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Seaport planning in Zaire: an analysis of constraints and potentialities

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SEAPORT PLANNING IN ZAIRE :
An analysis of constraints
and potentialities

Written in partial
fulfilment for the
requirement of the Masters
of Science Degree in
Port & Shipping Administration ,
World Maritime University ,
Malmoe , Sweden .

J. KABWITA TSHILOMB

October 1990
ACKNOWLEDGEMENT

I would like to express my gratitude to organizations and individuals who provided me with information, assistance and advice and without whom it would have been more difficult to complete this thesis.

In particular, I am grateful to my supervisor Professor P.M. Alderton for his guidance and to Mrs Inger Battista for language correction.

I am also grateful to my former and present Ministers of Transport, Ambassador Kasasa, Ambassador Nzekele, the Secretary of State Mulamba, Mr Dakahudyno and Mr Tito for their wide ranging support during my two-year programme.

Last but not least, I would like to take this opportunity to thank my wife Evelyne and my daughter Gracia for their patience and tolerance during the time I was preparing this thesis, my friend D.R.M. Lwimbo for his encouragement and also my friends, members of the Greater Grace Ministry, for their spiritual support.

As the list of names for those who assisted me is not exhaustive, I would like to extend my appreciation to all those who have not been mentioned.
DEDICATION

This thesis is dedicated to my elder brother, Mbala Tshala Samuel, who passed away on 30th December 1973.
A seaport is fundamentally a central place of economic and cultural interchange; more specifically, it is a place where the mode of transportation changes from land to water-borne systems. As a modern node in a multimodal system, the essential function of a seaport is transport integration; but in performing this function, and for other reasons, a seaport may also become a major urban centre, an important source of employment, and an influential factor in regional and national development. Therefore, it is unwise to approach the problems of seaports in isolation.

The object of this project is to analyse the constraints to seaport development and the potentialities for seaport development in Zaire. The Zairean seaports are analysed in relation to the space economy of the hinterland they serve.

For a good understanding any seaport has to be considered in regional, national and international terms, and in relation to the various factors that influence its development and operations.

Increased understanding of the role of the Zairean seaports in relation to the Zairean economy will not necessarily lead to the panacea solution of any of the problems with which the ports are associated; but it will provide part of the essential background against which such problems can be assessed in a better way. Most of the specific aspects of the Zairean seaports are discussed here and are set within a broader appreciation of port problems and are used to illustrate ways in which the problems may be approached and analysed.
The work is based on studies made by European consultants and the reports received from the Zairean Port Authority. Throughout the study statistical data are mainly taken from international institutions, such as UNCTAD and the World Bank for the sake of objectivity. Nevertheless, the responsibility for remaining errors is my own and views expressed do not necessarily reflect those of the Zairean Authorities.

It is perfectly true that people directly involved in shipping, in port business and those looking at the cargoes know more about shipping and port planning than I do, but I hope that the project will be of a certain value for reference material and new issues raised on a well known subject in Zaire.

In this thesis an attempt is made to place the study of seaports within the overall context of transport systems and their relationships with development, but for limitation reason due to the fact that the work is dealing precisely with seaport problems and by lack of time the transport systems and their relationships with development are not analysed in details.
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INTRODUCTION

1 THE PROBLEM

Sea transport is the cheapest means by far of moving cargoes over long distances. As a consequence, the world economy has been knit together by seaborne trade routes.

With its continental dimensions, Zaire has only one maritime route which passes exclusively through the country, despite the fact that nearly 70% of Zairean imports and exports are carried by sea.

This route is called "La voie Nationale" (see map). It runs from the industrial Shaba province in the southern part of the country to the seaport area in the western part.

"La Voie Nationale" is the main transport route. It comprises a railway from Sakania in Shaba to Ilebo, then river transport from Ilebo to Kinshasa, the capital city, where goods are loaded once more onto the railway which goes to Matadi.

"La Voie Nationale" is 2,900 km long.

The seaports are the following:
- Matadi, which is at present the main port, is located on the left bank at the estuary of the Zaire River and is 139 km far from the Atlantic Ocean;
- Boma is the second biggest Zairean port and is situated on the right bank at the estuary of the Zaire River and is 80 km far from the Atlantic Ocean;
- BANANA is a small port but enjoys better geographical
THE ZAIREAN SEAPORTS

- State limit
- Region limit
- Roads
- Railways

Ports: Matadi, Boma and Banana

location, ie, on the Atlantic coast (at the mouth of the river);
Moanda is an oil terminal on the Atlantic Ocean.
The main Zairean ports are located at the estuary of the river.
Due to depth limitation of the berths, big ships with more than 27 feet of draft can neither call at Boma Port nor at Matadi Port.
Furthermore, the shortcomings of transport infrastructure on both the railway and the Zaire River on the national route and the long distance between the main production area in southern Zaire and the Zairean ports explain why only 50% of Zaire’s main export traffic (copper and zinc) pass through Zairean ports.
Until the end of 1975 an alternative to the use of Zairean ports was the use of the following ports located in neighbouring countries:
The port of Lobito in Angola (2,107 km away from the southern province of Zaire),
The East London and Durban ports in South Africa (3,464 km away from the southern province of Zaire),
The port of Beira in Mozambic (2,615 km away from the southern province of Zaire),
The port of Dar-es-Salaam in Tanzania (2,715 km away from Lubumbashi in the Southern province of Zaire).
Among these foreign ports the most profitable was the port of Lobito.
Unfortunately, in 1975 the bridge and a part of the Benguela railway linking the South of Zaire to Angola were destroyed as a consequence of the civil war which took place in this country after its accession to the independence. At the end of 1978, Zaire, except its own ports, could only use the port of Dar-es-Salaam and South African ports (East London and Durban).
However, the South African ports through which pass a significant amount of Zairean exports are both very far from Zaire and very expensive in spite of their efficiency.

The port of Dar-es-Salaam is not able to handle a big amount of Zairean cargoes for various reasons. Therefore, the only realistic solution for Zaire is to reduce to a great extent its dependence on foreign ports. This objective requires the improvement of the National Route so that Zairean ports can handle at least 70% of the Zairean maritime traffic.

The creation of a deep-water port at Banana on the Atlantic coast is proposed. This port is designed to be the main Zairean seaport. In addition to that, there will always be a need for an optimal use of foreign ports, namely: Lobito and Dar-es-Salaam.

As a consequence the following questions are worth answering:

1. What will be the place of this port vis-a-vis the two present biggest Zairean ports (Matadi and Boma)?
2. How will Banana port work vis-a-vis the foreign ports used presently by Zaire?
3. What about the size of the port and the infrastructure which will link the port to its hinterland?
4. What type of port administration is suitable to the new port?
5. How will the project be financed?
6. How will the port contribute to the economic development of the country?
7. What is the economic situation of the country and what will be its evolution?

This work is an attempt to find a solution to the
problem. It will comprise 3 chapters:

CHAPTER 1 CONTENT OF THE ZAIREAN PORT MASTER PLAN

SECTION 1 REHABILITATION PROGRAMME OF THE PRESENT BIGGEST ZAIREAN PORTS (MATADI AND BOMA)
1 Presentation of Matadi and Boma ports
2 The rehabilitation programme

SECTION 2 CREATION OF A DEEP-WATER PORT AT BANANA AS THE MAIN SEAPORT FOR ZAIRE’S EXTERNAL TRADE
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2 Location
3 Size of the port and infrastructure
4 Cargo-handling equipment
5 Kind of traffic
6 Types of ships
7 Link between the port and the hinterland and communication of the new port with Matadi and Boma ports

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Section 2 Geographical position
Section 3 Technical constraints
Section 4 Legal constraints (regulatory, legal stricto sensu and institutional)
stricto sensu and institutional)
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FOR PORT DEVELOPMENT

Section 1 Existence of minor Zairean ports on the Atlantic coast (Banana and Moanda)
Section 2 Wide, potentially rich and arable land (natural resources and minerals)
Section 3 Strategic location of the country and regional cooperation (CEAC, CEPGL, etc...)
Section 4 Increase of investments in the country
Section 5 Large population (manpower and consumer market)
Section 6 Existence of a free zone in the port areas with prosperous industries
Section 7 Infrastructure from the port areas to the hinterland

GENERAL CONCLUSION AND RECOMMENDATIONS

For a better understanding of the subject, following is the presentation of ZAIRE.
The Republic of Zaire has an area of 2,345,000 sq km (905,365 sq miles). It is the second largest country of sub-Saharan Africa. In spite of its area, Zaire is a disadvantaged country with regard to the sea. The coastline is only 40 km long (25 miles). It lies across the Equator. (1) Zaire has an equatorial climate in the entire central region and a tropical one in the rest of the country. It comprises, first and foremost, the basin of the Zaire River which has a deep tectonic origin. There are plateaus in the southern part of the country and mountains both in the western and eastern part. The equatorial forest covers approximately 1 million sq km of the total area. (2) In the North as in the South of the equatorial forest, tropical forest appears. Average temperatures range from 26 degrees C in the coastal and basin areas to 18 degrees C in the mountainous regions and in the south.
The natural resources of Zaire are immense. (3) The climate is favourable for agriculture and woodland. (4) The abundance of water should be useful to industry and agriculture. The network of waterways is naturally navigable. For over 1,600 km the Zaire River is navigable. Above the Stanley Falls the Zaire becomes the Lualaba, and is navigable along a 965 km stretch from Ubundu to Kindu and from Kongolo to Bukama. The Kasai River, a tributary of the Zaire River, is navigable by shipping as far as Ilebo, at which the railway from Sakania (southern Zaire) terminates. The country has a total length of inland waterways of 13,700 km. The Zaire River carries the second largest volume of water among the rivers in the world (5). The average flow to its mouth is 40,000 cubic meters per second. There are enormous possibilities for power generation. (6) Copper, tin, silver, uranium, cobalt, manganese, geranium, tungsten and coal are mined in the Shaba province. (7) Diamonds are found mainly in the Kasai province. Tin, columbite and gold are found in the East, at around Maniema. In addition, there are tremendous reserves of iron ore, bauxite, uranium, etc... (8)

B POPULATION

The population is estimated at 33.5 million of inhabitants.
It comprises numerous ethnic groups. The majority speaks Bantu languages. Nearly 70% of the population live in rural areas. The average density of population is low. The capital city, Kinshasa, has a population of 3 million inhabitants. Other important cities with large population are the following: Lubumbashi, Kisangani, Kananga, Mbuji-Mayi, Bukavu, Likasi, Kolwezi, Kikwit, Gbadolite, Goma, Bandundu, Kindu, Mbandaka and Matadi.

In 1985 the population work force amounted to 14 million with 13% working in mining and industries, 76% in agriculture and 11% in services. (9)

C ZAIREAN ECONOMY

Between 1968 and 1974, Zaire's real GROSS DOMESTIC PRODUCT (GDP) expanded at an average annual rate of 7%.

During the period 1975-80 the trend sharply reversed under falling prices for copper, coffee and diamonds and the impact of the so called "Zairianization" programme, under which industries, manufacturing and agricultural enterprises were either nationalized or put under the control of Zaireans without sufficient preparation and thus began to affect GDP performance.

By 1985 the annual inflation rate was settled at 20%. The IMF programme gave rise to a long succession of austerity measures. In 1986 the real growth was 0.5%. Since then, there has been a gradual improvement in the domestic growth. In 1987 the real GDP growth amounted to 1.5%.

In 1988 it amounted to 3%.

The projected growth in 1989 was 3.5%. (10)

The rate of inflation is very high.
The development plan pursues the following objectives: economic growth and creation of new infrastructure and industries such as a deep-water port at Banana and the new copper refinery in Kolwezi, etc...

The prevailing economic conditions led the government to delay the realization of most of the projects. An important obstacle to the development remains the inadequate infrastructure: road, rail, river transport and telecommunications.

However, among the hopeful projects for the 90s are the large transport rehabilitation project and the new copper refinery which is expected to operate in 1991. The two projects are being carried out now.

D RESOURCES AND INDUSTRIES

The country contains valuable hardwoods including mahogany and ebony. (11)

Commercial agriculture for export crops are: coffee, palm oil, rubber, cocoa, cotton and tea, although Cotton is no longer exported. (12)

However, it is Zaire's massive mineral and hydroelectric resources that make it one of Africa's potentially richest countries. (13)

The chief mineral region is the huge industrial complex in the Shaba province which is second in Africa to South Africa's Witwatersrand (14).

It includes Kolwezi, Likasi, Kipushi, Musoshi and Lubumbashi. The major industries are: agriculture, food stuffs, mining, oil refining, textiles, clothing and forestry (15).

The main exports are: copper, cobalt, coffee, diamond and timber.

The main commercial partners are: Belgium, Luxemburg, the
E TRANSPORT

Historically, the transport network comprises mainly the waterways from the Zaire River, its tributaries, and the Great Lacs (total length more or less 16,000km). This network has progressively been completed and extended where there are natural obstacles by railways (total length: 5,113 km). From there roads go all over the country. The road network is about 145,000 km long. Finally, the transport network has been completed by ports, Seaways and airways (16).

F POLITICAL SYSTEM AND ECONOMIC POLICY

1 POLITICAL SYSTEM

From 1885 to 1908 the State was created and was called "The Congo Free State". (17) Legally speaking, it was the property of the Belgian king Leopold Two.
From 1908 to 1960 Zaire was a Belgian colony under the name of "Belgian Congo".
In 1960 Zaire got its independence.
From 1960 to 1965 Zaire was a federal State with a parliamentary regime and a multy-party system.
From 1967 to the 24th of April 1990 Zaire was a one-party Republic. (18)
On the 24th of April 1990 a multy-party system was introduced with 3 political parties.
An orientation towards the 1960-65 political system has
2 ECONOMIC POLICY

Generally speaking, the Zairean economic policy is still liberal. Since 1885 an open door policy has been applied to the economy. It takes the form of mixed economy and privatisation as the IMF programme is being used. The monolithic position of some large public enterprises has been abolished. There are still State-owned enterprises in key economic sectors.
The Zairean Seaport master plan comprises:
- the rehabilitation of the present 2 biggest Zairean ports, namely Matadi and Boma ports;
- the creation of a deep-water port at Banana as the main seaport for Zaire’s external trade.

The plan has been prepared by the Zairean Government with the assistance of the WORLD BANK, the INTERNATIONAL MONETARY FUND and the AFRICAN DEVELOPMENT BANK for the rehabilitation programme and with the assistance of UNCTAD and France’s BUREAU CENTRAL D’EQUIPEMENT D’OUTRE-MER for the Banana project.

The rehabilitation programme is presently being carried out. Section 1 will deal with the rehabilitation programme of Matadi and Boma ports. The two ports are presented in the first paragraph and the rehabilitation programme is given in the second paragraph.

SECTION 1 REHABILITATION OF MATADI AND BOMA PORTS

1 PRESENTATION OF MATADI AND BOMA PORTS
1.1. MATADI PORT

DRAWING OF THE PORT

(See following page)

TIME: GMT+1
LOCATION:
- latitude 5 degrees 49' S
- longitude 13 degrees 27' E

At the moment, the port of Matadi is the biggest Zairean port. It was constructed in the early 20th century and was designed mainly for various import commodities and export of agricultural products and equatorial forest products. This means that the port was expected to serve mainly the western and the central parts of the country which used to be agricultural.

Mineral products which account for more than 70% of Zairean exports and equipment for southern Zaire were usually carried through Lobito Port due to the proximity and to an efficient railway connection between the mining Zairean region and Lobito.

It should be noted that at that time there was a good spirit of cooperation between the Belgian and the Portuguese colonizers.

In Matadi port cargo is not stored for a long period of time in order to avoid congestion.

Imported cargo is immediately re-forwarded to the interior while export cargo is only brought to Matadi a few days before the expected time of a vessel's arrival for which it has been booked.

Matadi Port handles about 1.3 million tons per year (oil excluded) with imports representing 62.78% while exports account for 37.22%.

There has been a decline in traffic since the port.
handled about 1.56 million metric tons of cargoes in 1955.

In 1980 the traffic dropped drastically to about 1.082 million metric tons for the following reasons:

1. The depth of the river berth and bassin is not enough with regard to the size of ships calling at the port,
2. Port competition among West and Central African ports,
3. Decline in Zairean agricultural products in the 60s.

In the recent past, port traffic has increased.

For the 1989 traffic, until the 15th of September 1989, the port traffic amounted to 1.23 million metric tons with 738,000 tons of imports and 462,000 tons of exports (Source: ONATRA report in "Jeune Afrique Economie", November 1989).

MATADI PORT TRAFFIC

<table>
<thead>
<tr>
<th>YEARS</th>
<th>EXPORTS</th>
<th>IMPORTS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>717,000</td>
<td>839,000</td>
<td>1,556,000</td>
</tr>
<tr>
<td>1969</td>
<td>572,000</td>
<td>541,000</td>
<td>1,113,000</td>
</tr>
<tr>
<td>1970</td>
<td>548,000</td>
<td>639,000</td>
<td>1,187,000</td>
</tr>
<tr>
<td>1980</td>
<td>418,522</td>
<td>663,706</td>
<td>1,082,258</td>
</tr>
<tr>
<td>1981</td>
<td>481,549</td>
<td>656,220</td>
<td>1,137,769</td>
</tr>
<tr>
<td>1982</td>
<td>486,710</td>
<td>666,559</td>
<td>1,153,269</td>
</tr>
<tr>
<td>1983</td>
<td>462,527</td>
<td>789,658</td>
<td>1,252,385</td>
</tr>
<tr>
<td>1984</td>
<td>509,004</td>
<td>858,602</td>
<td>1,367,606</td>
</tr>
<tr>
<td>1985</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Main Zairean imports: machinery, grain, cars and trucks (from Europe, Japan and South Korea mainly), general cargo (181,883 metric tons in 1984, 176,000 metric tons in 1983, a higher figure in 1982 of nearly 211,000 metric tons) and oil.

Main Zairean exports: copper (nearly 50% of the port traffic exports), logs and timber (16%), coffee (9.8%), cocoa, rubber, copal, bananas, manioc, groundnuts, palm kermels and crude oil.

Containerization

Container traffic has been steadily growing in the port of Matadi.

In 1983, it rose by about 22% over the 1983 level.

Container traffic represents a substantial amount of the port traffic.

Ships calling at the port:
- types: general cargo ships, container ships, tankers and car carriers,
- maximum size: 15,000 DWT,
- restricted draft: 28 feet.

From Matadi to Kinshasa there exists a railway line and a wide asphalted road.

There is a strong competition between the two transport modes in this section.

Road traffic is steadily increasing due to the advantage of a door to door service that it offers to customers.

"ONATRA" (the national office of transport), which is an autonomous public body, is responsible for port traffic ...
management and port administration. It has a special office dealing with port matters. Matadi Port has nearly 2,800 employees including port officers, managers, clerks and dockers. Pilotage and dredging are carried out by "LA REGIE DES VOIES MARITIMES" which is also a public autonomous body. ONATRA has legal monopoly for stevedoring, but private companies may be allowed to operate.
MATADI PORT EXPORT TRAFFIC

(000 METRIC TONS)

EXTRACTION PLOT

EXPORTS + RAIL, PORT, KIN (EXP)

YEARS

1938 379 369 419 449 469 479 498 519 529 539 549 619 649 679 699 719 729 759 779 799 819 849 879 89
MATADI PORT CONTAINER TRAFFIC IN TEUs

(1980-84)

**EXPORTS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of containers Loaded</th>
<th>Empty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>8,359</td>
<td>704</td>
</tr>
<tr>
<td>1981</td>
<td>7,750</td>
<td>2,016</td>
</tr>
<tr>
<td>1982</td>
<td>9,066</td>
<td>2,232</td>
</tr>
<tr>
<td>1983</td>
<td>9,201</td>
<td>3,037</td>
</tr>
<tr>
<td>1984</td>
<td>10,051</td>
<td>7,349</td>
</tr>
</tbody>
</table>

**IMPORTS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of containers Loaded</th>
<th>Empty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>8,298</td>
<td>2,337</td>
</tr>
<tr>
<td>1981</td>
<td>10,919</td>
<td>293</td>
</tr>
<tr>
<td>1982</td>
<td>12,517</td>
<td>157</td>
</tr>
<tr>
<td>1983</td>
<td>12,963</td>
<td>356</td>
</tr>
<tr>
<td>1984</td>
<td>15,293</td>
<td>2,444</td>
</tr>
</tbody>
</table>

Containerized cargoes in metric tons in 1984:
-Exports: 179,388 or 35.24% of the total port export traffic,
-Imports: 219,626 or 25.57% of the total port import traffic.

In 1980 there was an equilibrium between import container traffic and export container traffic. Since 1981 the import container traffic has become bigger than the export container traffic.


TREND OF COMPETITION BETWEEN ROAD AND RAILWAY TRANSPORTS FOR CONTAINER TRAFFIC

<table>
<thead>
<tr>
<th>Matadi-Kinshasa</th>
</tr>
</thead>
<tbody>
<tr>
<td>!--------------------</td>
</tr>
<tr>
<td>Total number of containers</td>
</tr>
<tr>
<td>Cont. carried by railway</td>
</tr>
<tr>
<td>Cont. carried by road</td>
</tr>
<tr>
<td>In TEUs</td>
</tr>
</tbody>
</table>

As it appears on the table from 1981 to 1984 container road traffic increased from 17.7% to 30.2%.
This is due to the advantage of door to door service offered by truck companies carrying goods from the port to Kinshasa, the capital city.

Source: BCEOM, Etude du Secteur Prive' dans Le
MATADI PORT FACILITIES AND EQUIPMENT

Total length (length of quays = 1,610 m): 1,728 m.
Dock density: 1000.
Restricted draft: 8.2 m.
Tidal variation: 1.82 m.
Berth utilization: 61 %

- General cargo /bulk berths:
  * Berth numbers 1, 2, 3 and 4 have lengths of 149 m, 161 m, 155 m and 158 m respectively.
  * Berth numbers 8, 9 and 10 have lengths of 149 m, 167 m and 143 m respectively (minimum depth of 10 m).
However, the maximum draft of vessels is restricted to 8.2 m up river and 7.9 m down river.

- Anglo-Ango pier 2 is 150 m long and is used for the handling of dangerous goods (flammable goods and explosives) and for accommodating vessels not powerful enough to pass "Devil's Cauldron".

- Container berths:
  Container traffic is handled at berths numbers 5, 6, and 7 of lengths 156 m, 176 m and 188 m respectively.
  There are 54,000 sq meters of stacking area and the
storage capacity is 3,200 TEUs.
-Barges’ berths: 400 m long.
-Tanker berths:
  - One alongside a pontoon which accommodates small tankers up to 8,000 DWT.
The terminal is connected to a pipeline running directly to MATADI AND KINSHASA.
Deep drafted tankers can be lightened at anchor between buoys 12 and 14 close to BANANA Port.
Tank-cleaning is done by barges.
- Storage/warehousing: 83,000 sq m.
- Open yard area: 60,000 sq m.
- Nearest railway: at the port.
- Nearest Airport: Tshimpi, 8 km far.
- Bunkering and fresh water are available.
- Limited repair facilities.
- Average load per day for three shift (1987): 2,733 metric tons

CRANES
------
The port has 57 cranes of which 53 have a lifting capacity of 3 to 6 tons each, 2 have a lifting capacity of 10 tons each, a floating crane with a lifting capacity of 14 tons, and 1 container crane with a lifting capacity of 25 tons. In addition, there is 1 fixed derrick with a lifting capacity of 50 tons (actual capacity 34 tons).

Bulk handling facilities
------------------------
There are palm oil installations at Ango-Ango.
In case of unavailability of berth, palm oil is loaded by barge of a capacity of 260 tons capacity at Matadi.
Cereals are discharged by suction at berth number 9 at the rate of 1,000 tons per hour. The port also has barges and other motorized equipment. Average time of stay of ships in port: 5.5 days. Average size of ships: 15,000 DWT with 28 feet of draft.

EXPLOITATION OF THE PORT OF MATADI

The Port Authority is facing the following problems in operating the port:
- distance from the Sea: Matadi is 139 km far away from the Atlantic Ocean;
- requirement of intensive dredging work,
- navigational hazards: rapids at "Chaudron de l'Enfer",
- limitation in the depth of the berths,
- inadequate quays for container traffic,
- the port presents no possibility for further development,
- risk of grounding for big ships calling at the port.

Nevertheless the port has adequate equipment.

Regarding the basic philosophy of the port administration, MATADI is a port which coming at the end of its development is content with its present situation and is trying to maintain the statu quo.
2 BOMA PORT

LOCATION: latitude 5 degrees 51' South.
    longitude 13 degrees 03' EAST.
TIME: GMT +1.
DOCK DENSITY: 1005.
TIDAL VARIATION: 1.8 m.

Boma is the second largest Zairean port.
It is a transit port. The port was especially designed and
built for timber trade. It is situated in the Mayumbe
District which contains abundant and valuable forest
products.

BOMA PORT TRAFFIC (in metric tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Imports</th>
<th>Total</th>
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<tbody>
<tr>
<td>1955</td>
<td>143,000</td>
<td>60,000</td>
<td>203,000</td>
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<tr>
<td>1969</td>
<td>112,000</td>
<td>61,000</td>
<td>173,000</td>
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<tr>
<td>1970</td>
<td>90,000</td>
<td>63,000</td>
<td>153,000</td>
</tr>
<tr>
<td>1980</td>
<td>62,882</td>
<td>16,368</td>
<td>79,250</td>
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</table>
1981   64,010  16,572  80,582  
1982   58,921  14,629  73,550  
1983   46,492  12,725  59,217  
1984   59,600  15,234  74,834  


As can be seen in the table above, there has been a drastic decline in the traffic after the accession of the country to the independence. The reason for the decline can be found in the rebellion and civil wars that took place in the country between 1960 and 1965.

As a consequence many forestry firms closed and most of the foreign investors left the country.

Secondly, the economic crisis that has hit Zaire since 1975 could not allow any improvement of the situation. Boma Port, located on the right bank of the river, is linked to Matadi Port, located on the left bank, by a newly built bridge which facilitate to a great extent cargo flow between the two ports.

The port has nearly 320 employees.

The "REGIE DES VOIES MARITIMES" is in charge of dredging, buoyage and pilotage.

The main cargoes passing through the port are the following: timber and general cargoes.

BOMA PORT FACILITIES AND EQUIPMENT

-----------------------------

Total quay length: 450 m.

BERTHING:
CRANES AND OTHER EQUIPMENT
---------------------------------
-8 cranes of which 6 have a lifting capacity of 3 to 6 tons each, 2 have a lifting capacity of 7.5 tons,
-5 banana conveyors,
-8 forklifts,
-1 palm kernel elevator,
-1 automatic grab,
In addition, the port has barges, pontoons, trucks and trailers.

TOWAGE
--------
The port has 2 tugs of 200 and 300 HP respectively.

REPAIR FACILITIES
-------------------
-Available for small vessels are:
  *1 floating dock: 65 m *16 m *9.6 m with a maximum lifting capacity of 1,524 tons,
  *1 floating dock: 76 m *18 m *6.25 m with a maximum lifting capacity of 2,540 tons.

NEAREST AIRPORT: Boma.

STORAGE AREA/ WAREHOUSING:
  Shed space of 6,000 sq m,
  An open space of 16,000 sq m.
In exploiting the port, ONATRA is facing similar problems as the Port of Matadi.
REHABILITATION PROGRAMMES

OF THE PORTS OF MATADI AND BOMA

Since port planning is part of the overall transport planning and the different transport modes on the national route are interdependent, the Rehabilitation Programme of the seaports constitutes an important part of the first transport sector rehabilitation project.

That is to say that seaports are being upgraded at the same time as improvements to rail and river components are being made.

A total 300 kilometres of mainline tracks are to be upgraded and new lineside equipment installed on the railway Matadi-Kinshasa.

Signalling is also being improved.

ONATRA is being provided with telecommunication and track maintenance equipment.

The Port of Kinshasa, inland river port on the Zaire River, and Ilebo Port on the Kasai River, a tributary of the Zaire River, are being upgraded.

Loading equipment and barges are being replaced (for details regarding cargo-handling equipment see chapter 1, section 1, paragraph 1).

In addition to this, signalling, telecommunications and track maintenance equipment, spare parts and management assistance are being provided for SNCZ which is running the railway section from Sakania in the Shaba Province to Ilebo.

The total cost of the programme amounts to 140.297 million
US dollars of which 21.345 million in local currency.
It comprises different projects.
The first transport sector rehabilitation project is
presently being implemented and is expected to stimulate
trade along the national route by facilitating the
transport of copper and making it easier for farmers to
ship produces to domestic and export markets.
The increasing bottlenecks on the national route have
affected the ability of the Zairean mineral producer,
GECAMINES to increase the volume of exports in recent
years.
It is worth mentioning that GECAMINES exports account for
280,000 metric tons a year out of the total exports
through the national route.
The contribution of the Zairean Port Authority to the
programme amounts to 66 million US dollars.
Co-financing of the programme is being provided by the
African Development Bank, Belgium, France's Caisse
Centrale de Cooperation Economic, Germany's Kreditanstalt
Fuer Wiederaufbau or "KFW".
The rehabilitation programme includes an institutional
reform element. This aims to cut the operating costs
incurred by ONATRA (the Zairean Port Authority) and to
improve its productivity.
Much more responsibility will be given to operational
units. Monitoring and evaluation will be done at a
central level. This means measure of productivity,
personnel management, cash-flow and cost analysis.
Computerization which was operational mainly at a central
level will be introduced at lower levels.
Regarding competition between road traffic, run by
independent operators, and railway traffic operated by
ONATRA between Kinshasa, the capital city, and the
port areas, the Zairean Port Authority is considering to take part in the road traffic. A plan to acquire trucks and trailers is being studied. The second rehabilitation programme will cover the period 1992-1995. Its total cost amounts to 144 million US dollars. Agreement on co-financing has already been reached. The programme concerns urgent objectives such as improvement to transport equipment, to the railway network, management efficiency through appropriate management procedures, data processing and personnel training. Emphasis will be put on the Seaport of Matadi and the inland river Port of Kinshasa on the national route.

(Sources: ONATRA report, 1989, see also AFRICAN ECONOMIC DIGEST, the 30th of January 1989, the 19th of June 1989 and the 24th of July 1989 issues and JEUNE AFRIQUE ECONOMIE No 125-November 1989).
SECTION 2 CREATION OF A DEEP-WATER PORT AT BANANA AS THE MAIN SEAPORT FOR ZAIRE’S EXTERNAL TRADE

For the moment BANANA including the MOANZA oil terminal is a small port on the Atlantic Ocean. The port of Banana is the future main Zairean port. It will be completed in the year 2000 and will comprise an ore terminal, an oil terminal and the present general cargo/bulk terminal.

1 THE PRESENT BANANA PORT INCLUDING THE MOANZA OIL TERMINAL

LOCATION

Latitude :6 degrees 01’ S .
Longitude :12 degrees 25’ E.
Time :GMT+1.
Maximum draft: 15.2m.
Dock density :1025.
Tidal variation : 1.6 m.
Prevailing winds :W’LY.

PILOTAGE

–Not compulsory, i.e. the river can be entered directly from the sea in deep water.
Tankers up to 30,000 DWT can be handled via barges at the anchorage berths between buoys 12 and 16 at the mouth of the river. These barges have a capacity of 2,050 cubic meters and can receive the cargo at a rate up to 400 tons per hour.

Zairean crude oil is loaded at the Monda terminal with an average API of 31.5.

Nearest airport: Kitona, 16 km away.

Bunkering is available and delivered through barges.

**2 BANANA PORT DEVELOPMENT SCHEME**

As mentioned before, BANANA is the future Zairean load center port. It is designed to progressively replace the port of Matadi. It already serves to a small extent as transit port for Matadi and Boma by necessity.

**1 WHY THE DEVELOPMENT OF BANANA PORT?**

The following reasons plead for the development of the port:

- Trend in ship size, necessity for a deep-water port for a country and the introduction of the "Round the World Service" in which big vessels (4,400 TEU) call only at selected ports where cargoes from various countries have been collected;

- The existing Zairean ports (MATADI and BOMA) can not cope with the present situation of international shipping: increase in ships size;

- The economy of the country, its size, its geopolitical situation call for a national deep-water port;

- The exploitation of Matadi and Boma ports requires an
intensive and expensive dredging.
Hence, the increase of shipping cost;
-Feeder services through neighbouring ports increase the cost for carrying goods because of the transhipment cost and additional shipping services.
Besides, there is a delay in the carriage of goods for the time spent in load center ports.
-For goods passing entirely through neighbouring countries documentation and high port cost are other obstacles: cargoes have to comply both with the national legislation and foreign legislations.

Various studies have been carried out (UNCTAD report, "The transport situation and prospects to open-up the Kivu Region", September 1981, "Feasibility Study of the Banana Deep-water Port", April 1981; "Voies Nationales et Voies Concurrentes", GET report 1982), highlighted these problems and came to the conclusion that the BANANA deep-water port project is worth undertaking.
Other external consultant: France's Bureau Central D'Equipement D'Outre-Mer, April 1980.
<table>
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<tr>
<td>per ton/km</td>
<td>100</td>
<td>closed</td>
<td>88</td>
</tr>
</tbody>
</table>

SOURCES: GET report 1982
EXTERNAL TRADE THROUGH FOREIGN PORTS
(in thousand metric tons 1980)

KIVU Region (Zaire)
Total exports 61
Total imports 49
Total traffic 110
Amount of goods carried through the National Route : 44.
Amount of goods carried through foreign ports (Dar-es-Salaam and Mombassa) : 66.

SHABA Region (Zaire)
Total exports 540
Total imports 630
Total traffic 1170
Amount of goods carried through the National Route : 441.
Amount of goods carried through foreign ports: 729 of which 688 through Durban and East-London.

It is to be noticed that the Kivu Region is the most important Zairean agricultural center.
Due to its landlocked situation, exports are also carried by cargo planes.
Hence, reducing farmers earnings.
As it can be seen on page 34 the Tanzanian route is the cheapest from the cost stand point for the Shaba Province.
From the foreign currency saving standpoint the National Route is the best solution. The South African route which is presently the external route most frequently used for opening-up landlocked areas was less expensive than the National Route in 1982 but it is now the most expensive. Even before it was not the best alternative from the foreign currency saving point of view. Furthermore, more than 50% of the exports and imports from the provinces without access to the sea are now carried through the national route. Less than 10% of the annual traffic of the Shaba Region is carried through the Tanzanian route. So, the “National Route” has proved its exclusive importance for the Zairean economy giving enough ground for the creation of the Banana Deep-Water Port. The increasing use of the South African route has reduced substantially the ability of Zairean shippers to make profits. For the reasons mentioned before as well as for reasons of political uncertainties (it has already happened with the vital Lobito route) in neighbouring countries and, more generally, for reasons of economic development, the creation of the deep-water port is a necessity. This project, together with the rational use of foreign ports, is the right solution for opening-up all the regions of the country.

2. LOCATION OF THE NEW BANANA DEEP-WATER PORT.

At the site of the present Banana port, i.e. at the mouth of the Zaire River on the Atlantic Ocean, the port will comprise in its final stage:
- an oil terminal,
- an ore terminal,
- a general cargo /bulk terminal,
- a container terminal,
- an oil terminal,
- a special berth and storage area for dangerous goods,
- a fishing terminal,
- a roll-on/roll-off center with a linkspan and a rampway,
- a floating dock,
- a stacking area with an area for container stuffing/stripping,
- reception facilities for tankers,
- an industrial area.

Note: in the previous plan shown on the following page there was a project of the creation of an aluminium plant in the industrial area where the SOZIR REFINERY is located, but the project has been abandoned.

3. ROUGH ESTIMATES OF THE SIZE OF THE NEW PORT.

In its early operational stage the features of the port may be as follows:
- Total quay length: 2,000 m.
- Area: 2.25 sq km.
- Terminals:
  * Ore terminal: 300 m of length with a maximum depth of 13.5 m,
  * Oil terminal: 300 m of length with a maximum depth of 17.5 m,
  * General cargo /bulk terminal,
  * Container terminal,
  * Special berth and storage area for dangerous goods.
The assumption is based on the situation of the present biggest Zairean port and the type of ships that may call at the new port taking into account the general trend in shipping.

4. CARGO-HANDLING EQUIPMENT IN THE EARLY STAGE OF THE PORT

Two solutions may be considered:

* First choice of technology:
  - 17 cranes with a maximum lifting capacity of 6 to 20 tons,
  - 1 container crane at least with a maximum lifting capacity of 45 tons.

* Second choice of technology:
  - A mobile multipurpose crane for handling of:
    - general cargo (with hook),
    - bulk cargo (with grab),
    - containers.

On the following pages different kinds of mobile cranes for beginner container terminals are shown (see for details Jean-Pierre Lannou, "Les différents types d'équipements de manutention conteneurs-mixtes-ro/ro", Le Havre 1985, p.8 and following).
GRUE POLYVALENTE POUR MANUTENTION

- de divers (au crochet)
- de vrac (benne hydroélectrique)
- de conteneurs (spreader automatique)
- de grumes (pince hydroélectrique)

Données techniques

Force de levage (sous crochet)
Portée correspondante
Portée minimale
Course de levage
- au-dessus du quai
- au-dessous du quai
Vitesses
- levage en charge de 15,5 T
- levage en charge de 21,5 T
- levage en charge de 24,5 T
- levage en charge de 33,5 T
- orientation
- relevage de flèche
- translation

Pouissance des moteurs
- levage
- orientation
- relevage de flèche
- translation

Poids total à vide
Déplacement horizontal de la charge
Fin de course de sécurité et dispositif (anti-surcharge)

15,5 T  18,5 T  21,5 T  24,5 T  33,5 T
37 m  31,5 m  28 m  25 m  20 m
10,6 m  26 m  20 m
1,33 m/s  0,86 m/s  0,63 m/s
1,50 t/mn-rpm  1,00 m/s  0,33 m/s
1 x 280 kW  2 x 33 kW  1 x 122 kW  3 x 9,5 kW
250 T

MULTIPURPOSE CRANE FOR HANDLING OF
- general cargo (with hook)
- bulk cargo (with grab)
- containers (with remote controlled spreader)
- logs (with remote controlled grab)

Technical data

Lifting capacity (below hook)
Corresponding maximum radius
Maximum radius
Vertical travel
- above quay level
- below quay level

Speeds
- lifting with loads up to 15,5 T
- lifting with loads up to 24,5 T
- lifting with loads up to 33,5 T
- slewing
- luffing
- travelling

Motors power
- hoisting
- slewing
- luffing
- travelling

Weight with no load
Limit switches and overload safety device

CAILLARD LEVAGE
Placae Caillard - 76065 LE HAVRE CEDEX 1368 (FRANCE)
Tel. (35) 25 81 31 - Telex 190616 F
Tableau des charges:

<table>
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<tr>
<th>R</th>
<th>F1</th>
<th>F2</th>
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<td>10.0</td>
<td>35.4</td>
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<td>11.0</td>
<td>33.3</td>
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R : Portée en m.
F1 : Force de levage fur à 3°
F2 : Force de levage fur à 10°

Pression d'appui des vérins en t

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<tr>
<td>D</td>
<td>70.0</td>
<td>29.0</td>
<td>14.0</td>
</tr>
</tbody>
</table>

13° Réactions en position de déplacement

30t 30t 24t 24t 20t 20t
Une grue automafrice portuaire à la hauteur.

Veuillez vous mettre en rapport avec:
LIEBHERR-WERK
EHINGEN GMBH
B.P. 1361
D-7830 Ehingen (Donau),
Tél. (73 91) 5 02-1, Téléx 71 783.
5. KIND OF TRAFFIC (cargoes):

- Ores: copper, cobalt, zinc, tin, manganese (manganese if not carried through the Lobito route);
- Oil: this may be the Zairean crude oil for export (small reserves) or mainly the import of oil for local consumption;
- Chemicals: import;
- Forest products: timber, rubber, etc...
- Agricultural products: coffee, cocoa, tea, etc...
- Cement: export to other African countries;
- Machinery, equipment and spare parts (imports).

6. TYPES OF SHIPS:

- Ore carriers,
- Bulk carriers,
- Car carriers,
- General cargo ships,
- Container-ships (1,822 to 3,045 TEU),
- Tankers (up to 200,000 DWT),
- Timber carriers.

The port should be able to accommodate PANAMAX (50,000 - 70,000 DWT).

These ideas are realistic because of the existing trade based on minerals, crude oil, coffee, timber and cocoa with the BENELUX countries, the USA, Canada and Japan.

For tankers, at present, 100,000 DWT tankers call at
the Moanda oil terminal.
So, considering a 200,000 DWT tanker calling at the Banana port when developed is reasonable.

7. LINK OF THE PORT WITH THE HINTERLAND AND COMMUNICATION OF BANANA WITH MATADI AND BOMA PORTS

a) Banana port with the hinterland, i.e., with Zairean production centers:
   - The present transport network (railway from Shaba to Ilebo, then the River Kasai from Ilebo to Kinshasa and railway again from Kinshasa to Matadi). This system may be improved with an extension of railway up to Banana (see for details "Etude de transport de la voie nationale" volume 1, BCECM, 1972);
   - Construction of a continuous railway from Shaba to Banana Port, the railway lay-out for the section Kinshasa-Ilebo which does not exist at present (it consists of navigable waterways) being straight or so called in French "trace' nord" (see also "Etude de transport de la voie nationale, volume 1, BCECM, Nov. 1972.

b) Banana Port - Matadi and Boma ports:

Communication through a feeder system by:
   - barge ships (1,000 -3,000 DWT) which can be connected together,
   - ro-ro ships.
NOTE

There is an important asphalted road connecting Banana to Matadi with a newly build suspended bridge on the Zaire River.

Banana is also linked to MOanda /SOZIR (oil refinery) by an asphalted road (21 km).

At present all the studies dealing with the national route consider only the route comprising the railway and the river running from Shaba to the port areas. "Office des Routes", which is a specialised office dealing with road planning, construction and maintenance, is of the opinion that the road running from the Shaba region to the seaport areas is also an important component of the overall national route, although it is not totally asphalted.

Nevertheless it is a reality and has to be considered carefully in the transport planning (1).

Finally, it would be of great importance to Zaire if the concept of national route which is, at present, limited to the communication between Shaba and the seaports is extended to the other regions, namely: Haut Zaire, Equateur, Maniema, Nord Kivu and Sud Kivu.

Since these regions are mainly agricultural, the improvement of communication will considerably increase exports of agricultural products.

Finally, with an adequate transport network, 75% of the total Zairean maritime traffic (nearly 3,000,000 metric tons of cargoes) may pass through Banana port when developed.

Traffic in the present Banana Port is steadily increasing as it already serves as transit port.

After the presentation of the Zairean Seaport Master Plan it is worth considering the constraints to port development. This subject will be dealt with in the following chapter.
CHAPTER 2 CONSTRAINTS TO SEAPORT DEVELOPMENT

There are many obstacles to the Zairean Seaport development.

For limitation reasons this work will look at the following constraints: historical, geographical, technical, legal, institutional and financial, including the need for adequate expertise.

SECTION 1 HISTORICAL CONSTRAINTS

Two points are made here:
(1) When was the main port designed and built?
(2) How its location, reasonable at that time, has led to the present situation?

The port of Matadi, 139 km far away from the Atlantic Ocean at the Zaire River estuary, was designed and constructed in the early 20th century during the colonial era to handle import commodities and export of agricultural products of the Belgian Congo (Zaire’s former name).
At that time the vessel size was generally small and as such they could reach the port of Matadi without difficulty.
In 1920 a big ship was 7,000 tons and tankers were not common\(^1\).

The need for a deep-water port was not foreseen.
Moreover, the main Zairean industrialised area in the south and the eastern part of the country were link to Lobito Port, South African ports (Durban and East-london) and Dar-es-Salaam.
The most profitable among the foreign ports for the Zairean external trade was Lobito.

The country's industrial development required many routes easing the movement of import and export of goods.
The search for a solution to overcome foreign route constraints led the colonial power to link the south and the east of Zaire to the Port of Matadi\(^2\).
At the end of 1978 for the reasons mentioned previously (see page 3) the main seaport for all the Zairean external trade became Matadi which was not designed for that.

As a consequence, this port was more and more developed until the need for a new outer seaport appeared.

At the other end, the trend in vessel sizes becoming bigger and bigger and the containerization traffic has demonstrated that the main Zairean seaport should have been a deep-water port located on the Atlantic coast.
Besides the historical constraints, there are also geographical obstacles.

**SECTION 2 GEOGRAPHICAL CONSTRAINT**

Two points are examined here:
(1) Narrowness of the maritime front,
(2) Navigation difficulties caused by the geophysical condition.

1 NARROWNESS OF THE MARITIME FRONT
--------------------------------------

The geographical constraint refers to the location of the country with regard to the sea. Zaire has an unfavourable geographical position in the African continent: it has a small strip of coastline of just 40 km on the Atlantic Ocean. The country is so vast and the terrain divided by rivers and forests that there is no adequate road system for its size and the only reliable link with distant provincial capitals is by air or sometimes by boat.

The southern and eastern parts of Zaire do not have direct access to the sea and are dependent on sending goods either south through the whole of the central and southern African rail system or by national route which means sending the goods by rail to the rail head at Ilebo where it then has to be transhipped by river barge to Kinshasa where it is put back on the railway to Matadi Port.

All these transhipments dramatically increase the costs of exports and imports of heavy machinery.

Finally, the whole market garden of eastern Zaire is not able to export products at competitive prices. For example, palm oil production (nearly 85,000 metric tons per year between 1981 and 1986) of which only a
small percentage is exported because the cost of transporting a ton of palm oil down river from Haut-Zaïre to Matadi from where it is exported is very high (3).

2 NAVIGATION DIFFICULTIES
--------------------------

The Port of Matadi is located at 139 km from the mouth of the river on its left bank. The Port is located in an area where there are many obstacles to navigation. The maritime section of the Zaire River consists of a narrow strip of land rising between the Atlantic Ocean and the mountaineous region at a distance of 140 kilometres (that is why the port can not be extended south). The maritime section of the Zaire River is divided into three important parts, namely:

(a) A narrow shipping lane from Matadi to a point called "Iles des Princes", 50 km in length. It is characterized by a river presenting steep banks and rapid currents. The strongest currents or "Chaudrons de L'enfer" are located 3 km downhill from Matadi;

(b) An extensive zone stretching some 66 km from the point called "Iles des Princes" to the "Pointe Ecossaise". In this section of the river, the sudden drop in speed of the current is a result of the difference in level between the upper and the lower parts of the river causing an important deposit of sand which continuously obstructs the navigational passage;

(c) A deep valley and creek zone between the "Pointe Ecossaise" and the mouth of the river (32).
The maritime section of the Zaire river has a limited draft of 32 feet (high tide) and tends to the decrease with the slight accumulation of sand. This unfortunate situation has, for years, necessitated high maintenance cost for good navigation. Dredging is regularly carried out in order to maintain the draft of 30 feet (4). The present transport situation of the country requires adequate transport infrastructure and equipment which does not exist. Hence, there are technical constraints.

SECTION 3 TECHNICAL CONSTRAINTS

Inadequate transport and communication infrastructure has proved a major handicap to Zaire's economic development. There are technical constraints on the national maritime route, road network, transport equipment, etc...

1 TECHNICAL CONSTRAINTS ON THE NATIONAL ROUTE

The national route, at present, is a link between the Zaïrean port area and the Shaba province. It consists of:
- a circuit of a railway from the Shaba province to Ilebo (central Zaïre),
- river transport from Ilebo to Kinshasa,
- another railway from Kinshasa to Matadi.

At the change of transport modes there are transhipments. As a consequence, there are delays in the carriage of goods and the costs incurred in transporting goods are
high (5).
Furthermore, there are inadequate quays for container traffic at the port of Matadi.

2 TECHNICAL CONSTRAINTS ON THE ROAD NETWORK

The existing road network is inadequate for a country of Zaire’s size: out of the estimated 145,000 km of roads only some 2,500 km are surfaced and most of the road network is not well maintained (see annex for road network) (6).

The road section between Matadi and Kinshasa was not designed for container traffic (heavy trucks and trailers).

However, the road network is one of the targets of the large transport rehabilitation project which is being carried out now.

3 TRANSPORT EQUIPMENT

For freight services operated on inland waterways between Kinshasa and Kisangani, the third city of Zaire, in the north-east most of the vessels are old, poorly maintained and the trip can take weeks (6b).

Hence, the increase in the total transport cost reducing the competitiveness of Zairean exporters.
SECTION 4 LEGAL AND INSTITUTIONAL CONSTRAINTS

This section comprises four paragraphs:

1. the legal regime,
2. the port planning process,
3. port administration in Zaire, and
4. port institutional development in Zaire.

1 THE LEGAL REGIME

Legal and institutional constraints to port development in Zaire are found in the legal regime applying to the Port Authority. The legal framework consists mainly of the parliamentary act number 78/002 of the 6th of January 1978 relating to the legal regime of public enterprises, the presidential decree number 78/206 of the 5th of May 1978 fixing the status of the Port Authority.

In spite of the fact that ONATRA, the Zairean Port Authority, is an autonomous body of a commercial nature, it is under the trusteeship of the minister of transport and communications for technical and administrative
matters, the trusteeship of the minister of economy and industries for pricing policies and the trusteeship of the minister of portfolio for financial affairs. The trusteeship means control which can be exercised upon the acts of the management committee of the Port Authority by three means:

- approval
  For example, the approval of the internal organization of work and the annual budget of the Port Authority;

- prerequisite authorization
  For example, for the conclusion of a market contract whose value is above Zaires (local currency) 100,000, borrowing, participation to the capital of other companies...

  (100,000 Zaires equal nearly 145,440 US Dollars taking into account inflation in Zaire from 1978 to 1990);

- opposition to the decisions taken by the Port Authority.
  Furthermore, the Port Authority has to comply with the port policy fixed by the Government and there may be a conflict of interests between the Port Authority and the policy makers who are not port professionals.

The port pricing is actually decided by the minister in charge of the national economy and industries although the initiative comes from the Port Authority. Consequently, the latter has to regularly approach the government for tariff adjustments which usually intervenes late while the port is facing a significant increase in operating costs.

2 PORT PLANNING

Here again, the Port Authority has a
restricted role.

Port development plans prepared by the Port Authority have to be integrated in the national development plan. That is to say there are three levels in the port planning process:

1. the preparation of the plan by the Port Authority,
2. the approval from the minister of transport and communications who is assisted in this task by the "Groupe d’Etude des Transports" (Study group of transport) which is a specialised office in charge of the integrated transport plan;
3. Approval of the plan by the minister in charge of planning.

As a consequence, there is a delay in carrying out development port projects even if such institutional arrangement may be suitable to Zaire because of its limited financial resources. The delay can take up to one year.

There is also sometimes an overlap of competency among the organisations involved in the planning process due to the fact that the task of each one has not been defined with accuracy.

The ministry in charge of national planning sometimes deals with the sectorial transport development plan. This explains the repercussion of the economic crisis on the transport sector in Africa and the fact that sometimes transport development plans are abandoned because of the economic crisis (7).

There is also an hierarchy in selecting the projects to be financed at the level of the central planning unit. This means that important projects for port development will not always be selected at the governmental level.

Coming back to the need for national port planning, the following arguments are put forward for its justification.
In recent years, the costs of constructing and equipping new ports have risen so much that they are now generally beyond the means of private enterprises. Municipality and statutory ports are similarly unable to raise sufficient funding for major developments. The only bodies with enough financial resources through loans (case of developing countries) are national governments.

Apart from purely financial considerations, however, the need for national port planning can be justified by the following factors:

First, because of the large investments in terms of human resources, it is essential that the best possible use is made of what is often a scarce commodity. The training of personnel in the latest developments in a rapidly changing industry can and does involve considerable time and expense;

Secondly, the free flow of both import and export cargoes dictates that there must be adequate provision for intermodal transportation. The national planning of ports can therefore not be considered in isolation but should be carried out against a background of an overall transport policy, which takes account of future developments as well as existing arrangements;

Thirdly, it is necessary to provide a means to measure the performance and efficiency of each individual part of the industry, in order to highlight any problems that may exist or come to light in the future. This also provides a valuable input into any studies concerning the need for additional facilities (8).

For an efficient national port planning process in Zaire the following recommendations are given: 1) At present, as all the seaports are managed by the
same body, ONATRA, the national port development should be, first of all, ONATRA's responsibility. This means the following steps (tasks):

* First, there is the manpower function involving the establishment of educational standards for the industry; the recruitment and training of suitable personnel and the identification of future manpower requirements to ensure the efficiency of the industry.
* Secondly, there is the planning function involving the collection of statistical data on existing operations, both nationally and internationally; the identification of future developments world-wide, economic planning, and the design of facilities to meet requirements.
* Thirdly, there is the research function which involves the measurement of the performance of existing facilities and research into improved methods of carrying out port operations.
* Fourthly, there is a technical function whereby the various disciplines involved in port operations provide an input into all future developments. (9)

2) The "Groupe d'Etudes de Transport" should be in charge of the integrated transport development plan and the formulation of the national transport policy, including port policies.

The port development plan prepared by the Port Authority should be a component of the integrated transport development plan.

So, there should be an exchange of information between the two organizations.

In practice, the exchange of information between the two organizations is done through working teams consisting of their delegates.
Up to now there is a good spirit of cooperation, but their relationship needs to be established by law.

3) The ministry in charge of the national development plan should only give general orientation for development projects and evaluate whether the port development plan and the integrated transport development plan fit in the national development plan or not. These views are also shared by the consultant Louis Berger in his report to the World Bank dealing with transport planning process in Zaire (see "Etude du GET et son ROLE dans la planification des transports au Zaire", volume 1, 1987).
Port management and port operations are entrusted to the so called "Office National des Transports", in short "ONATRA". The office is an autonomous body of commercial and industrial nature. It has legal personality. Its main bodies are:
- the board of governors,
- the management committee,
- the board of financial commissioners,
- five technical departments: waterways, ports, railway (Matadi-Kinshasa) and administration.

The activity of the Zairean Port Authority consists of exploiting rivers, railways, roads (Kinshasa-Matadi) and handling import and export cargoes (see presidential decree number 78/206 of the 5th of May 1978).

The Port Authority also performs transport services in the maritime section of the Zaire River (Banana-Boma-Matadi).

The Port Authority deals with a wide range of activities. Port management includes the seaport management, the inland river port management (Port of Kinshasa, etc...), railway management (Kinshasa-Matadi) and the management of transport services on the Zairean waterways (western Zaire).

Seaports, being a capital and labour intensive industry, should be given much more importance.

They should be run by a separate body for more
efficiency.
The port is a complex organization and the quality of the management, its form and structure are obvious keys to the various problems of this organization.
The technical and economic development of a port depend in the first instance on the foresight, experience and sound judgement of the managers.
Ports with a vigorous, enlightened and competent management, who can look beyond the horizon and use their initiative, prosper even under unfavourable geographic conditions, while established old ports are stifled by bureaucracy and by a maze of unrealistic regulations and are unable to take full advantage of the situation.
It should always be remembered that the port and its management must serve the best interest of the trade and economy of the country.
Port management has to be based on the following conceptual foundations of professional management:
1. scientific management of work as a key to increasing productivity,
2. autonomy and decentralization as a basic principal of progressive organization with a view to achieving optimum efficiency,
3. personnel development to meet the requirements of controlled and monitored organizational structures,
4. managerial development through a process of selection and training to meet the scientific and professional managerial needs of tomorrow,
5. managerial accounting (utilization of reliable and up-to-date data, fiscal analysis and information as the foundation of managerial decision making, achievable through a well
designed management information system.

6. marketing and the correct level of service to the customers and users,

7. long range planning supplemented by time-honoured economic, financial and technical criteria (10).

4 INSTITUTIONAL PORT DEVELOPMENT IN ZAIRE

It is essential that the port has a responsive and integrated organizational structure for its efficiency in a competitive business environment.

There are four basic categories of a port authority.

First, there is the authority that operates as part of the local municipality (for example, the ports of Rotterdam, Antwerp, etc...).

Secondly, there is the statutory port authority, which was established as an independent body by an act of government (for example, the Port of London).

Thirdly, there is the port authority established by private enterprises to serve a particular commercial need, such as the Port of Mistley in Southeast England.

Finally, there is the port authority established as part of a government department.

There is no single management model for the differing circumstances and environments prevailing in ports around the world.

Each country or port has to choose its own system.

There is, however, no doubt that an unwieldy and top heavy organizational structure with a lack of
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There is no single management model for the differing
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Each country or port has to choose its own system.
There is, however, no doubt that an unwieldy and
top heavy organizational structure with a lack of
delegation of authority for operations or a fragmented organizational structure is not conducive to efficient management.

A largely autonomous port authority unhindered by the procedures of the government in its day-to-day operations, and having delegation of authority within the organization to ensure both authority and accountability of line managers, is desirable. It is also necessary to develop efficient commercial accounting and costing systems (11). These views are also shared by the Zairean Port Authority management, but implementation is a long way off.

Realistic and flexible laws and regulations are needed for port efficiency.
SECTION 5 FINANCIAL CONSTRAINTS

The financial constraints will be analysed in two paragraphs:
-1 Brief presentation of the economic and financial situation of Zaire, the port financing process and the identification of the problem;
-2 Establishment of different scenarios for the Banana Project and sources of financing for the project.

1 BRIEF PRESENTATION OF THE ECONOMIC AND FINANCIAL SITUATION OF ZAIRE, THE PORT FINANCING PROCESS AND IDENTIFICATION OF THE FINANCIAL PROBLEM

1.1. Brief presentation of the economic and financial situation in Zaire

The population was estimated at 33 million inhabitants with a growth rate of 3%.
There is no real pressure on the immense land area, but urbanisation is taking place too fast for the government to cope in terms of jobs or services. The gross domestic product per head has been on the decline.
Agriculture, which accounted for 22% of GDP in 1965
rose compared with the trend in the rest of Africa, to 32% in 1985.
Mining grew from 20% of GDP in 1965 to 30% in 1985.
Two thirds of the population depends on agriculture for its livelihood, but the sector produced less than 15% of export earnings in 1984 (mostly coffee, palm products and rubber).
The reason for that lies in the inefficiency of the transport network.
The economy depends heavily on mining (copper, cobalt, diamonds and oil) in terms of State revenues and export earnings.
Since 1979 Zaire has been trying to restructure the economy under IMF tutelage.
It is involved in a vast programme of retrenchment and economic liberalisation so that it can pay off its external debt, restore private investments and resume its previous economic growth as in the 60s, which was the highest in Subsaharan Africa at that time.
Debts started to accumulate after the high spending of the early 1970s.
There has been an increase of the debt service:
- 12.8% of export earnings in 1979,
- 28.5% of export earnings in 1981,
- nearly 50% of export earnings in 1988.
The government obtains from time to time moratorium on due external debt and new loans are granted to the government mainly according to the IMF and World bank conditions.
At present, there is an improvement in the economy due to the following factors:
- improved production levels of the main export
commodities,
- significant increase in the price of the main exports (12).
As in most of developing countries, there was increasing and persistent macro-economic disorder in the 1980s with the following features:
- high and often fluctuating rates of inflation whose increase was particularly marked turning into hyperinflation during certain periods,
- a sharp decline in external resource transfers since the early 1980s owing, on the one hand, to worsened terms of trade and sharply increased interest rates, and, on the other hand, to cuts in new lending between 1981 and 1984 (net financial transfers i.e., net capital inflows minus interest payments, have turned sharply negative);
- collapse of economic growth as a result of deflationary adjustment to the loss of real revenues; this, together with the swing in external transfers led to drastic declines in resources available for domestic distribution and use;
- large swings in key relative prices: in the cause of adjustment the currency has been devaluated in order to raise profits in sectors producing tradeable goods and services relative to wages and to profits in non-tradeable goods sectors (13).
KEY ECONOMIC INDICATORS

INFLATION
IN % 37.2: 75.9: 52.2: 39: 46.7: 1

GDP REAL GROWTH
IN % -3.0: 1.2: 2.8: 2.5: 2.6: 1

FOREIGN DEBT
IN 1990: US $ 8.5 bn.

1.2. PORT FINANCING PROCESS IN ZAIRE
-----------------------------------------------
The costs for dredging are borne by the government.
The cost for infrastructure and superstructure are paid by the government which negotiates loans for port development projects with international financial institutions and main economic partner countries. However, the port usually intervenes in the financing of superstructures with its own financial resources.
The port development projects must get the approval of both the minister in charge of transport and communications and the minister in charge of the national development plan. The port revenues come from service charges and various dues.
The Port Authority is allowed to keep a part of its limited financial resources abroad in
hard currencies for repair and maintenance cost of port equipment and for future port development funding.

There is very little involvement of private operators, local banks and other Zairean financial institutions like the national insurance company (SONAS) in port financing.

Finally, it would be of great importance to the Zairean economy if the performing public enterprises can participate in the financing of port development projects.

This is possible for organizations such as "OGEFREM", the national shipper's council.

1.3. IDENTIFICATION OF THE FINANCIAL CONSTRAINTS

One of the most acute and endemic problems facing developing countries in general and Zaire particularly is the shortage of financial resources.

To most developing ports, investment capital for improvement of the infrastructure and acquisition of equipment is a major concern.

These ports also suffer from deficiencies in the management of operating capital, the setting of tariffs and the inability to contain costs, particularly in the present inflationary economic turmoil (14).

The Zairean Port Authority, as government institutions, does not have the autonomy or power to set its own tariff without reference to higher authorities.

Usually this leads to delays in tariff changes and may adversely affect the port's financial
Due to the limited financial resources, the prevailing economic situation and the necessity of flexibility for any development project, it is advisable to consider alternative solutions to the Banana Port Development Scheme discussed previously (see chapter 1). That is why three scenarios are made: the optimistic, the moderate, and the pessimistic scenarios.

2.1.1. OPTIMISTIC SCENARIO (see Banana Port Development Scheme)

Its main features are the following:
- total quay length: 2,000 m or 2 km,
- area: 2.25 sq.km,
- terminals:
  * ore terminal as a specialised terminal which will be 300 m long and will have a maximum depth of 13.5 m;
* oil terminal which will be 300 m long and will have a maximum depth of 17.5 m for accommodation of 100,000-200,000 dwt tankers;

* general cargo/bulk terminal which will be 300 m long and will have a maximum depth of 13.5 m for accommodation of Panamax ships (50,000-70,000 dwt);

* container terminal for ships carrying 1,825-3,045 TEUs (271 m x 32.2 m x 13 m);

* special berths for dangerous goods, including a storage area.

The assumption is based on the situation of the Zairean seaports, the volume of external trade that may pass through the national route in the future, and the type of ships that may call at the new port taking into account the general trend in shipping.

With regard to dry cargo fleet tonnage, the Panamax type constitutes the major portion of ships with a capacity of 40,000-80,000 dwt carrying grain, coal and iron ore as major transport cargoes.

The tonnage of this size of the bulk carriers will increase at a slow tempo when compared to those of other ship sizes.

It is therefore estimated that the volume will increase from 64.8 million dwt in the beginning of 1986 to 66.99 million dwt in 1990, 77.94 million dwt in 1995 and 84.88 million dwt in 2000 (15).

With regard to the tanker fleet and the capacity by size of ships, the total capacity of tankers of 200,000 dwt and over-centering on VLCCs, which now stands at 121.1 million dwt, accounting for approximately 50% of the total tanker fleet capacity was expected to fall below 100 million dwt after 1988, when the supply and
Fig. V-2-4  Dry Cargo Fleet Tonnage

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(Unit: million DWT)

Notes: Figure in ( ) correspond to Case II
### Fig. V-2-3 Volume of New order for Dry Cargo Fleet

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<td>9.2</td>
<td>9.9</td>
<td></td>
</tr>
</tbody>
</table>

Note: Figures in ( ) correspond to Case II.
Fig. V-1-4: Tanker Fleet Tonnage by Ship Size

(Unit: million DWT)

| Ship size      | Year | '86  | '87  | '88  | '89  | '90  | '91  | '92  | '93  | '94  | '95  | '96  | '97  | '98  | '99  | 2000 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Total          |      | 239.3| 222.9| 210.3| 191.1| 177.3| 171.2| 170.9| 174.0| 178.8| 185.1| 192.2| 199.9| 208.0| 216.3| 224.7|
| 200,000 DWT    |      | 121.1| 114.3| 98.7 | 84.7 | 74.4 | 69.6 | 70.0 | 74.2 | 80.1 | 87.2 | 94.3 | 101.2| 107.7| 113.8| 119.3|
| 100 - 200,000 DWT|      | 40.3 | 39.9 | 35.6 | 31.8 | 28.6 | 26.2 | 24.3 | 23.0 | 22.3 | 22.3 | 22.8 | 23.7 | 24.8 | 26.1 | 27.6 |
| 60 - 100,000 DWT|      | 39.1 | 40.2 | 39.1 | 38.5 | 38.4 | 39.0 | 39.6 | 39.7 | 39.3 | 39.0 | 38.9 | 39.1 | 39.5 | 40.1 |
| < 60,000 DWT   |      | 38.8 | 38.4 | 36.9 | 36.2 | 36.0 | 36.5 | 36.9 | 37.0 | 36.7 | 36.3 | 36.1 | 36.1 | 36.3 | 36.9 | 37.6 |

Note: Figures in ( ) correspond to Case II.

JMBR
## Fig. V-1-3 Volume of New Orders for Tanker Fleet by Ship Size

### (Unit: million DWT)

<table>
<thead>
<tr>
<th>Ship size</th>
<th>Year</th>
<th>'86</th>
<th>'87</th>
<th>'88</th>
<th>'89</th>
<th>'90</th>
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<th>'97</th>
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<th>'99</th>
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<td>5.0</td>
<td>8.2</td>
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<td>200,000 DWT-</td>
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<td>60 – 100,000 DWT</td>
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</tr>
<tr>
<td>&lt; 60,000 DWT</td>
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<td>(1.1)</td>
<td>(1.6)</td>
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<td>(1.1)</td>
<td>(1.6)</td>
<td>(2.2)</td>
<td>(2.8)</td>
<td>(3.2)</td>
<td>(3.6)</td>
<td>(3.8)</td>
<td>(3.9)</td>
</tr>
</tbody>
</table>

**Note:** Figures in ( ) correspond to Case II.
demand balance is about to become even. This down trend is expected to continue until the middle of the 1990s, and it will be the latter part of the 1990’s when the trend will take an upward turn though gradually.

Inasmuch as the demand for VLCCs and others is expected to rise about that time due to the expected recovery in the share of the Middle-East OPEC oil, there exists a possibility of the pace of growth in the capacity becoming much faster than is calculated by the simulation (16).

ROUGH ESTIMATES OF THE TOTAL COST:
US Dollars 130 million.

2.1.2. MODERATE SCENARIO

The moderate scenario for the project may be characterised as follows:
- total quay length: 1,500 m or 1.5 km;
- ore terminal accommodating 45,000 dwt ships with a maximum draft of 11 m;
- oil terminal for maximum ship size of 150,000 dwt;
- general cargo / bulk terminal for maximum ship size of 50,000 dwt;
- container terminal for ships carrying 716 to 1,825 TEUs (242 m x 32.2 m x 10 m);
- special berths and storage area for dangerous cargoes.

ROUGH ESTIMATES OF THE TOTAL COST:
US Dollars 100 million.
2.1.3. PESSIMISTIC SCENARIO

In case of insufficient financial resources required for undertaking the project as defined in the previous scenarios the solution may be the following:

* a multipurpose terminal with multipurpose cranes for general, bulk and containerized cargoes;
* arrangement of the present Moanda oil terminal in such a way that it can accommodate 100,000 dwt tankers (maximum ship size) both for Zairean crude oil export and for oil (or oil products) imported to Zaire;
* in addition to the terminal, there will be reception facilities for tankers;
* special berth and storage area for dangerous cargoes.

ROUGH ESTIMATE OF THE TOTAL COSTS:

US Dollars 65 million.
2.2. POSSIBLE SOURCES OF FINANCING FOR THE PROJECT

It is important to bear in mind that the government will continue to play an important role for such a project in Zaire. Nevertheless, public-private partnership is the best solution.

The sharing of responsibilities may be as follows:
- costs for economic and technical studies (much of which has already been done), for dredging and infrastructure to be borne by the government and the Zairean Port Authority;
- costs for superstructure to be borne by private operators, namely: important shippers, oil companies and the Zairean Shipping Line.

Internal and external sources for project funding may be considered.

2.2.1. Internal sources

Among the internal sources the following means deserve mentioning:

* the investment budget of the government,
* reserves from the Zairean Port Authority,
* financial participation of other organizations such as:
  - OGEFREM which plays the role of shipper's council and is responsible for promoting the Zairean maritime industry;
  the fact is that this organization makes
important profits which can be usefully used for development projects;
- "GECAMINES COMMERCIAL" which is a branch of "GECAMINES", the Zairean mineral producer, and responsible for selling minerals and mineral products;
needless to mention that "GECAMINES COMMERCIAL" owns shares in the capital of the "NOUVELLE BANQUE DE KINSHASA", a commercial bank;
- "SOFIDE" which is a development bank financing economic projects in Zaire.

2.2.2.EXTERNAL SOURCES FOR FINANCING

The external sources should come in support of internal sources. They will depend on the seriousness of the government in the preparation of the project.
In this context two sources can be identified: multilateral development agencies and bilateral arrangements (17).

2.2.2.1. Multilateral development agencies

2.2.2.1.1. The World Bank Group: the International Development Agency (IDA).

Most of its loans are for specific development projects and sector investment programmes in a variety of areas such as transportation, energy, agriculture, etc...
Loans through IDA for the poorest countries are known as credits since they are interest free but bear a 0.75% commitment charge and have a pay-back period of up to
fifty years.
The bank places major emphasis on appraisal procedures to ensure that the funds will be applied to high priority needs, will provide a satisfactory economic rate of return and complete cost recovery where possible, and will be technically sound.
The average loan is now about US Dollars 50 million for a total investment of US Dollars 140 million.
Bank-assisted projects can have an important demonstration effect and can encourage other investors to supplement bank lending (i.e., commercial banks) with their own, as cofinanciers or separately.

2.2.2.1.2. The European Investment Bank

The bank has come to play an important part in providing development finance in countries outside the EEC which have signed association or cooperation agreements with the community (Zaire is an ACP country).
Interest rates are usually within the 5-8% band, cover a maximum of 50% of fixed asset costs and are conditional on mobilization of funds from other sources.
The bank also administers for the EDF (European Development Fund) a form of funding known as risk capital assistance which is often used to finance project preparation, development studies and other costs associated with a project prior to its eligibility for disbursements under a project loan.

2.2.2.1.3. The African Development Bank

The bank finances projects which concern only member States, i.e.
African countries. The project should make economies increasingly complementary or expand foreign trade. The bank selects, studies and prepares projects, promotes the investment of public and private capital and provides technical assistance. The African Development Fund was established in 1973 to assist the bank to provide African countries with loans on concessional terms. These loans have a maturity of 40 years with a grace period of ten years included.

2.2.2.2. BILATERAL ARRANGEMENTS

Loans may be sought also from the main commercial partners countries which have important economic interests in Zaire, e.g. Belgium.
SECTION 6 THE NEED FOR ADEQUATE EXPERTISE

1 GENERAL CONSIDERATIONS
-------------------------

The Zairean Port Authority has quite a long experience in port management (nearly 50 years). A significant progress has been achieved in some aspects of port business. For example, the establishment of a port training center in Zaire for dockers, truck drivers, other port employees and for refresher courses. In addition to this, there is a regular training of both top managers and supervisors of different port services in Belgium.

All these projects are carried out with the assistance of the "Antwerp Port Engineering and Consulting" and the Belgian Cooperation.

However, a lot of things need to be done. Like in other developing countries the Port Authority often faces shortage of qualified professional port managers, engineers and supervisors.

The rate of change in ship handling, cargo packing and handling techniques is rapid and staff skills need considerable upgrading.

Regular training of port managers, supervisors and labour and the upgrading of professional skills is thus
essential for efficient operations and high productivity. The training of staff in multi-disciplinary skills also allows more flexible development. Visits by senior professional staff to ports in developed countries could be useful. Managerial and professional courses conducted by the local universities, businesses, professional institutes and special courses organised by UNCTAD, ILO and IMO could be of great value (18).

2 PLANNING AND DEVELOPMENT
-----------------------

In order to carry out proper planning, it is necessary to have a trained technical staff. This investment is necessary so as to avoid mistakes and miscarriages in the development of the port. There is a tendency to shift this responsibility onto consultants and have recourse to turn-key projects in Zaire. This can lead to a danger both from the financial and functional point of view. Planning and development staff should be able to define the aims, objects and parameters of a project. This homework having been done, consultants can be brought in to develop the project, with the control remaining in the hands of the Port Authority. The planning process should also include training and the transfer of technology. Planned preventative maintenance packages should be developed for the new equipment being acquired for the port. Attention should also be paid to the environmental requirements when preparing plans for developments (19).
The collection and processing of operational and financial data and the production of appropriate control statements for supervisory staff and management serves as an important tool for monitoring the operational performance in the search for optimum levels of efficiency and reduced costs. The Zairean Port Authority, like other ports in developing countries should, therefore, institute management information systems or MIS in short.

In the past, when operations were slow, the pace of information processing and decision making could be carried out leisurely, but when ships have high waiting time costs, even a few hours saved in turnaround time can be important. Computerization of MIS expedites the processing of data and decision making.

Such a system is required nowadays in general for port operations and much more for container terminals where quick decisions have to be taken and multiple pieces of information about receipts are received, processed and transmitted (20).

In spite of the constraints identified in the preceding pages there are many potentialities for seaport development in Zaire. The subject is discussed in chapter 3.
The relative success of a port, measured in terms of its commercial importance as a modern transport mode, is influenced by several groups of factors:
- the trade potential of the hinterland,
- the land transport system,
- relationships with the foreland, including the pattern of sea transport links (oversea markets),
- the institutional framework at the level of port administration and at the level of national and intergovernmental organisation.

These factors operate in several dimensions — physical, economic, political, technological — on differing scales and over varying time periods.

They do not include, however, the physical conditions within the immediate port area, which influence the pattern rather than the level of port growth (1).

This chapter seeks to clarify some of the physical and human environmental factors affecting the general level of port activities in Zaire, and more particularly to explain the local factors that may influence the pattern of port development.

It will comprise the following sections:

Section 1 Outlook of the overall Zairean economy for the 90s and its consequence on maritime transport,

Section 2 Existence of minor Zairean ports on the
Atlantic coast,
Section 3 Wide, potentially rich and arable land,
Section 4 Strategic location of the country and regional cooperation,
Section 5 Large population,
Section 6 Existence of a free zone in the port with prosperous industries,
Section 7 Infrastructure from the seaport areas to the hinterland.
SECTION 1 OUTLOOK OF THE OVERALL ZAIREAN ECONOMY FOR THE 90s AND ITS CONSEQUENCE ON FOREIGN TRADE AND MARITIME TRANSPORT

The economic prospects look relatively bright for 1989-90. In 1989 inflation was lower than in 1988, thus easing pressure on the currency and containing the upward drift of the debt burden.

Sudden increased availability of foreign exchange in 1989 resulting from the increase of export commodity prices and the liberalisation policy should help boost private sector activities, both production and investment.

Increased receipts from copper exports in 1989, cobalt in 1990, gold and diamonds should allow the government to keep to the terms of the 1989-90 IMF agreement and thus ensure a reasonable inflow of funds in 1990.

The raising of public sector wages should help to ease the local opposition to austerity.

With the expected slowdown in the industrialised economies in 1990, copper prices could slacken.

The medium-term and long-term prospects are much brighter. Major investment programmes will bear fruit in the medium to long term and should provide lasting benefit, but in the meantime, Zaire needs to reschedule and reduce its external debt burden.

Major investment programmes are now under way in all key sectors and attention has also been given to regional development and import substitution in this vast country. Export industries such as copper and gold are being
strengthened and there is a potential for increasing significantly oil income with the recent discovery of important oil reserves in eastern Zaire in addition to the existing reserves located off the Atlantic coastline and in the Zaire River estuary.

The preceding forecast is based upon two assumptions:
- political stability in the country,
- consistency in foreign policy vis-à-vis the main economic partner countries, mainly the EEC.

The general trend of the Zairean economy will have a consequence on foreign trade:
- imports will remain strong on account of investment programmes under way,
- exports will be strengthened as a consequence of the major investments in key economic sectors and diversification of exports (2).

With regard to new investments, the following projects are worth mentioning:
- the large transport rehabilitation programme,
- machinery modernisation at the UTEXAFRICA textiles consortium,
- new copper refinery which will come on stream in 1991,
- GECAMINES (Zairean mining corporation) modernisation programme,
- modernisation of the gold producer company (KILOMOTO)
- promotion of the forestry industry with the assistance of Canadians (FORESCOM) and Germans (SIFORZAL)
SECTION 2 EXISTENCE OF MINOR ZAIREAN PORTS ON THE ATLANTIC COAST

As already mentioned in the first chapter Zaire has two minor ports on the Atlantic ocean:

*Banana commercial port:
  - general cargo/bulk berth with a length of 75m
  - Banana serves at present mainly as lighterage center for big ships calling at Matadi.

*Moanda oil terminal: SBM accommodating tankers up to 100,000dwt for Zairean crude oil export.

Given the limited coastline of 40 km that the country has and the real need for a national deep-water port, these two small ports should be developed as a multifunctional port complex (Complexe Portuaire BANANA-MOANDA).

The hinterland will be all this vast country which generates sufficient maritime traffic, no matter how the trend of the national economy will be.
SECTION 3 WIDE, POTENTIALLY RICH AND ARABLE LAND

Zaire is a vast country: it has a total land area of 2,345,000 sq km. This means a vast hinterland for Zairean seaports. The equatorial forest covers approximately 1 million sq km of the total area. The natural resources of Zaire are immense (see map on the following page). The climate is favourable for agriculture and woodland. The abundance of water should be useful to industry and agriculture (3). In this section the potential for development of the mining industry, the forestry industry, agriculture and manufacturing with its consequences on seaport development in Zaire is assessed.

1 MINING

Zaire is the world's biggest producer of cobalt (10,000 tonnes in 1987), the second largest producer of industrial diamonds (23.5 million carats in 1987) and the fourth largest copper supplier for the western world. It also mines large quantities of zinc, tin and gold. There is also small-scale mining of cadmium, cassiterite, silver, geranium and wolframite.
With regard to the mining policy, the government is in favour of vertical integration instead of increasing the production (e.g. the copper industry).
The copper production has been stabilised at around 450,000 metric tons per year.
The reserves are still abundant.
A recent study of copper developments during the 1990s by Commodities Research Ltd indicates that the tonnage of copper from the 27 most significant new copper developments, at present under consideration, and which could be brought on stream by the year 2000 will not be sufficient to offset closures and match expected growth.
The new developments will increase capacity by 1.615 million tonnes.
World consumption has been growing at a steady rate of 3.4% a year since 1985, while mine production to end-1995 is slated to grow at only 2.6% and after 1995 this will drop to 0.4%.
Even if copper consumption growth slows to 2.5%,
Commodities Research estimates that a further 850-900,000 tonnes of capacity will be needed to meet world demand (4).
This means that if there is a decrease in copper prices it will not be important.
Cobalt will probably follow a similar trend.
Manganese production does not present a big importance for the national route due to the fact that it is mined in a locality situated near the Port of Lobito (south-western Zaire).
The production of tain by ZAIRE-ETAIN and SOMINKI has an importance for the national route.
Petroleum is produced both on and offshore at the mouth of the Zaire River.
It became Zaire's second most important export earner.
after copper at the beginning of the 1980s. The main producer is led by CHEVRON of USA with 50% and TEIKOKU of JAPAN with 32%. Production has gradually been increasing from 7.4 million barrels a day in 1987 to 9.9 million in 1984 and is expected to remain at this level.

A second producer, smaller consortium Zairep works onshore and is owned 56% by Petrofina and 44% by Shell. It has been investing heavily and output increased from 200,000 b/d in 1981 to 1.9 million in 1984 with a projected peak of 3.2 million in 1986.

Indications of oil deposits have also been discovered along the extreme eastern frontier between Zaire and Ouganda. Exploration is underway. The geophysical exploration is being carried out at present. Several leading oil companies have showed an interest, but Petrofina remains one of the leading interested parties.

Aerial surveys along the 1,500-kilometre stretch from Nimule in Sudan to Lake Edward have indicated evidence of hydro-carbons, with a concentration in the Lake Albert basin.

Nevertheless, due to the location of the deposits, this recent find will hardly contribute to the development of the Zairean seaports (5).

Eventually, the important reserves of iron ore in the regions of Shaba (Tenke-Fungurume), Kasai occidental (Ilebo) and Haut-Zaire (Mungbere) represent another potentiality for seaport development in Zaire (5 bis).
2. FORESTRY INDUSTRY

Zaire’s vast forest potential has been recognised late. SIFORZAL, a company jointly owned by West Germany interests and the government, has been cutting timber since 1973 and production has increased gradually over the last decade.

The state-owned FORESCOM company managed by the Canadians has been investing heavily.

Zaire is the country with the richest forestry potential in all Africa.

The vast majority of Zaire’s forests are located in the central part of the country in the remote Equator Province. Unfortunately, the lack of adequate transportation facilities, port infrastructure, trained personnel and capital has seriously shackled the development of the nation’s high-potential forestry sector.

Even if only 75 per cent of Zaire’s forests are commercially accessible, industry sources project that the sustainable yield could be close to 9 million cubic metres per year.

A more systematic and rational working of Zaire’s forestry wealth could provide the country with additional export revenues to the order of US dollars 350 million a year.
However, under present conditions forestry is rather marginal to the Zairean economy. Efforts are being made to improve roads and ports and force forestry companies to take better advantage of this huge and renewable forestry resource. Developing Zaire's forestry industry must be envisaged in the long-term perspective. If efficiently worked, Zaire's forests could provide considerable earnings that could underpin economic growth in the 1990s and beyond (6).

3. AGRICULTURE

Zaire has an enormous agricultural potential (7). Before independence, it was self-sufficient in foodstuffs, and agricultural exports from plantations owned mostly by Belgians accounted for more than 40% of export earnings compared with 15% in 1984. Since 1960, the country has become importer of cereals (320,000 t in 1984). Food imports have been costly, absorbing US dollars 54 million for maize imports from South Africa and the USA in 1983.

Most tropical staple foodstuffs can be grown in Zaire. The only major problem is the breakdown in communications since independence. This means that farmers have mostly been growing for their own needs in localised areas. The foreign commercial farmers have departed, leaving a vacuum that has not been filled properly by the Zaireans. The government invited former owners to return after 1977 but had few takers. However, there have been limited successes.
Maize production is increasing under a US-AID programme in Shaba. Cotton production has fulfilled the needs of local textile factories since 1962 and foreign assisted schemes have brought sugar production to the point of national self-sufficiency. There are three main sugar factories: Kiliba in the Kivu Region, Kwilu-Ngongo in the Bas-Zaire Region and another one in the Haut-Zaire Region.

Coffee is the main export earner. Most of it is grown by small producers but the best quality coffee is produced by the larger plantations like Plantations Lever in Zaire (PLZ) situated in the Region of the Equator. Robusta production, accounting for 90% of the total, was static at about 65,000 t per year in the first half of the 1980s.

Arabica production at over 6,000 t is wholly exported. The production of palm produce is a small fraction of what it was in the 1960s. The decline continued in the 1980s from 33,900 metric tons in 1981 to 23,000 metric tons in 1984. PLZ, the leading producer, has embarked on a massive investment programme, but unless this is matched by other producers, it will be insufficient to reverse the overall decline (6).

4. Manufacturing

Zaire has a relatively highly developed manufacturing sector by the standards of the rest of black Africa.

However, its share of the GDP has fallen from 17% in 1965 to 2% in 1985, according to the World Bank figures. It is worth mentioning that the period 1979-85 was very hard for the country.

Since then, there has been a slight improvement. Zaire has adopted fairly liberal investment codes, but the attempt of "Zaireanisation" (see page 6) in the 1970s
and difficulties in securing foreign exchange for spares and raw materials and the problem of successive devaluations have all militated against steady development. The sector is dominated by the leading multinationals, which concentrate on processing consumer goods for the local market in such products as food processing, textiles, shoes, bicycles, vehicle assembly, soap, paints, brewing and soft drinks.

There are a few capital goods producers based on local raw materials such as timber, iron and steel, foundry goods, and sulphuric acid and explosives for the chemical industry.

Cement is the main export with regard to the manufacturing sector which is mainly concentrated in Kinshasa, the Shaba Region (Lubumbashi) and the Haut-Zaïre Region (Kisangani) where the market is the largest, communications are generally good and cheap power is available (9).

The development of the different industries mentioned above will certainly play an important role in the Zairean port development in terms of imports of raw materials from other countries and exports of both manufactured or semi-manufactured goods produced in Zaïre. Besides, the strategic location of the country in Africa is an important factor to take into account.
SECTION 4 STRATEGIC LOCATION
OF THE COUNTRY
AND REGIONAL COOPERATION

The strategic location is considered in the economic context. Zaire is located at the real center of the African continent. Its railways are connected to southern Africa.

There are commercial contacts between Zairean businessmen and their colleagues from southern African countries. Zaire is member state of the economic community of the great lake countries or CEPGL in short together with Rwanda and Burundi.

This community has important economic projects of common interest for the three countries.

That is why a small amount of goods is imported to Rwanda and Burundi through the Zairean national route.

The existence of reliable air transport services between the three countries may facilitate the use of the Zairean seaports by Rwanda and Burundi.

The trend towards intermodal transport where cargoes are moved by sea, land transport and air transport supports
this idea.

Zaire is also a member of the Economic Community of the Central African states but this organization is at present not efficient enough to be considered as a potentiality for seaport development in Zaire. This organisation like the Economic Community of the great lake countries but at a larger scale has the following goals:

- Integration of economies of its member states, namely Cameroun, Gabon, Congo-Brazzaville, Rwanda, Burundi, Tchad, the Central African Republic and Zaire;

- Suppression of customs barriers among member states.

If this organisation becomes reality and operational it should be taken into account among the seaport development factors.
Zaire had an estimated population of 34 million inhabitants in 1988. This represents in itself a considerable local consumer market in terms of imports. One may mention that Zaire is a low-income country and this militates against the existence of a considerable internal market.

The importance of the per capita income factor should not be overestimated in a country like Zaire where the economic and financial activity is not really apprehended due to the inadequate statistical data, to the inefficiency of the public finance administration and to the importance of fraud in economic affairs. Experts dealing with the problems of the Third World propose the use of the criterium of national resources for measuring the economic activity in developing countries (10).

The large number of Zaireans dealing with important businesses like diamond and gold trading companies compensate the low per capita income. The existence of informal activities contributing to the welfare of the population unknown by the government should be mentioned. In addition, there are many foreign businessmen and foreign workers employed by Zairean companies who receive very high salaries and consume generally imported goods.
The large population in Zaire also has an effect on the labour cost which is low with regard to dock work.
SECTION 6 EXISTENCE OF A FREE ZONE IN THE PORT AREA WITH PROSPEROUS INDUSTRIES

There is a free zone in the port areas called "Inga Free Zone". It has been created in order to encourage the establishment of industries in the port areas where there is availability of abundant electricity energy (Inga Power Plant).

The concept of free zone is a response to the evolution of international trade which requires facilities especially adjusted to international exchanges.

The Inga Free Zone constitutes an industrial area designed as basis for duty-free transit and processing.

The free zone makes it possible to store, to prepare and to add value to all products coming mainly from abroad. Products are placed outside the Zairean regulation.

Being an onshore extension of the ship's hold, the free zone gives operators the possibility of working on the international market from the port.

The operators are also exempted from fiscal contributions on the equipment imported for business purposes over a certain period of time.

The operator's authorization is given by the administration of the Inga Free Zone according to the law (12).

The types of industries established in the zone are
the following: cement industries, mill, steel plant, oil refinery, crude oil exploitation, etc...
For the moment, these industries contribute to port development by the important volume of import of raw materials needed.
The only important export oriented industry is the oil industry.
All these industries need a good transport infrastructure for the movement of goods.
SECTION 7 INFRASTRUCTURE FROM THE SEAPORT AREAS TO THE HINTERLAND

The Zairean inland transport system - road, inland shipping and railways - is not adequate and as such needs to be rehabilitated.

Nevertheless, the infrastructure does exist and contributes in a limited manner to the movement of cargoes all over the country.

It comprises mainly the following elements:

- 13,700 km of inland waterways including the Zaire River which is navigable for over 1,600 km and links the regions of Haut-Zaïre and Equateur with the city of Kinshasa and the Kasai River which is navigable by shipping as far as Ilebo,
- railways from the Shaba Region to Ilebo and from Kinshasa to the port area (this is vital for the national route),
- roads from the seaport area to Kinshasa, from Kinshasa to Kikwit, from Lubumbashi to Likasi, from Likasi to Kolwezi, from Lubumbashi to Kasumbalesa (border between Zaïre and Zambia), from Mbuji-mayi to Mwene-ditu,
- as a consequence of containerization at the Port of Matadi there is an inland dry port in Kinshasa called "Terminal container of Kinshasa" which provides
importers and exporters with the advantage of a high quality "door-to-door" transport services (13).

A port's hinterland is as large and available as the road, rail, barge and air interchange facilities allow.

It is worth mentioning that unlike the other transport modes, Zairean Airlines and SCIBE-Zaire flying between Kinshasa and nearly 40 towns provide reliable domestic air services (14).

With the development of containerisation and the ease with which the containers can move from one mode of transport to another, there has been a radical change in the whole basic philosophy of the location of a port (15).

The existence of the transport facilities described above extends the hinterland of the Zairean seaports. Moreover, the large transport rehabilitation programme being implemented now and covering the period 1989-1995 should be of great value to the development of seaports in Zaire (16).
CONCLUSION AND RECOMMENDATIONS

1. CONCLUSION

With its continental dimensions, Zaire has only one maritime route passing exclusively through the country, despite the fact that nearly 80% of the Zairean imports and exports are carried by sea.

This work has demonstrated that the present largest Zairean seaport located at the Zaire River estuary can not cope any longer with the new trend in shipping towards increased size of ships.

Containerization is steadily growing at the port of Matadi through a feeder system.

Regarding the possibility of using ports located in neighbouring countries, it has been mentioned that the ports mostly used by Zaire in its eastern and southern parts are Durban and East-London ports in South Africa. These ports are 3,464 km far away from the southern province of Zaire whereas Matadi, the largest Zairean port, is only 2,746 km far away.

So the use of the national route is less expensive than the southAfrican route.

Taking into account, the probability of the reopening of the Lobito Port to the Zairean traffic and the present use of the Port of Dar-es-Salaam for eastern and southern
Zaire, this study like the previous studies done by external consultants, such as BCEOM strongly recommend the construction of a deep-water port at the Banana site. This port should be designed to be the Zairean load center port. Matadi and Boma should remain as feeder ports. The transport rehabilitation programme which is being implemented will reduce the bottle-neck in the national route and facilitate the movement of cargoes in Zaire. In addition to that, there will always be a need for an optimal use of foreign ports for the traffic from or to eastern and southern Zaire (chapter 1).
The second chapter analyses the constraints to seaport development.
The major constraint is of financial nature and the government is asked to investigate its own financial resources before asking for external assistance. The outlook of the Zairean economy in the medium to long term militates in favour of a moderate scenario (see page 65).
The third chapter demonstrates that the availability of abundant natural and mineral resources and the present level of investments should generate sufficient cargoes; hence seaport development.
2. Recommendations

The government should play an important role in the implementation of the project.

An adequate seaport policy for port efficiency is needed. A real autonomous port administration should be set up allowing the port to operate on the basis of an efficient commercial accounting and costing systems.

Private operators should be encouraged to take part in the venture.

The seaports (Matadi, Boma and Banana) should be managed by a specialised body which will be defined with the assistance of competent port professionals, including external port consultants.

With regard to this aspect, it is worth mentioning that a largely autonomous port unhindered by the procedure of the government in its day-to-day operations, and having delegation of authority within the organization to ensure both authority and accountability of line managers is desirable.

The government should set up an adequate seaport training programme and ensure its implementation.

Finally, for safety in shipping and in port operations the Zairean government should ratify the MARPOL, the consolidated text of the 1974 SOLAS convention, the 1978 SOLAS protocol, the 1981 and 1983 SOLAS amendments and introduce the IMDG code in the maritime code.
FOOT-NOTES

INTRODUCTION
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BRIEF PRESENTATION OF ZAIRE


(3) Pierre Gourou, op.cit., p.1057.


(8) Pierre Gourou, op.cit., p.1057; See also H.T. Grove, op.cit., p.152.

(9) GET, Annaire Statistic des Transports au Zaire, Kinshasa, 1985, p. 27.

(10) Diana Hubbard, op.cit., p. 1067.

(11) Guide to places of the world, a geographical dictionary, Reader's Digest Association Limited.
(14) A.T. Grove, op.cit., p.152.
(15) Diana Hubbard, op.cit., from p.1064 to p.1066.
FOOT-NOTES FOR CHAPTER 2

(1) See presentation booklet of the London Institute of chartered shipbrokers.


(4) RVM, annual report 1982.


(6) Diana Hubbard, op.cit., p. 1066.

(7) GTZ, Transport Planning in developing countries, Nairobi seminar, 12th-25th November 1983.


(9) Captain K.J. Radley, op.cit., p. 142.

(10) Rear Admiral M.I. Arshad HI(M), Improving port performance - Managerial and training aspects in "The problems of the developing maritime world", UAE 1987, p. 152.

(11) Rear Admiral M.I. Arshad HI(M), op.cit., p. 152.


(14) Rear Admiral M.I. Arshad HI(M), op.cit., p. 153.


(18) Rear Admiral M.I. Arshad HI(M), op.cit., p. 154.


FOOT-NOTES FOR CHAPTER 3

(1) B.S. Hoyle, Seaports and Development; the experience of Kenya and Tanzania, Gordon and Breach, 1983, p. 27.

(2) Susan Traill, op.cit., 1989 edition, from page 235 to page 238; See also 1990 edition, from page 212 to 215; Journal de la marine marchande, 9 fevrier 1990, from page 336 to page 338.

(3) Pierre Gourou, op.cit., p. 1057.

(4) Seatrade Week, cruise, cargo, markets. August 31-September 6, 1990, p. 11.


(10) Dominique et Michele Fremy, Tout pour tous, Quid, 1990, Robert Laffont, p. 1527.


(12) Azama Lana, Droit Fiscal Zairois, PUZ, Kinshasa, 1987, p.... (see Zone Franche d'Inga).

(13) Sami Bikoko, 4th African days, Dakar, September

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21-25, 1987, from p. 1 to p. 11.


(15) P.M. Alderton, op. cit., p. 168.

(16) See chapter 1, from page 27 to page 29.
### KEY INDICATORS

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*estimated figure

SOURCE: AFRICA REVIEW, 1990, P. 213
Map of West Africa, showing major cities and geographical features.