North Avenue (corner North and 9th St) Harare. Phone: 739302/3, 721956/8, 739302/3; telex: 2705 BCG ZW.

The BCG is setting up an office in Beira, and in mid-1988 was sharing offices with *Austral* (address below). BCG contact in Beira is Mrs D Wolf; Austral contact is Carlos da Gama Afonso. The offices are in the AMI Building, Avenida do Poder Popular. Phone: 27485 or 27496; telex: 7431 CUAMA MO.

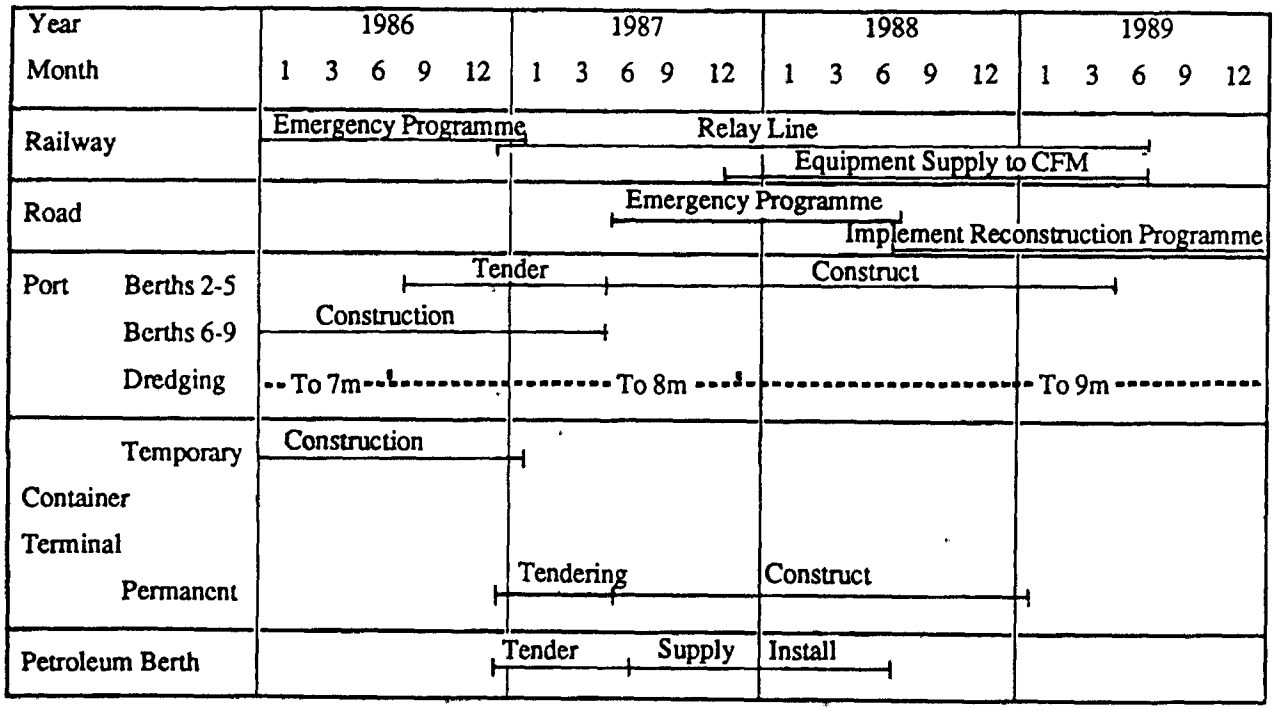
The Malawian director on the board of BCG is George A Jaffu, director, *Lonrho Malawi*, P O Box 5498, Limbe, Malawi. Phone: 640000; telex 4117.

BCG's Botswana director is Richard Mannathoko, general manager and chief executive of *BP Botswana* and chairman of the Botswana Employers' Federation.

- The chairman of the BCG's sister company, Sociedade Austral de Desenvolvimento, is Antonio Almeida Matos. The office in Maputo is headed by Celia Meneses. Address: Avenida 25 de Setembro, 2400, P O Box 605, Maputo. Phone: 28041/6; telex 6220 UDRA MO.
- The head of Mozambique's state tourist corporation, **Empresa Nacional de Turismo**, in Beira is Lovemore Mousinho Ernesto. Phone: 24152.

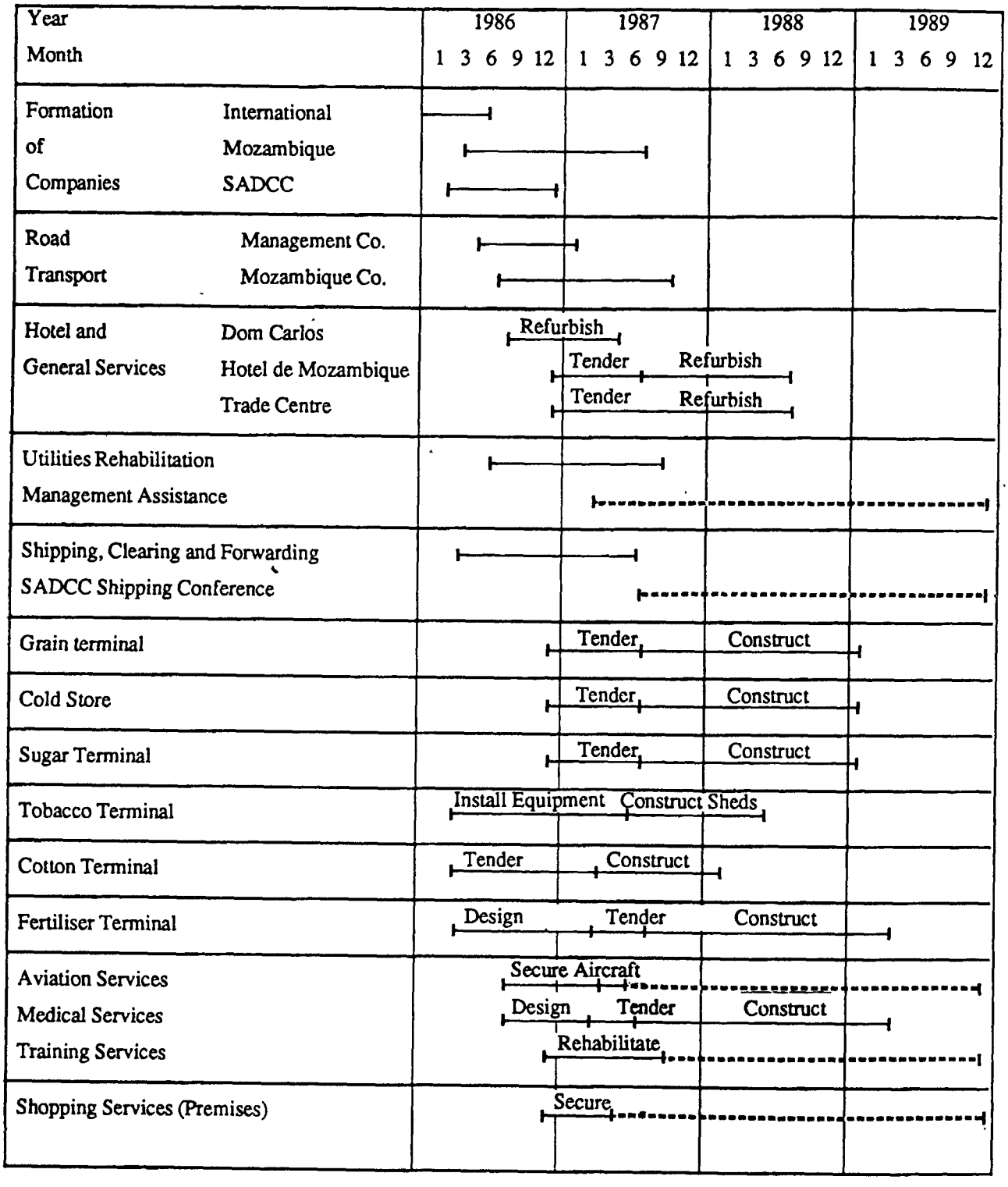
Annex 3.2

Beira Corridor Development Programme - Transport



Annex 3.3

Beira Corridor Development Programme - Business Sector



Directory

Clearing Agents & Freight Forwarders

AMI
PO Box 72 & 82
Avenida du Poder Popular 47
Beira
Telex 7331/7422 or via Zimbabwe
Phone: 24001/2/3

Expeditors Zimbabwe
Import - Export - Surface - Air
Clearing & Forwarding
Head Office:
24 Martins Drive, Msasa, Zimbabwe
Telex: 2146 ZW
Phone: 46815

Annex 3.4

Beira Port transport system projects - SATCC January 1988 *(all amounts in $ millions)*

Project no.	Project title	Estimated cost Total	Foreign	Local	Secured funding Amount/Source	Funding Under negotiation Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
MULTIMODAL PROJECTS										
0.5.1	*Multimodal projects in the Beira Port transport system development plan	83.3	81.5	1.8	33.4	24.0	25.9			
(PR-M-01)	Organisation and Manpower	1.3	1.3	0.0	1.3 (EEC)	0.0	0.0			Pre-study completed by NORAD. Main study by EEC - Lome III regional funds.
(PR-M-02)	Support to workers	20.5	20.5	0.0	6.5 (Denmark) 1.0 (Sweden) 0.2 (Finland)	0.0	12.8			World Food Programme has been approached. Finland and Greece have been approached for housing.
(PR-M-03)	Study of the Development of the town of Beira	0.9	0.9	0.0	0.9 (Finland)	0.0	0.0			Completed.
(PR-M-04)	Project Co-ordination	5.6	5.6	0.0	5.6 (Nordics)	0.0	0.0			Agreement signed. Project co-ordination team started work in July 1987.
(PR-M-05)	Beira town projects	55.0	53.2	1.8	10.6 (Sweden) 1.5 (Italy) 1.5 (Netherlands) 1.2 (Denmark) 1.3 (Finland) 1.8 Mozambique	1.3 (Sweden) 6.7 (Finland) 16.0 (IBRD)	13.1			
ROADS										
1.5.1	Road projects in the Beira Port transport system development plan	33.5	30.7	2.8	11.2	13.0	9.3	1988	3 years	
RD-CE-1)	Beira-Machipanda	22.2	21.4	0.8	0.8 (Mozambique) 5.0 (Netherlands) 3.4 (Sweden)	13.0 (ADB)	0.0			Emergency repairs estimated a US$9.2m started early 1988. Design for reconstruction to be made.
(RD-CE-2)	*Lusaka-Kafue Junction	30.1	19.0	11.1	5.5 (Norway) 11.1 Zambia	0.0	13.5			Included in project 1.8.3.
(RD-CE-3)	Chimoio-Changara	6.0	3.0	0.0	0.0	0.0	3.0			
(RD-CE-4)	Matundo-Chiuta	0.5	5.0	1.5	1.5 Mozambique	0.0	5.0			
1.9.1	Rehabilitation of Harare - Chirundu Road, Zimbabwe	1.8	1.3	0.5	0.5 Zimbabwe	0.0	1.3	1989	2 years	
RAILWAYS										
2.5.3	*Railway projects in Beira Port transport system development plan	151.1	138.8	12.3	71.0	16.6	63.5	1986	10 years	Project derived from Beira Port rehabilitation study of 1981.
(R-CE-01)	Rehabilitation Beira - Machipanda	8.8	5.9	2.9	3.8 (Austria) 2.1 (Norway) 2.9 ((Zimbabwe)	0.0	0.0	1987	1 year	Technical Assistance from Zimbabwe.
(R-CE-02)	Emergency repairs Dondo-Vila Nova	15.0	12.0	3.0	8.5 (OPEC) 3.0 Mozambique	0.0	3.5			

Project no.	Project title	Estimated cost Total	Foreign	Local	Secured Funding Amount/Source	Funding Under negotiation Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
RAILWAYS (ctd)										
(R-CE-03)	Track rehabilitation Blantyre Border	15.5	12.4	3.1	3.1 Malawi	12.4 (UK)	0.0			On-going.
(R-CE-04)	Rehabilitation Dondo-Vila Nova	47.0	47.0	0.0	8.5 (OPEC) 18.5 (Italy)	0.0	20.0	1987	5 years	Contract for 1st phase Dondo-Mwanza signed (100 km). Italy has been approached for $20.0m.
(R-CE-05)	Study, rail link Kafue-Lion's Den	0.8	0.8	0.0	0.0	0.0	0.8			
(R-CE-06)	Line doubling Beira to Donao	8.0	6.4	1.6	1.6 Mozambique	0.0	6.4			
(R-CE-07)	Track maintenance CFM (C)	3.5	3.5	0.0	1.0 (Austria)	0.0	2.5			UK has been approached.
(R-ME-01)	Scrapping, salvaging of wagons and locos, rehabilitation of wagons conversion to R.B'rings CFM(S)	3.3	3.3	0.0	3.3 (Denmark)	0.0	0.0	1988	3 years	Discussions on implementation between Denmark and Cometal/ Mometal.
(R-ME-02)	Rehabilitation of locomotives CFM(C)	4.7	4.7	0.0	4.7 (USA)	0.0	0.0	1986	5 years	Rehabilitation of 11 locos (acquisition of new locomotives under P. 2.5.12). ADB considering.
(R-ME-03)	Replacement of Malawi railway wagons	2.0	2.0	0.0	0.0	0.0	2.0			
(R-ME-04)	Rehabilitation of locomotive workshops CFM(C)	2.5	2.0	0.0	1.0 (USA)	0.0	1.5	1986	2 years	World Bank has been approached
(R-ME-05)	Extension of Limbe workshop	0.6	0.6	0.0	0.6 (UK)	0.0	0.0	1988		
(R-ME-06)	Facilities, spares, equipment for CFM(C) workshops	6.2	5.0	1.2	1.2 Mozambique	0.0	5.0			
(R-ME-07)	Rescue cranes and rerailing equipment	4.0	4.0	0.0	4.0 (Finland)	0.0	0.0			
(R-OP-01)	*Motive power, rolling stock operation plan	0.2	0.2	0.0	0.2 (Canada)	0.0	0.0			Financed under P. 0.0.5. Completed in 1987.
(R-OP-02)	Electrification study	0.7	0.7	0.0	0.0	0.0	0.7			
(R-ST-01)	Emergency repairs to telecommunications Beira to Machipanda and Vila Nova	2.1	2.0	0.1	0.1 Mozambique	0.0	2.0	1988	1 year	
(R-ST-02)	Radio telecommunication (CFM(C)	2.9	2.9	0.0	0.7 (Italy)	0.0	2.2			1st phase Beira-Machipanda line.
(R-ST-03)	Train control system (CFM(C)	3.7	3.5	0.2	0.2 Mozambique 1.8 (Italy)	0.0	1.7			1st phase Beira-Machipanda line.
(R-ST-94)	Replacement of Railway telephone exchanges CFM(C)	0.8	0.6	0.2	0.2 Mozambiaue	0.0	0.6			Denmark has been approached.
(R-ST-06)	Solar Power Panels, Blantyre to border	0.1	0.1	0.0	0.0	0.0	0.1			Denmark has been approached.
(R-TA-01)	Technical assistance to CFM	16.0	16.0	0.0	0.0 (USA)	3.0 (Spain) 1.2 (Belgium)	11.8			World Bank to be approached for US$11.8m.
(R-TA-02)	Technical assistance to Malawi Railways	2.0	2.0	0.0	0.0	0.0	2.0			

Project no.	Project title	Estimated cost Total	Foreign	Local	Secured funding Amount/Source	Funding Under negotiation Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
PORT PROJECTS										
3.5.2	*Port projects in the Beira Port transport development plan	346.7	323.6	23.1	142.2	36.5	168.0	1986	15 years	Estimates of costs and funding represent the total of the sub-projects listed below.
(P-A-01)	Channel dredging to 8 metres	13.0	13.0	0.0	13.0 (Netherlands)	0.0	0.0	1988	3 years	Dredging to 8 metres in the first phase. Tender documents prepared. Dredging to start second half of 1988.
(P-A-02)	*Navigational aids	1.0	1.0	0.0	1.0 (Sweden)	0.0	0.0			Included in first phase of Project 3.5.4.
(P-CE-01)	Multipurpose & container handling terminal (berths 2-5)	57.8	57.8	0.0	52.5 (EEC) 2.3 (Netherlands)	3.0 (Netherlands)	0.0	1987	3 years	Works being initiated. Supervision will be financedby the Netherlands.
(P-CE-02)	New oil terminal	9.0	8.1	0.9	0.9 Mozambique 8.1 (Norway)	0.0	0.0	1988	2 years	Contract to be signed.
(P-CE-03)	Port railways	10.5	9.0	1.5	9.0 (Italy) 1.5 Mozambique	0.0	0.0	1988	2 years	TOR prepared. Consultant selected.
(P-CE-04)	Cereal terminal	9.0	8.1	0.9	0.0	0.0	9.0			Study on cereal terminal financed by the Netherlands. Users of the facilities are expected to be involved in funding.
(P-CE-05)	Cold storage facilities	8.0	7.2	0.8	7.2 0.8 Mozambique	0.0	0.0			Feasibility study carried out.
(P-CE-06)	Tobacco terminal	3.0	2.7	0.3	0.0	0.0	3.0			Users of the facilities are expected to finance the project.
(P-CE-07)	Cotton terminal	3.0	2.7	0.3	0.0	0.0	3.0			Users of the facilities are expected to finance the project.
j(P-CE-08)	*Grain Silos (combined with P-CE-4)	0.0	0.0	0.0	0.0	0.0	0.0			Waiting for the findings of study P-CE-4.
(P-CE-09)	Coastal protection scheme	10.0	9.0	1.0	1.0 Mozambique	0.0	9.0			
(P-CE-10)	Service port facilities	3.6	3.2	0.4	0.4 Mozambique	3.2	0.0			
(P-CE-11)	Port roads	1.0	0.0	1.0	1.0 Mozambique	0.0	0.0	1988		Being undertaken by Mozambican contractors.
(P-CE-12)	High capacity coal terminal	160.0	144.0	16.0	16.0 Mozambiquye	0.0	144.0			
(P-CE-13)	Port construction supervision	2.0	2.0	0.0	2.0 (Netherlands)	0.0	0.0			
(P-ME-01)	Equipment for multipurpose and container handling terminal	41.7	41.7	0.0	11.4 (Finland, Sweden)	22.7 (ADB) 7.6 (Sweden, Finland, Netherlands)	0.0	1987	5 years	First phase 1987-88 secured. Agreement on grant part signed June '87. Implementation started. ADB has expressed interest in financing ship-to-store cranes.
(P-ME-02)	Tug boats	10.0	10.0	0.0	10.0 (Denmark)	0.0	0.0	1987	2 years	Tenders Aug/Sept 1987. Yard contract by end of 1987.
(P-TA-01)	Technical assistance to the Port	5.1	5.1	0.0	55.1 (Netherlands	0.0	0.0			Funding secured for 3 years. Supp. finance (US$0.5m) for offices and other equip. being considered by Netherlands.
	TOTAL	**614.6**	**574.6**	**40.0**	**257.8**	**90.1**	**266.7**			

* The costs associated with this entry are not directly included in the Totals. They appear either under another project or as costs for sub-projects.
() Brackets around a country or financing agency indicates a foreign exchange contribution.

Chapter Four

Nacala Port and Transport Links

Mention Nacala to anyone familiar with ports in the SADCC region and their eyes gleam. Says one forwarding agent: "She's a real beauty of a port."

With the possible exception of Mombasa, Nacala is the best natural deep-water port in Africa. Yet, first for geographical, and now for security reasons, the port has never fully realised its potential. Newly refurbished, "humming and waiting to go" - as the forwarding agent puts it - Nacala, like Maputo, is desperately waiting for traffic.

Located in Mozambique's northern Zambezia province, Nacala has lagged behind Maputo and Beira in development, despite its natural advantages, because it is further away from inland centres of population. The port serviced mainly Malawi (handling about two-thirds of the country's overseas trade, while the rest went through Beira) and the once rich northern farming provinces of Mozambique. As such, its only real access route is the main railway line west to Blantyre, via the Mozambican town of Cuamba.

However, when SADCC was first launched, the Nacala port transport system projects proved a favourite amongst donors, possibly because of the port's potential. As illustrated in Annex 4.1, virtually all of the $277.9m sought for projects along this corridor have been raised, making Nacala, in percentage terms, the most highly subscribed of the SADCC transport projects.

The results are visible at the port, where under Finnish aid, 80% of a refurbishing plan, including the provision of a new container terminal, was complete by mid-1988. Estimates of the port's capacity vary, but 2m tonnes would seem to be reasonable. Certainly, Nacala could handle the better part of Malawi's overseas trade of roughly 700,000 tonnes per annum.

As in the case of Beira, the anomalies which made Nacala more expensive than the longer route through South Africa have been corrected.

The problem is along the railway line, where at the time of writing, work by a French and Portuguese consortium had been completely suspended, until they could be guaranteed more adequate security from Renamo attacks. By 1985, Malawian traffic along the route had dropped to negligible quantities (see Table 4.1). The railway is now used mainly for small movements of domestic traffic on either side.

Ironically the only Southern African country which has at any time shown itself favourably disposed to the rebel movement, Malawi has suffered most from Renamo's wanton acts of sabotage. The country currently pays 60-100 million US dollars extra each year in transport costs to get its cargo to and from South Africa by road, through the treacherous Tete corridor, or over a much longer route through Zambia and Zimbabwe. Transport has become Malawi's biggest economic headache. Indeed, it is said in Blantyre that transport is what will make the difference between either development or destruction in the tiny central African country.

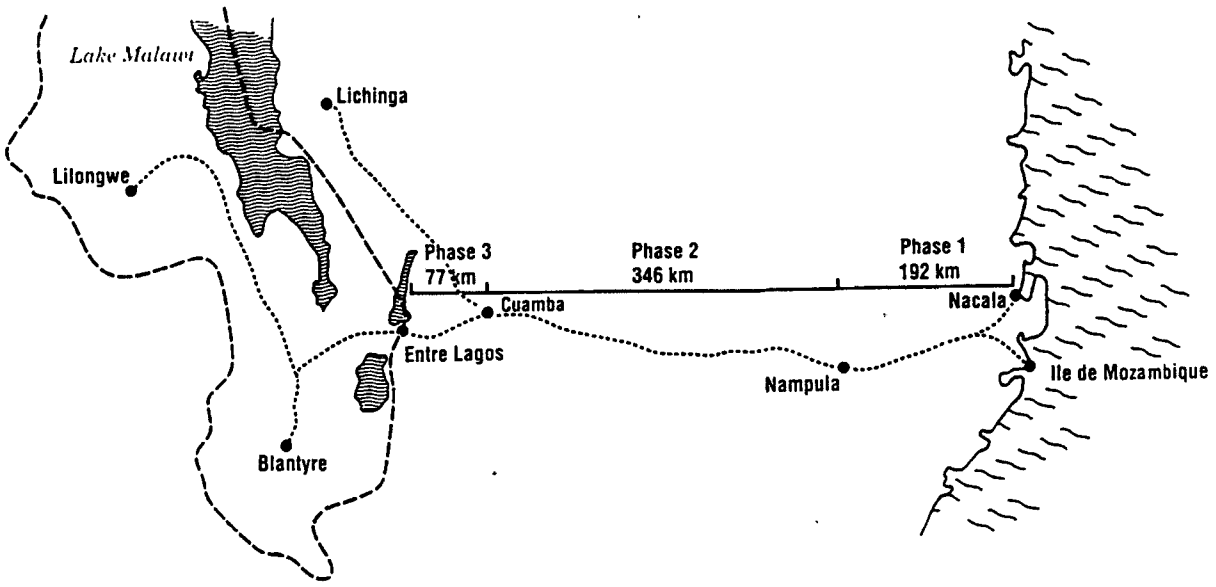
On 11 September 1986, when leaders of Mozambique, Zimbabwe and Zambia confronted Malawi's "life president", Kamuzu Banda, with evidence that Renamo was operating from Malawi, he denied the charge. However, faced with the prospect of Zimbabwe and Zambia impos-

Table 4.1

Nacala throughput *(tonnes)*

	1980	1981	1982	1983	1984	1985	1986	1987
TOTAL	752,200	785,600	802,600	629,000	495,500	196,400	223,400	284,700
Cabotage								
In	62,300	87,300	100,900	65,200	53,000	17,700	40,200	82,000
Out	71,500	87,200	145,700	101,000	58,500	7,400	46,200	67,800
Mozambique Cargo								
Exports	67,800	79,900	100,500	37,300	30,300	48,200	14,000	14,500
Imports	169,000	197,400	203,900	190,000	167,200	108,700	122,200	120,000
Exports transit (Malawi)	200,300	179,300	124,100	125,000	110,000	11,000	800	400
Imports transit (Malawi)	181,300	154,500	127,500	110,500	76,500	3,400	-	-

Nacala-Malawi railway: Rehabilitation



ing sanctions against Malawi's traffic, Banda reluctantly agreed to look into the matter. Shortly after, huge Renamo contingents, apparently being flushed out of Malawi, flooded Zambezia.

Since then, at least on paper, relations between Banda and Frelimo - tense from the pre-independence days - have improved markedly. In 1987, Malawi committed 800 troops to help guard the Nacala corridor, and these are reported to have put up a brave performance, despite taking some heavy casualties. The line is also protected by 600 Mozambican troops trained by the British security firm, **Defence Systems Ltd**, using a loan made to the government of Mozambique by **Lonrho**, which has agricultural interests in Zambezia.

Lately, combined Mozambique-Zimbabwe-Tanzania forces have again been on the offensive in northern Mozambique, scoring a major victory with the recapture of Milanje, along Malawi's eastern border with Mozambique, which had remained continuously in Renamo hands since 1985.

But the overall picture in the north was still blurred in the second half of 1988. While Frelimo seemed to have a better hold on the towns, Renamo was still able to roam about elsewhere. As one Western diplomat in Blantyre put it: "Frelimo seems to be gaining ground, but that could be transitory. It's difficult to get a sense of what is happening. You see a tree here and there without any real feel for the forest."

What this means for Nacala is difficult to say. The CFM's policy is to make the best of a bad situation and promote the use of the port as a transhipment centre for container and bulk cargoes.

However, as will be seen in the detailed description below, serious security negotiations are in progress. Because of the money that has already been put into the port, its importance for Malawi and its natural advantages, there is a general optimism about the corridor, even if it is sometimes difficult to say what this is based on. One forwarding agent viewed the port's future optimistically: "Nacala will work. It has no choice but to work."

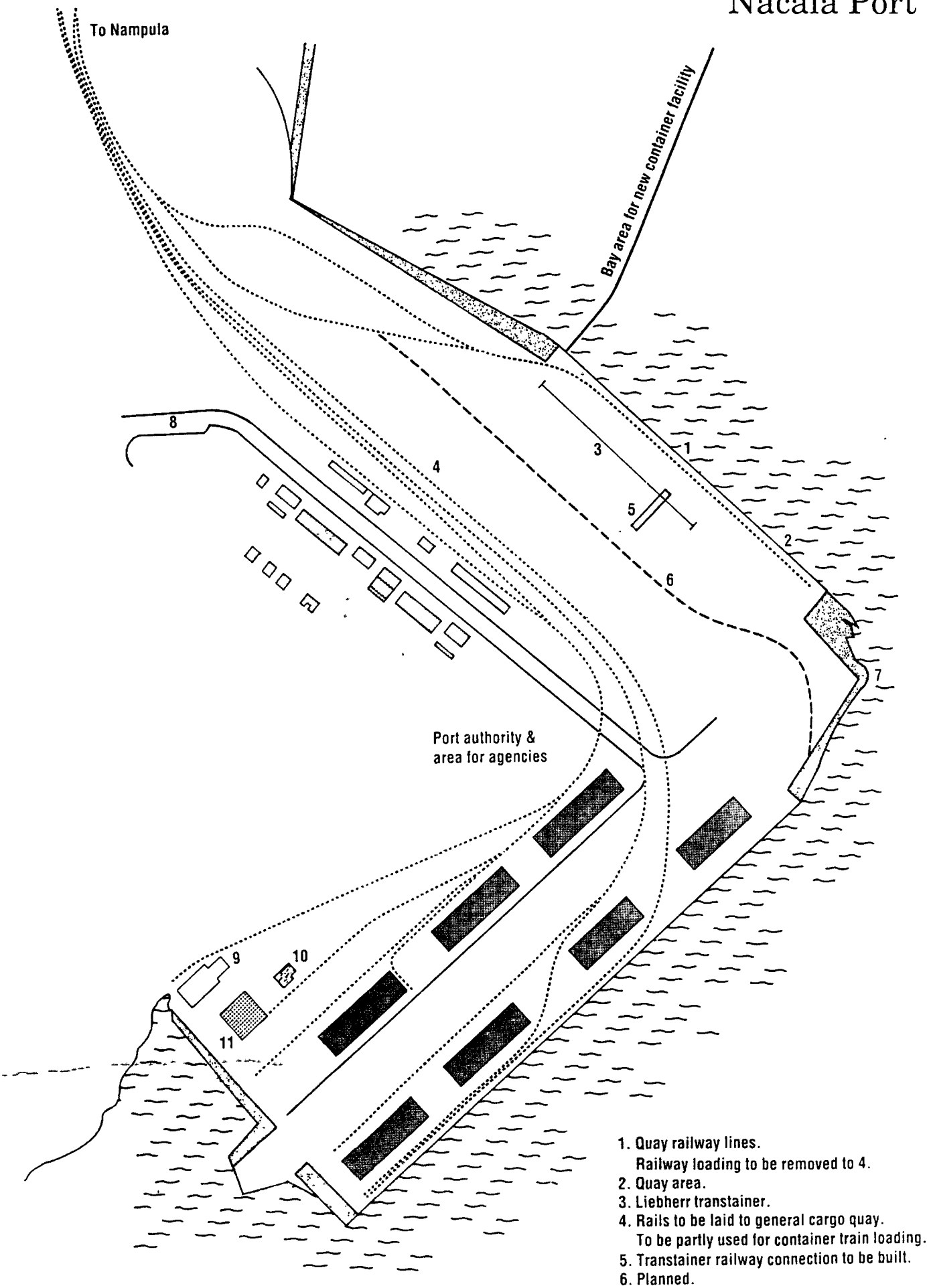
Access routes

Although SATCC project documents (see Annex 4.1) list two road projects under the Nacala transport system, these do not link up with the port and therefore are not dealt with here.

Access to the port of Nacala is provided by the one 615-km railway line from Entre Lagos on the Malawi border to the port (see map). The final part of the line from Cuamba westward was only completed in 1970, and is in fairly good shape.

Thus rehabilitation efforts have focused on the 538-km stretch from Cuamba to Nacala, which comprised 30kg/m rail on wooden sleepers, fishplated. Before work began, this section of the rail was in poor condition, with buckled rails, loose fastenings, bad joints and inadequate ballast. The $223.4m rehabilitation project - fully subscribed, mainly by France, Portugal and Canada - aimed to completely replace track between Cuamba and Nacala with 40 kg rail welded station to station and laid on B block concrete sleepers with 1,500 cu metres of ballast per km, as well as improve communications, and provide technical/management back-up.

Nacala Port



1. Quay railway lines.
   Railway loading to be removed to 4.
2. Quay area.
3. Liebherr transtainer.
4. Rails to be laid to general cargo quay.
   To be partly used for container train loading.
5. Transtainer railway connection to be built.
6. Planned.
7. Shore protection.
8. Road connection to town.
9. Maintenance building.
10. Spare parts shed.
11 Fuel tanks.

The contract was awarded to a consortium comprising **Borie Sae** (French), **Dehe** (French) and **Somafel** (Portuguese). Technical assistance is provided by the British consultants **Mott Hay and Anderson**, who have also been active along the Limpopo corridor. Their team comprises an assistant director general, operating manager, mechanical engineer and financial advisor. Work is under the direction of the Brigada do Melhoramentos do Norte, which falls under CFM-North (see organisation chart, Chapter 2), under the direction of Dr S.M. Bhatt.

Preparatory work commenced in January 1984, and consisted of setting up facilities for rail storage, production of 1,200 cu metres of ballast daily, production of 1,200 twin bloc concrete sleepers per day and commissioning of a train for flash butt rail welding. This was completed on schedule in 20 months. Renewal of the first section from Nacala to Nampula (192 km) started in September 1985, using Canadian supplied rails, and was completed in November 1986. This includes a railway communications system with radio links in each station, and the ability to communicate with locomotives on the track. The line is currently in use for domestic traffic.

Phase two (Nampula to Cuamba), funded by the same participants as phase one, plus the European Development Fund, Italy and Finland, commenced in April 1987, under considerable duress, because of security problems. In July 1987, the crew experienced its worst set-back when four Malawian troops and five railway workers were killed and extensive damage done to the track. The consortium finally suspended work in early 1988 75 km west of Nampula as they did not feel safe enough in the tropical forest area they were about to enter. Equipment and supplies are reported to have been abandoned in some cases, and are in danger of destruction by Renamo, which has also recently sabotaged a section east of Cuamba.

Security

Originally, the idea was that Malawian troops would provide an armed escort to trains as far east as Nampula. From there, it was hoped that the 600 DSL-trained Frelimo troops could provide adequate security on the refurbished section, which is more difficult to sabotage, and where trains can move at a much higher speed.

However, a French military team which visited the area in April 1988 estimated that the task demanded 3,000 soldiers, or one-tenth of Mozambique's army, which is clearly out of the question for Mozambique.

Various options are being looked at. One is to request Tanzanian forces stationed in the north to take over Frelimo's task on the relatively safe part of the route, so that Frelimo can reinforce the Malawi soldiers on the more volatile section between Nampula and Cuamba, where work still needs to be done.

Apart from the UK, which has provided two armoured locomotives for use on the corridor, the Western donor community has not been forthcoming with non-lethal military assistance for the corridor. It is hoped that because of the amount of money already invested in the Nacala transport system, this will change

The harbour

Nacala boasts an entrance half a mile wide with depths over 60 metres and does not require dredging. The harbour allows ships berthing without size limitation and the basin of the port is sufficiently large for the manoeuvering of large vessels. However, efficient tugboats and skilled tugboat masters will be required as traffic increases (currently the port has two tugs, one of which is also used as the pilot vessel). Access to the port is entirely free of navigational restrictions, although a recent report in the Mozambican newspaper, *Noticias*, says that the lighthouses and buoys are in need of maintenance repairs.

The Port

General

The port has a total of 1,000 metres quayside, 600 metres of which accommodates four conventional shipping berths, one of which is used to discharge POL into two tank farms, one run by **BP**, and the other by **Petromoc**. The storage capacity of these is estimated at 18,000 tonnes. The operating surfaces in the general cargo area are reported to be in better condition than those in Beira.

The port has eight warehouses, covering 19,300 sq metres. **Manica** has a major complex a few km from the port, serviced by road and rail, while **AMI** has two warehouses approximately 1 km away from the port.

Equipment at the port is currently deficient. There are 11 cranes, five with a 20-tonne capacity. Of these, the BCG found on a recent inspection tour only four five-tonne and one 20-tonne cranes working. **HPC** of Germany is currently working on the repair of cranes in Beira and Maputo and is due to start work at Nacala in January 1989. The refurbishing will take eight to nine months to complete.

Only nine forklifts are reported to be usable, while 16 are said to be irreparable, as many have been completely cannibalised. Simple and normal cargo handling equipment such as slings, ropes, pallets, pallet forks etc are also reported to be short. Once cargo starts increasing, a broad array of handling equipment will be needed.

Table 4.2

Number of ship calls at Nacala

	Container terminal	Conventional harbour	Total	Gross Register tons (/10,000)
1982	80	128	208	152.1192
1983	81	104	185	144.4675
1984	84	74	158	132.4280
1985	70	52	122	78.6067
1986	61	64	125	56.3375

The Container Terminal

The port has a dedicated container terminal, covering 400 metres of quay, which has been undergoing a major face-lift funded by Finland ($24m) and Mozambique ($4m).

Work on the project began in 1984 and the first phase - including lay out of terminal area (plus road and rail connections), specification and ordering of equipment, pavement of roads and storage area is complete. The terminal can currently handle 25,000 containers, After the second phase, when equipment is in place, more area is paved, training and management have been brought up to scratch, the port will be able to handle 60,000 containers per annum by 1990. The Finnish team is also providing technical and management support to CFM North.

Ancilliary projects

Unlike Beira, these are not included in project proposals. The BCG team which inspected the port notes, however, that there is a critical shortage of accommodation for business visitors.

Services

Shipping

Because of the low cargo at the port, shipping services are currently infrequent (see Table 4.2). Nacala's main challenge is to attract the **Beacon** line consortium, serving the East Africa-Europe route, back to the port. Until the railway is rehabilitated, CFM plans to market the port as a break-bulk centre for the region.

Communications

Communications with Blantyre are currently conducted through a radio telex system. The Finnish contractors have a satellite communications system for their own use. A telex system is badly needed, as well as a regular air service from the port to Nampula, to connect with other LAM flights.

Electricity

The town is linked to the Cahora Bassa HEP scheme, but currently relies on diesel generators for its electricity. The supply is reported to be adequate.

Annex 4.1

Nacala Port transport system projects

Project no.	Project title	Estimated cost Total	Foreign	Local	Secured funding Amount/Source	Funding under negotiation Amount/Source	Funding Gap	Implementation Start	Duration	Comments/Status
1.4.1	Study on upgrading of the road Mangochi-Mandimba-Mitande, Mozambique	0.2	0.2	0.0	0.0	0.0	0.2	1989	6 months	
1.8.6	Rehabilitation of the road Lusaka-Chipata, Zambia	26.3	16.6	9.7	9.7 Zambia	0.0	16.6	1988	3 years	Engineering study completed. ADB has shown interest.
2.5.5	Rehabilitation of the Nacala-Cuamba railway (538 km) Mozambique	223.4	193.4	30.0	87.7 (France) 40.0 (Portugal) 32.5 (Canada) 28.0 (EEC) 2.2 (Italy) 2.1 (UK) 0.9 (Finland) 30.0 Mozambique	0.0	0.0	1983	7 years	About 350 km of track have been renewed. Track laying of 2nd phase started in July 1987.
3.5.3	Design,const. & operational assist. of container terminal for the Port of Nacala	28.0	24.0	4.0	24.0 (Finland) 4.0 Mozambique	0.0	0.0	1984	5 years	Ongoing project, progressing on schedule. Management study to be completed by April 1988, financed by FINNIDA.
	TOTAL	**277.9**	**234.2**	**43.7**	**261.1**	**0.0**	**16.8**			

* The costs associated with this entry are not directly included in the Totals. They appear either under another project or as costs for sub-projects.
() Brackets around acountry or linancing agency indicate a foreign exchange contribution.
Source: SATCC 1988.