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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**A SUB-REGIONAL HUB PORT FOR WEST
AFRICA
(CHOOSING BETWEEN THE PORTS OF ABIDJAN & TEMA)**

By

FLORENCE FREDA USSHER-DENNIS

Republic of Ghana

A dissertation submitted to the World Maritime University in partial fulfilment of the
requirement for the award of the degree of

MASTER OF SCIENCE

in

SHIPPING MANAGEMENT

1999

DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has been previously conferred on me.

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

.....

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DEDICATION

To My Loving husband
Emmanuel Kobina Dennis for his love and support

To my lovely daughters
Amy and Nana Araba for their patience and understanding

In memory of my father
Joseph Rolland Ussher

ACKNOWLEDGEMENT

My first thanks is to the Almighty God for keeping his promises in my life and having brought me thus far.

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I wish to thank all my Professors, especially my supervisor, Prof. Benard Francou, without whose assistance I would have been able to complete this dissertation.

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GOD BLESS YOU ALL.

ABSTRACT

This is the age of mega carriers. Containerships are becoming bigger and bigger and shippers and shipowners wish to exploit this new potential and call to less and less ports to reap the advantages of economies of scale. The ports in the West African sub-region are investing heavily in ports infrastructure in order to attract large ships and transit cargo. However, not all ports can act as hubs. There is not enough cargo and infrastructural development is costly and as the ports are quite near each other, it is not economically viable to provide for efficient operations. The region can benefit from this new trend, if there is co-operation among ports, choose the well suited one for a hub whilst the others will concentrate on feeder development. This dissertation is about determining the options available for the West African sub-region for a hub port by comparing the Ports of Abidjan and Tema as they are the major ports in the sub-region.

The history of the hub and spoke concept is analysed and the criteria adopted by shippers and shipowners in the choice of a hub port is examined. The containerised maritime trade in the sub-region is assessed to see if it would meet the demands of the hub and spoke system. Having determined the criteria, a comparative analysis between the Ports of Abidjan and Tema in the choice of a regional hub, is conducted to see which is more appropriate as a choice of a hub port. From the results, a SWOT analysis is conducted on the Port of Tema. Various strategies adopted by ports to improve upon their competitiveness were examined and the most suitable short and long-term strategies are suggested for Tema port. An appraisal of the projects in the strategies is conducted and the risk and benefits of the projects examined.

The advantages that would be accrued from the development of Tema Hub Port would be beneficial to the country, the region, shipowners and the shippers as Tema is a viable option for a hub port.

KEYWORDS: WEST AFRICA, HARBOURS DEVELOPMENT, HUB PORTS, PORTS OF TEMA AND ABIDJAN

TABLE OF CONTENTS

| | |
|---|-----|
| Declaration | ii |
| Dedication | iii |
| Acknowledgement | iv |
| Abstract | v |
| Table of Contents | vi |
| List of Tables | x |
| List of Figures | xi |
| List of Abbreviations | xii |
| | |
| 1. Introduction | |
| 1.1. Emerging role of Ports in West African Economies | 1 |
| 1.2. Objective and Significance of Study | 4 |
| 1.3. Organisation of Study | 5 |
| | |
| 2. Concept of a Hub Port | |
| 2.1. Origin of Hub Ports | 7 |
| 2.2. Types of Hub Ports | 7 |
| 2.2.1. Local Feeder Hubs | 8 |
| 2.2.2. Regional Feeder Hubs | 8 |
| 2.2.3. Pure Logistics Hubs | 8 |
| 2.3. Advantages of Hub Ports to Shipowners | |
| 2.3.1. Increase in size of vessel | 9 |
| 2.3.2. Access to new/smaller markets | 10 |
| 2.3.3. Global networks | 11 |
| 2.3.4. Other benefits | 11 |
| 2.4. Criteria for choosing a hub port | |
| 2.4.1. Geographical location of the port | 12 |
| 2.4.2. Port Infrastructure | 13 |
| 2.4.3. Port Operations | 13 |
| 2.4.4. Economic Reasons | 14 |
| 2.4.5. Co-operation among Port Authority and Port Users | 14 |

| | | |
|-----------|--|----|
| 2.4.6. | Logistics and Ancillary Services | 15 |
| 2.4.7. | Political and National Regulations | 15 |
| 2.5. | Conclusion | 16 |
| 3. | Containerised Maritime Trade in West Africa & the Concept of Hub Port | |
| 3.1. | Containerisation in West Africa | 17 |
| 3.2. | Direction of Trade | 19 |
| 3.3. | Inter-port Competition & the need for a regional hub port | 21 |
| 4. | Comparative Analysis of Port of Abidjan and Tema ports | |
| 4.1. | Overview of Ports of Abidjan and Tema | |
| 4.1.1. | Historical Development of Port of Abidjan | 25 |
| 4.1.2. | Historical Development of Port of Tema | 26 |
| 4.2. | Restructuring the Ports of Tema and Abidjan | 27 |
| 4.3. | Geographical Location and Links to hinterlands | 29 |
| 4.4. | Organisation of Port Authority | 30 |
| 4.5. | Infrastructure | 32 |
| 4.6. | Port Services | 34 |
| 4.7. | Availability of equipment for port operations | 35 |
| 4.8. | Port Performance | |
| 4.8.1. | Vessel Traffic | 37 |
| 4.8.2. | Port Traffic | 38 |
| 4.8.3. | Container turnaround time | 40 |
| 4.8.4. | Productivity at Vridi Terminal in Abidjan Port | 40 |
| 4.8.5. | Productivity at Tema Port | 40 |
| 4.9. | Port Costs | 41 |
| 4.10. | Custom Procedures | 43 |
| 4.11. | Information Technology | 44 |
| 4.12. | Port Community | 45 |
| 4.13. | Political and Government regulations | 47 |
| 4.1.4. | Conclusion | 47 |

| | | |
|------------|---|-----------|
| 5. | Improving the Competitiveness of Tema Port | |
| 5.1. | Introduction | 50 |
| 5.2. | SWOT Analysis | 50 |
| 5.2.1 | Strengths and Weaknesses | 50 |
| 5.2.1.1. | Strengths | 51 |
| 5.2.1.2. | Weaknesses | 51 |
| 5.2.2 | Opportunities and Threats | 52 |
| 5.3. | Competitive Strategies | 53 |
| 5.3.1. | Short-term strategies | 54 |
| 5.3.2. | Long-term strategies | 56 |
| 5.3.2.1. | Gateway Project | 56 |
| 5.3.2.1. | Terminal Development | 59 |
| 5.3.2.1.1. | Dedicated Container Terminal | 59 |
| 5.3.2.1.2. | Multipurpose terminal | 59 |
| 5.3.2.1.3. | Container Terminal Development | 60 |
| 5.3.2.1.4. | Management of Container Terminal | 66 |
| 5.3.2.2. | Provision of Value Added Services | 66 |
| 5.4. | Risks & Benefits of Increasing Private Participation in Tema Port | |
| 5.4.1. | Benefits | |
| 5.4.1.1. | Improvement in Management | 68 |
| 5.4.1.2. | Reduction in Port Liabilities | 69 |
| 5.4.1.3. | Reduction in business risk | 69 |
| 5.4.1.4. | Promotion of the Port | 69 |
| 5.4.2. | Risks | |
| 5.4.2.1. | Private Monopoly | 69 |
| 5.4.2.2. | Priority of Corporate goals over Public service objectives | 70 |
| 5.5. | Economic Impact Analysis | |
| 5.5.1. | Direct Benefit to Users | 70 |
| 5.5.2. | Direct Benefit to Port | 70 |
| 5.5.3. | Indirect Benefit | 71 |
| 6. | Conclusion and Recommendations | 73 |

| | | |
|---------------------|---|----|
| Bibliography | | 79 |
| Appendices | | |
| Appendix | 1. Trends in Liner Shipping | 84 |
| | 2. GDP growth rates between 1995 & 2010 by main groups | 85 |
| | 3. Port Container Throughput growth between 1995 & 2010 | 85 |
| | 4. Organisational Chart of Tema port | 86 |
| | 5. Organisational Chart of GPHA | 87 |
| | 6. Layout of Abidjan Port | 88 |
| | 7. Layout of Tema Port | 89 |
| | 8. Equipment list – Port of Tema | 90 |
| | 9. Abidjan Port – Trend of Transit traffic (1986-1995) | 90 |
| | 10. Activité de Vridi terminal | 91 |
| | 11. Tema port – Vessel Productivity | 92 |
| | 12. Tema port – Ship Productivity | 92 |
| | 13. Tema port – Average Labour Productivity | 92 |
| | 14. Stevedoring rates in Tema Port | 93 |
| | 15. Estimated Equipment Costs | 93 |
| | 16. Container Terminal Layout | 94 |
| | 17. Multipurpose Terminal Layout | 95 |

LIST OF TABLES

| | | |
|------------|--|----|
| Table 3.1. | Total Container Traffic (TEU) in some West Africa ports | 18 |
| Table 3.2. | Infrastructure in some Principal ports in West Africa | 19 |
| Table 3.3. | Total Tonnage ('000 ton) in some West African ports | 20 |
| Table 3.4. | Main Ports in West Africa | 22 |
| Table 4.1. | Transit times from various trading nations | 29 |
| Table 4.2. | Tema Port berthing | 34 |
| Table 4.3 | Import/Export traffic of Abidjan & Tema ports | 41 |
| Table 4.4. | Members of Abidjan Port Community | 45 |
| Table 4.5 | Summary of Comparative Analysis between Ports of Abidjan and Tema | 47 |
| Table 5.1. | Sustainability of Competitive Advantage | 55 |
| Table 5.2. | Indicative Cost of New Gantry Cranes | 61 |
| Table 5.3. | Civil work cost for Proposed Container Terminal in Tema Port | 64 |
| Table 5.4. | Cost of Equipment in proposed Container Terminal in Tema Port | 65 |
| Table 5.5. | Cost/Benefit Analysis for dedicated container terminal in Tema Port | 68 |

LIST OF FIGURES

| | | |
|-------------|--|----|
| Figure 3.1. | Number of Operators in West Africa (1996-1998) | 21 |
| Figure 3.2. | Comparison of Vessel Traffic in Abidjan & Tema ports (1992-1996) | 37 |
| Figure 3.3. | Comparison of Total Tonnage in Abidjan & Tema ports (1992-1996) | 38 |
| Figure 3.4. | Comparison of Container Traffic in Abidjan & Tema ports (1992-1996) | 39 |

LIST OF ABBREVIATIONS

| | | |
|---------|---|--|
| ASYCUDA | - | Automated Systems for Custom Data |
| BCEOM | - | French Engineering Company |
| CARENA | - | Abidjan Centre de Reparation Navale |
| CEPS | - | Customs, Excise & Preventive Service |
| DWT | - | Dead-weight |
| ECOWAS | - | Economic Community of West African States |
| EDI | - | Electronic Data Interchange |
| FCL | - | Full Container Load |
| GDP | - | Gross Domestic Product |
| GHA | - | Ghana Port Authority |
| GPHA | - | Ghana Ports & Harbours Authority |
| GIPC | - | Ghana Investment Promotion Centre |
| HP | - | Horse Power |
| IMF | - | International Monetary Fund |
| IRR | - | Internal Rate of Return |
| IT | - | Information Technology |
| LCL | - | Less Container Load |
| MTM | - | Marchés Tropicaux et Méditerranéens |
| OTAL | - | O. T. Africa Lines |
| PAA | - | Autonomous Port of Abidjan |
| RMG | - | Rail Mounted Gantry Crane |
| RTG | - | Rubber Tyred Gantry Crane |
| SWOT | - | Strengths, Weaknesses, Opportunities & Threats |
| UNCTAD | - | United Nations Conference on Trade & Development |
| TEU | - | Twenty Foot Equivalent Unit |
| PNDC | - | Provisional National Defence Council |
| SSATP | - | Sub-Saharan African Transport Policy Programme |
| TLC | - | Takoradi Ligtherage Company |
| VAL | - | Value Added Logistics |

CHAPTER ONE

INTRODUCTION

1.1 Emerging role of Ports in West African Economies

Strategic planning and management of shipping and port activities have been greatly influenced by globalisation. The globalisation of the world market and tougher international competition and expansion of geographical markets have forced manufacturers to focus on integrated production and transport service standards. Globalisation has culminated in the development of factors, of which the most important amongst are:

- ❑ The provision of cheap, fast, regular and reliable transport, offering an ever wider geographical coverage,
- ❑ Scale increases in production and distribution processes has made possible technological innovation,
- ❑ Strong concentration of decision making power in the industrial distribution and transport sectors,
- ❑ A general move towards free trade, the lifting of commercial barriers and the deregulation of trade and transport activities and
- ❑ Advances in electronic information technology allowing a world-wide control and reliable link ups of a company to its suppliers and customers. (Monie, 98, 2)

As a result, liner shipping has responded to these new demands by relying on global sourcing and supply of services. Appendix 1 illustrates the new demands of the liner shipping industry. The future development of liner shipping continues to be dominated by international trade: low cost and high customer-specific service quality.

World forecast of GDP growth rates and container throughput (Appendix 2 & 3) between 1995 and 2010 by Ocean Shipping Consultants (1998) shows that volumes of cargo carried will further increase substantially. Thus, liner shipping will still be characterised by:

- ❑ Take-overs/mergers and alliances into new multinational transport companies acting as logistic providers
- ❑ Major carriers will lead to a further increase in the number and increasing the size of vessels deployed
- ❑ The need for major container carriers to upgrade their organisation to offer customer global logistic packages.

The consequences of these are the development of ports and terminals to be able to meet these demands of the liner shipping industry. Port management needs to be flexible, pro-active, autonomous and accountable for its operational and financial performance. Ports will therefore have to re-organise their operations and accept the demands of container services by striving to shorten transit times of containers (by offering the most direct route and maximising direct calls). The aim of this is to reduce the number of ports of call by covering the different sub-regions through a network of feeder services. Thus, the future of most ports in the world would be centred on developing into any one of the following:

- ❑ Local feeder hubs
- ❑ Regional feeder hubs
- ❑ Sub-regional feeder hubs
- ❑ Pure logistic hubs

Ports need to be market places in which international market forces interact with national economies and are able to provide an environment in which the public sector can cope with the provisions. In order for government to be able to meet these challenges, they need to take advantage of opportunities created by international trade/technological advancement, to improve on the level of social and economic development of their countries.

Today, there is convincing evidence that with the economic policy reform in most countries in the West African sub-region, where GDP growth rates are over 5% (SSATP No. 30, 97, 21), they can compete favourably in international maritime transport. GDP improved in Cote d'Ivoire to nearly 7% in 1995 while Ghana, experienced a growth rate of about 6% (SSATP No. 30, 97, 36). The most important step is for countries to move from a no-growth or slow-growth to sustained rapid growth. This will ensure an enabling environment in order to exploit the opportunities at hand. Most governments in the sub-region are therefore adopting policies that will improve their ports to meet international standards, cut down on the cost of maritime transport and be competitive.

Unfortunately, the present ports in the sub-region are not equipped adequately to meet these technological changes in the maritime industry. The ports need to be developed so that they can meet the current technological developments in the maritime industry. This will involve huge investments in the following areas:

- ❑ Expand infrastructure and superstructure
- ❑ Improve productivity
- ❑ Improve communications
- ❑ Offer more attractive financial packages/concessions
- ❑ Lower handling rates
- ❑ Port reforms such as institutional reforms and improved labour practices
- ❑ Improve intermodal or feeder connections
- ❑ Spread risk by investing in other ports and terminals operations

In response to the above demands, all the major ports in the sub-region are also embarking on different types of programmes to improve the infrastructure and efficiency. Notably among them are Ports of Abidjan (Côte d'Ivoire), Tema (Ghana), Dakar (Gambia), Apapa Lagos (Nigeria), Cotonou (Benin), Douala (Cameroon) etc.

The extensive infrastructural development has led to the oversupply of port facilities and inter-port competition in the sub-region which has also lead to port inefficiency, excess harbour space, under utilisation of facilities and the duplication of resources. This has caused high costs in maritime transport. Coupled with this, the percentage

of trade that is generated in the sub-region does not make it economical and profitable for all the ports to develop into hubs. According to the World Bank Report on Lessons and Practices of Project Evaluations (1996), one of the major causes of project failures was inadequate traffic. Most ports rely on foreign financial assistance for any major investment. Thus, the debt burden of the countries has increased because investments have not been able to realise the projected costs and benefits. It is therefore important, for the sub-region to join forces and promote the ports that have the comparative advantage in terms of utilising its facilities as a hub, whilst others concentrate on other port activities. Furthermore, ports need to focus on strategic issues that will save the cost of investment. These issues were reiterated by the Minister of Roads and Transport during the ECOWAS Trade Fair in Ghana in February, 1999 as:

"The countries in the sub-region need to develop consensus on our major ports, which are likely to develop into hub port status whilst the minor ones are made feeder port. This is important in order to save cost in the development of maritime transport in the region" (joyfmnews@gh.com)

1.2. Objective and significance of Study

This study is aimed at analysing the Ports of Tema and Abidjan against this background. These ports handle most of the cargo in the sub-region and the study attempts to identify which one is preferable to shipowners/shippers to use as a hub port in the sub-region. In doing this, the criteria used in the selection of hub ports will be critically examined by highlighting the problems encountered by shipowners in the ports so that port authorities can adopt strategic planning and marketing tools for the realisation of any of their goals. The objective of this is to highlight the need that;

"Handling transshipment containers does not in itself mean twice as much revenue. Supplying good transshipment services is a skill in its own right and providing such services contains distinct costs. Like most activities, it is easy to perform badly, but it takes specialised skills and management to provide

the level of transshipment services demanded today by leading mainline operators.” (Cargo Systems, 1999, 51)

A SWOT analysis of the two ports with more emphasis on the Port of Tema will be examined to determine the strengths, weaknesses, opportunities and threats. This will then be used to determine the strategies needed to make the port more competitive. An appraisal of the strategies that is needed to develop the Port of Tema into a hub will also be analysed and alternative activities that would make the port more competitive will be dealt with.

1.3. Organisation of Study

The study consists of six chapters. Chapter one, which is the introduction, gives a background to the study, statement of problem, and objective and significance of study.

Chapter two attempts to analyse the concept and types of hub ports generally, why the concept has become very popular recently, and the criteria used in selecting a hub port. It will further address the advantages and disadvantages of the hub port concept.

Chapter three will review the development of containerisation in the West African sub-region to determine whether it can sustain the hub concept.

Chapter four will trace the historical development of the Abidjan and Tema ports and a comparative analysis of the two ports to determine which one would be best suited for a hub port adopting the criteria of shippers/shipowners.

From the conclusions in chapter four, chapter five will concentrate on finding competitive strategies that the Port of Tema needs to adopt to improve upon their operations to attract shippers and shipowners. Both short and long-term strategies will be analysed and the best options adopted. Furthermore there will an appraisal of the strategies with suggestions on some alternative options.

Chapter six concludes the study with a summary and recommendations made to the Government of Ghana and the Ports and Harbours Authority about the choices available to improve the competitiveness of the port and how to have a leading edge over other ports in the sub-region.

CHAPTER TWO

CONCEPT OF A HUB PORT

2.1 Origin of Hub Ports

The use of ports as hubs is not a new concept; it has been in practice since nations started engaging in trade. However, the advancement of containerisation has led to an increase in its scope and sophistication in recent times. The introduction of bigger ships, together with the grouping of shipping lines into much bigger operating partnerships has led to liner shipping relying increasingly on a network of strategically located hubs and connecting feeder services. This involves the transfer of containers from one shipping service to another with the objective of enabling through shipment of containers between two ports that are served directly by either one of the services. Direct ports of call by vessels have been reduced as ship owners are always looking for higher levels of productivity from their vessels. As a result, liner shipping has resorted to the use of hub ports to reap some advantages of economies of scale in order to render quality services to their customers. Most hub ports act as load centres and therefore handle far more cargo than their base or destination traffic.

2.2 Types of hub ports

There are three broad classes of hubs:

2.2.1. Local feeder hubs

These connect main lines with local feeder services, e.g. Hamburg for Scandinavia. A peculiar characteristic of such ports is that they have a large locally based cargo of their own and are very close to feeder ports. However, the feeder ports may be unsuitable for direct main call due to either their location or lower cargo volumes.

2.2.2. Regional feeder hubs

These connect main line services with regional feeder services and are normally on a main shipping route, often at the edge of the region in which they serve. Examples of such hubs are the Singapore for the Far East Region and Algeciras for Maersk line's West and Central Africa services.

2.2.3. Pure logistics hubs.

Logistics hubs connect main line services with each other. They are usually strategically located at the intersection of major shipping routes and may handle very little local cargo. They allow different regions to be connected, typically an east-west service with a north to south service. Thus, one main line service will be the feeder for another main line service. Examples of such ports are Colombo connecting Arabian Gulf/Far east services with Far East/Europe services and Algeciras connecting Maersk line services.

It is important to note that a given hub may fulfil more than one of the above functions.

The concept of hub and spoke system has become a new trend in liner shipping not only because shippers/shipowners are always trying to find the best form of service at competitive prices to the satisfaction of the customer but also they gain some economic advantages.

The next section will discuss the benefits that shipowners get from using such a concept in their operation.

2.3. Advantages of hub ports to shipowners

The prime reason for shipowners to use hubs is to provide service between two ports without having to maintain a direct service between those ports. However, the significant increase in the use of the hub concept over recent years may be due to the following reasons:

2.3.1 Increase in size of vessel

Competition among ocean carriers in the liner container shipping sector has put intense pressure on shipowners to reduce costs and make international trade more efficient. In order to adjust to market requirements, big shipowners have brought into service third-generation and fourth-generation container ships (containers with draft of about 14 metres and above) that use economies of scale to bring down the unit cost per container carried. These container ships, however, operate at full efficiency only when they sail fully laden on deep-sea routes. This has led to the idea of concentrating their stops on a limited number of main ports that are efficient and easy to access. The increase in vessel size also means more container moves per voyage and therefore more time spent in port per voyage. A round trip voyage time cannot normally be increased since transit times would become uncompetitive. The better option of time saving is better achieved by reducing the number of ports called directly and serving these ports with feeders instead.

According to UNCTAD (1990), econometric calculation of the optimum size of a container vessel has had a definite influence on the organisation of this new type of shipping service. The optimum size is the result of a compromise between economies of scale on the cost per slot-mile, the cost of keeping the ship berthed in port, the length of voyage and the characteristics of the ports. Thus, the question of economies of scale and trade requirements by the shipper with regard to frequency of service, which is more and more often required once a week have led shipowners to form consortia on a number of trade routes. The formation of these alliances and consortia has made it easier for shipowners to assemble large quantities of cargo required for frequent and competitive sailing and even enable them to increase the number of direct calls. This system of operation has revolutionised the shipping industry leading to less direct calls at ports with very good terminal facilities. Mike Zachary, a principal leading consultant in the transport industry, confirmed this as:

“Shipping consortia will rationalise terminals throughout the world. Maybe there will be one terminal per port or one terminal per region” (Containerisation International 1998).

2.3.2 Access to new/smaller markets

The use of hubs enables shipping lines to serve smaller markets where volumes of cargo do not warrant direct calls effectively. This assertion was reiterated by Tim Stout, Sales Manager for Columbus Line, as a reason for their calls in the Caribbean and Central American countries as:

“Caribbean and Central American countries have numerous markets too small to justify their own direct main line service. However, many of our customers demand a full scope of services and not just to the bigger markets offering the most

complete range of services helps win business
from volume shippers operating on a global basis". (Containerisation Int. 1997)

In addition to the above, hubs enable lines to use feeders to serve markets that may be inaccessible to main line service due to:

- ❑ insufficient time available in the main line's schedule, often due to geographic location of the new port
- ❑ operations in the new port too insufficient or unreliable for expensive main line vessels and
- ❑ new port not suitable for handling large main line vessels.

2.3.3. Global Networks

The use of hubs has made it possible for shipping to be connected on a global basis. With it, global lines are able to enter new markets by consolidating multi-trade volumes for new ports to/from main line services. They also transfer containers between main line services, reduce total port calls and eliminate duplication of port calls between main line services. An example is Far East/Arabian Gulf and Far East Europe hubbed in Singapore eliminating one set of Far East port calls.

2.3.4. Other benefits

- ❑ Hubs help shipowners to reduce equipment-repositioning costs by giving carriers multi-loading opportunities and enhanced asset utilisation.
- ❑ Provide flexibility in feeder vessel schedules for customer satisfaction.
- ❑ Shipowners have often obtained highly favourable tariff terms from competing port authorities that have made efforts both in investment allocations and in the efficient organisation of operation.

There are however some disadvantages and they include the additional operating expenses associated with both the double handling of containers in port and the relay feeder connection. There is also the possibility of cargo being delayed before arriving at its destination; the cost of feeder vessels and there is also a high risk of cargo being damaged and/or stolen.

2.4. Criteria for choosing a hub port

The advent of intermodalism which involves the door to door concept has led to carriers integrating the inland cost of transport to the total cost of freight. This allows port choice to be carrier controlled and is based on principles that will minimise network costs. Thus, the switch from conventional to intermodal pricing has changed ports hinterland and broadened the scope of the distribution network.

The potential of a port to be chosen as hub for the transshipment of cargo will depend on a number of factors.

2.4.1. Geographical location of the Port

The geographical location of a port in relation to main maritime route is of prime importance to the carrier. There should be little or no diversion for main line vessel call. This is because ports with minimum diversion distance are able to achieve high proportions of transshipment thereby reducing cost. Ports such as Singapore and Panama are blessed with good geographical location; they are near main shipping lines. Algeciras also has the advantage of being at a location very close to the route of all vessels transiting the straits of Gibraltar. Port Said and Dametta are similarly well placed close to the Suez Canal. It is also important that the port is centrally located in terms of time rather than distance to the main point of origin or destination of cargo. This calls for a reasonable amount of distance between the hub and feeder ports so as not to increase the cost of operating a feeder service. In the West African sub-region,

the Ports of Abidjan and Tema are more centrally located than the Ports of Nigeria and Gambia.

2.4.2. Port Infrastructure

The magnitude and nature of port facilities in terms of the infrastructure needed is vital for the successful operation of a hub. The number of berths, the depth of water in the approach channels and at berth (a minimum of 12 metres) is important for choosing a port as a hub. There is also the need for a dedicated container terminal with an acceptable draught at berth to handle modern container vessels (3000 – 4000 TEU with a draft up to 12 metres). In addition there should be enough pilots and tugs available to allow vessels to berth at any time. The provision of adequate warehousing facilities for storage of any transit or transshipment facilities is also important. There is also the need for a large terminal space for working and transferring containers within the port.

2.4.3. Port Operations

The efficiency and reliability of port operations is of prime importance to the shipowner. Adequate availability of port equipment, such as quay cranes and shore handling equipment is important. The equipment should be effectively available i.e. maintained in good order, so that port operations are continuous and uninterrupted. This has effect on the productivity and quick ship turnaround time, which is a priority in the liner shipping market. In addition to the above, carriers prefer ports that will allow them to own terminals and stevedoring operations. This enables the shipowner to control and gear his own operations to generate maximum efficiency. Furthermore, there is also the need for sufficient quality manpower to ensure efficient operations. There should also be a multishift system of work for port operations so that the port runs around the clock. Labour relations should be stable to allow efficient and flexible working practices.

2.4.4. Economic Reasons

The carrier adopts different economic indices in selecting a hub. The most important of all is that total cost should be low and competitive in relation to others in the sub-region. The cost for handling transshipment cargo should be lower than handling local cargo. For example in Singapore, stevedoring charges on transshipment are less than two-thirds of the equivalent charges on domestic cargo (UNCTAD 1990). The total cost of a call should be directly related to the time the vessel spends in port, and this is directly related to the container handling speed. In effect the total voyage time should be minimised. In addition to this, there should be enough cargo for the captive market and there should be a mix of cargo in terms of ports and volumes for a balance in trade. Carriers do not only use ports to tranship or interline but also there should be a significant local market, which makes the call worthwhile.

There is also the need for ports to carry out marketing strategies to attract feeder services. The success of a hub requires a high degree of services by the main shipping lines, and a high degree of feeder services development to ensure a high frequency of sailing to feeder port. A suitable road and rail connection in the port for the development of the multimodal transport distribution is also important.

2.4.5. Co-operation among Port Authority and Port users

Another important criteria for determining a hub port is the need for co-operation and co-ordination between customs administration port authorities, terminal operators and port users (shippers and carriers). This is intended to make the transshipment of cargo through a port, either directly or with cargo storage for shorter or longer periods, as short as possible. Aligned with these are simple customs documentation procedures to ensure faster delivery and transshipment of cargo to reduce time and cost. Forms of organisations such as the development of Free Port or Free Trade zones should be

devised. Port users can even be encouraged to develop areas within port as centres for regional warehousing, where cargo can be stored until it is required and shipped out. There is also the need for the port authority to be dynamic and efficient as well as responsive to the demand of shipowners and port users in general. All these will have a long effect on enhancing the reputation of the port.

2.4.6. Logistics and Ancillary Services

The need for better logistics and ancillary services cannot be overlooked in the efficient running of a hub port. This will not only be in the form of facilities or services which may be available in or near to the port, but the availability of efficient and helpful shipping agents, competitive insurance, efficient telecommunication systems, efficient financial and maintenance services such as dry-dock facilities. There is also the need for safety measures to ensure that both the ship and cargoes are safe. With the advancement in technology, there is also the need for the port community to be served with an electronic data interchange to enhance communication within the port and the outside world.

2.4.7. Political and National Regulations

The shipowner must have long-term confidence in the political stability of the country in order to select a port as a hub. This is because an interruption of activities in a hub will have serious repercussions on a whole trade route. Political stability is also needed for stability in decision making. Favorable commercial regulations with minimum restrictions encourage trade. Thus, a law such as cabotage, which allows ports to give preferential treatment to local shipowners, would not allow fair competition. This is one of the reasons why the European Union has banned the cabotage law. In addition to the above, there is also the need for countries to incorporate regulations of the International Maritime Organization into national regulations to ensure that maritime transport would be regulated according to international standards.

2.5. Conclusion

The concept of hub ports has developed out of the technological advancement and shippers' demands in liner shipping. In order to reap the benefit of economies of scale, shipowners assess the capability of a port to handle the needed cargo and vessels. The next chapter will analyze the development of containerized maritime transport in West Africa in order to assess whether the region is ready for the development of the hub and spoke system.

CHAPTER THREE

CONTAINERIZED MARITIME TRADE IN WEST AFRICA AND THE CONCEPT OF HUB PORT

3.1 Containerization in West Africa

Although containerized maritime trade in West Africa is still in its infancy its growth shows that it plays a significant role in the economies of the West African states. Between 1990-1995 the degree of containerization increased from 20% of the general cargo trade to 34%. Although most of the exports are agricultural commodities, there is some degree of containerization in the export of some of commodities such as cocoa, coffee and timber. The total tonnage of the container traffic has showed an appreciable increase since 1992 (56%). Table 3.1 shows the container traffic in some selected ports, and indicates that most ports have had increases in total container traffic over the years.

However, containerization in West Africa has not seen the same growth rate as in other regions due to the following limitations:

- ❑ Regulatory and administrative environment has limited the utilization of the full concept of logistics,
- ❑ Port limitations in terms of draft restrictions. The sizes of vessels that dominate the West Africa trade are therefore within the sizes of 800 – 2500 TEU with drafts within the range of 9 meters. Modern container vessels are of sizes between 3000 to over

6000 TEU with drafts up to 14 meters. Thus ports will need berths of 12m to attract modern container vessels, between the sizes of 2,500-4000 TEU.

- ❑ Intermodalism and inland distribution of containerized cargo is inefficient and costly. A very small percentage of cargo leaves the port intact. It is estimated that about 80% of containerized cargo are stripped or unstuffed at the port.

Table 3.1 - Total Container Traffic (TEU) in some West African Ports

| Port | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---------|--------|--------|--------|--------|--------|--------|--------|
| Cotonou | 25617 | 28225 | 36386 | 43113 | 48196 | 54487 | 54293 |
| Douala | 76554 | 82360 | 75506 | 75480 | 96241 | 104757 | 116838 |
| Abidjan | 179501 | 188728 | 238822 | 247544 | 261325 | 309713 | 416111 |
| Lagos | Na | 133242 | Na | Na | na | 114770 | 152129 |
| Dakar | 74138 | 78230 | Na | 73954 | 87000 | 99968 | 110936 |
| Tema | Na | 85129 | 93223 | 88534 | 102809 | 125642 | 140260 |

Source – Containerization International 1996 – 1998

- ❑ Many vessels that call in the region are smaller and less efficient than they could be due to the large number of operators and limited availability of northbound containerized cargo. The three to four large liner operators in the region employ fully cellular vessels in the approximate range of 1100 – 1700 TEU, while other operators generally use far smaller vessels averaging less than 800 TEU (Palsson, 1998, 6).

A recent Drewry Shipping Consultant survey document estimated that, a vessel's competitiveness could be enhanced when large vessels are employed on a trade route. This is because the unit cost of operating a new 6000 TEU vessel when fully utilized amounts to 20% advantage over a 4000 TEU vessel. (Palsson, 1998, 7).

Table 3.2 shows the infrastructure available at the principal ports in West Africa. From the table one can deduce that most of these ports do not have the necessary infrastructure and the superstructure to serve modern container vessels.

Table 3.2. - Infrastructure in some Principal Ports in West Africa

| Port | Port with container terminals | Draught (m) | Berth (No.) | Berths with Container Cranes |
|---------|-------------------------------|-------------|-------------|------------------------------|
| Dakar | Yes | 10.5 | 52 | 1 |
| Abidjan | Yes | 12.5 | 25 | 2 |
| Lagos | Yes | 10.5 | 27 | 2 |
| Douala | Yes | 8.5 | 17 | - |
| Cotonou | Yes | 12.5 | 9 | 1 |
| Tema | Nil | 9.5 | 14 | 2 |

Source: Containerisation International 1998

However, with the present trend of containerization, transshipment within the sub-region is expected to increase from 25% to 50% of the container volumes by 2010 (World Bank).

3.1. Direction of Trade

An analysis of the World Bank on general cargo generated in the coastal countries of Senegal, Cote d'Ivoire, Nigeria, Ghana and Cameroon accounts for about 75% of the total tonnage to and from West Africa.

Table 3.3 shows the total tonnage of trade in some of the major ports on the coast. Cargo traffic in all the ports has been increasing at a fast rate over the last 6 years. This is because most of these countries, although beset with political problems, have had an average increase of about 5% increase in gross national product over these years. Unfortunately, as most of these countries exports are purely agricultural products with little added value, and their imports are largely manufactured goods, the imports always seem to exceed exports.

Although many shipping lines dominate trade in the West African sub-region, Delmas and the CMB/T SAFMARINE combination are the strongest. They controlled about 26% of the trade in 1995. Other major carriers are Maersk, Nedloyds, Mitsui/OSK (MOL) and Table 3.3 – Total Tonnage in ‘000 tons

| Port | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---------|-------|-------|-------|-------|-------|-------|------|
| Cotonou | 1486 | 1735 | 1917 | 1984 | 2077 | 2220 | 2248 |
| Douala | 3598 | 3594 | 3729 | 3934 | 4305 | 4297 | 5113 |
| Abidjan | 10498 | 10569 | 10639 | 10418 | 11967 | 13750 | na |
| Dakar | 5355 | 5310 | 5046 | 5007 | 5667 | 6028 | 6168 |
| Tema | Na | 3909 | 4130 | 4090 | 4611 | 4880 | 5188 |

Source – Containerization International 1996 - 1998

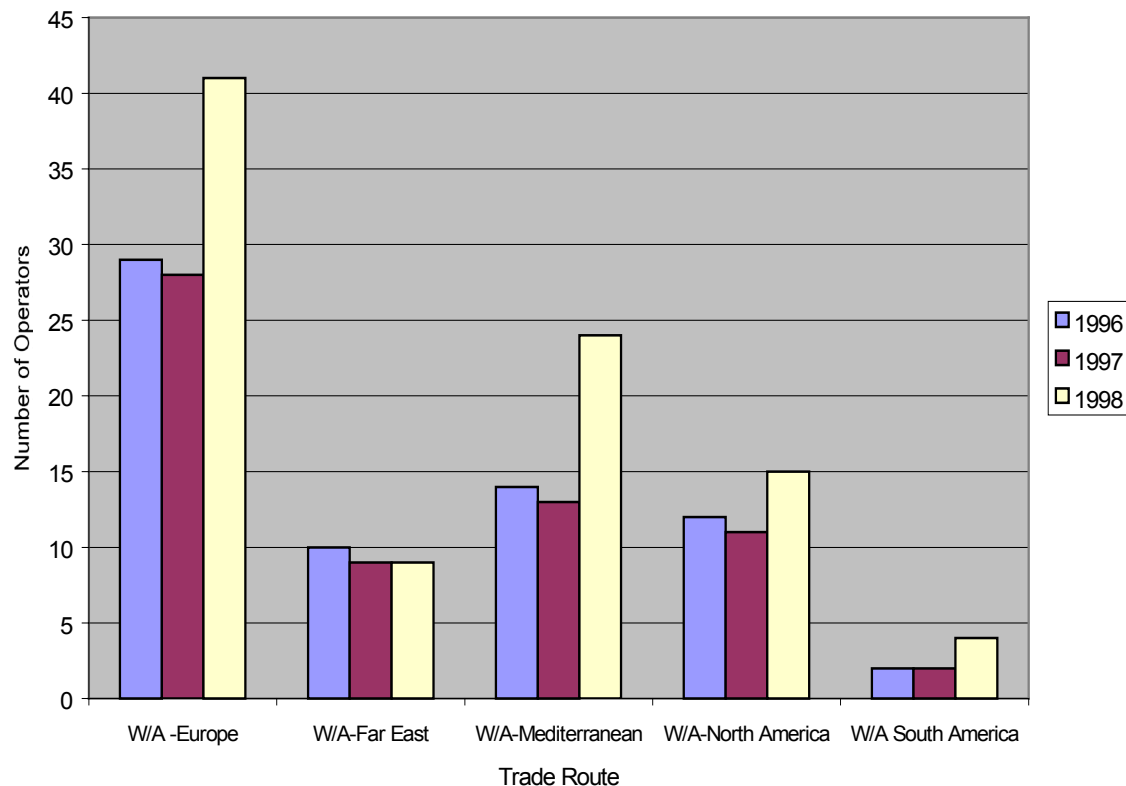
na – not available

Nippon Yokan Kokan (NYK). There are other vessels operated by shipowners based in the sub-region, however, these lines primarily operate small combination ships (conventional with some container capability) which cannot compete effectively with modern container vessels. About 66% of the general cargo imports originate from Europe, which has 68% of the regions' general cargo in exports. Figure 1.1 depicts the trend of increase in the number of operators from 1996 to 1998. Between these two years, the number of ship operators increased by 41% from Europe, 71% from the Mediterranean, and 25% from North America. The 71% increase from the Mediterranean is due to the transshipment of cargo of Maersk in Algeciras.

The increase also indicates the trend of liberalization in the economies of most of the countries, which has led to an increase in trade in the sub-region. Furthermore, international trade is no longer viewed as a threat to national economies. Various governments have therefore resorted to various methods in the removal of trade

restrictions, such as protectionism, cabotage laws and the improvement of port facilities to enhance international trade and develop economies.

Figure 3.1.-Number of Operators in West Africa (1996-1998)



Source - Containerisation International 1998-1999

3.3. Inter-port Competition and the need for a Regional Hub Port.

The current system of containerized trade is the multiple call system. The services offered consist of calling on all the numerous ports on the coast. It is only Maersk line, which uses Algeciras in Spain as the single port from where West Africa ports are served. A list of the main ports in the various countries of the sub-region is shown in table 3.4.

Table 3.4 – Main ports in West Africa

| Country | Port |
|----------------|------------|
| Mauritania | Nouakchott |
| Senegal | Dakar |
| Gambia | Banjul |
| Guinea Bissau | Bissau |
| Guinea Conakry | Conakry |
| Sierra Leone | Freetown |
| Liberia | Monrovia |
| Côte-d'Ivoire | Abidjan |
| Togo | Lome |
| Benin | Cotonou |
| Nigeria | Lagos |
| Cameroon | Douala |
| Ghana | Tema |

In the past years, the ports in the sub-region have resorted to fierce competition among themselves to attract transshipment and transit cargo. This is because most states have lost their shipping lines due to the collapse of the conference system. Thus, the only option left is to compete among their ports to get some share of the maritime trade in the sub-region. There has therefore, been a series of competitions in terms of port development. By 1989, five seaports, namely Dakar (Senegal), Abidjan (Cote d'Ivoire), Tema (Ghana), Lagos (Nigeria) and Douala (Cameroon) had invested heavily in the development of transshipment facilities in the dry-bulk market. By 1995 most of these had become outmoded with the introduction of third generation vessels which required dedicated container terminals and sophisticated equipment. Again, this led to another port development competition in the sub-region. What emerged from all these were port

efficiency, excess harbor space, underutilisation of the facilities, and the duplication of resources leading to high cost for the shipper.

It would be important therefore, for the sub-region to harmonize and co-ordinate shipping policies so as to develop a regional hub that will be able to reduce shipping costs and enhance trade for the benefit of all the countries in the sub-region. The development of a hub port with competitive feeder services will give local African shipowners the opportunity to compete favorably and improve upon their services. In addition to the above a well-developed hub port can even attract transshipment cargo to Central Africa. Studies conducted by the World Bank/UNCTAD (SSATP, 97, 67) have revealed that most West African ports charge rates that are 'reasonable' in comparison with ports elsewhere. The world average gross cost of port is also estimated to be between \$250 - \$300 per TEU and West African ports generally have costs at slightly below this world average. As a result, West African ports can offer hub status if there is more liberalization of the economies.

The development of a pure logistics hub in West Africa is unlikely, both due to the lack of appropriate main line routes passing close to the region and the operational restrictions in the regions ports. The possible development of a hub would, therefore, be in the expansion of a regional feeder system.

The question then is: 'Which port would be considered as a regional hub port?' Generally shipowners and shippers would choose a port that will be able to reduce their total cost of transport. Aspects that make this possible include, time spent in port, vessel turnaround time, vessel productivity and faster documentation procedures. In West Africa however, apart from the factor of total cost, the political stability of the country will play a very important role in the decision of the shipowner and the shipper. The political instability that has beset the sub-region has rendered some important ports, such as Dakar and Lagos, unlikely to be chosen by the shipowners as hubs. According to the World Bank (SSATP, 1997, 67), conditions in Nigeria presently, eliminate her from consideration as a hub. This is because she does not only have the

geographical disadvantage but also serious restrictions on its shipping policies. The geographical position of Dakar being very far from most ports in the sub-region also makes her an unsuitable choice. Some of the important ports left in the author's view, are Abidjan, Tema and Cotonou, which is presently being developed by Maersk line.

The next chapter will critically examine the Ports of Abidjan and Tema in order to determine which one has the competitive edge, in shipowners view, to be chosen as a hub in the sub- region. These two ports have been chosen for comparison due to the following factors:

- ❑ They are geographically located in the center of the sub-region
- ❑ They handle a large volume of the containerized cargo in the sub-region
- ❑ They have a long political stability and
- ❑ They are implementing changes in port operations, which makes their systems more cost effective in comparison to other ports in the sub-region.

CHAPTER FOUR

COMPARATIVE ANALYSIS OF ABIDJAN AND TEMA PORTS

4.1. Overview of Ports of Abidjan and Tema

4.1.1. Historical Development of Port of Abidjan

The history of the Port of Abidjan dates back to 1897 when the Dutch, French and Portuguese sailors came to trade with natives of Grand Bassam and Assinie and later in Sassandra and San Pedro in the south-west of Côte d'Ivoire. The growth in trade brought with it difficulty in handling cargo due to inadequate equipment. There were long waiting hours and working times at wharves and roadsters, which had been built at Grand Bassam in 1897, Port Bouet in 1923 and Sassandra in 1952 and 1971. Abidjan was therefore selected for a port in 1898 to serve both the country and its hinterland. In 1950, the Vridi Canal was built to link the sea to Ebrie lagoon. Since that time the port was opened to maritime traffic and has been the backbone of the economic growth of the country.

Abidjan port has experienced three main expansion programmes. The first (1951-1967) dealt with the construction of 2,300m in the quays, divided into 15 berths, as well as 9,400m of quays for the fishing port. There was also the development of 270m of quays for banana export, and specialised sections for timber and petroleum were opened in the Banco Bay. In addition, a section for mooring tankers has also been developed linking the refinery by a sea line 5,300m long. The second plan, 1963-1980 extended the port southwards by the construction of 1260m of new quays. Finally, the Vridi Canals was deepened to give access to bigger carriers. The third plan was developed in the 1980's. It dealt mainly with the extension of the port to the site of Locodjoo and the Boulay Islands. Unfortunately, none of the projects

agreed in the third plan were implemented. This was generally due to a slump in the economy and lack of activity at the port. Between 1985 and 1994, the annual growth of activity at the port was less than 1% (MTM, 1998,72). In 1996, the extension plan was reactivated with a feasibility study by a Dutch consultant.

With the advancement in technology in the maritime industry, the port infrastructure and facilities have been modified to cope with the increase in traffic. As at now Abidjan Port is seen as the “lung of the Ivorian Economy” handling between 85% to 95% of the Ivorian external trade (Zacharie, 1997, 15).

4.1.2 Historical Development of the Port of Tema

The construction of the Tema Port coincided with proposals to develop a hydroelectric power on the Volta River. This was preceded by a proposal to investigate the establishment of an aluminium producing industry powered by a hydroelectric station on the Volta River in 1949. In 1951, the then government of Dr. Nkrumah (first President of the Republic of Ghana) accepted the recommendation of Halcrow report for a need for a port in Tema. Preliminary works started in 1952 and were completed in 1954. Works on the construction of the Port started in 1954 and the first vessels entered the port with cargo in 1958. The port was opened to regular traffic in January 1962.

The Port underwent a major rehabilitation in 1985 by Messrs Sir, William Halcrow and Partners. The cost of the project was US\$106.6 million. This comprised of the following:

- ❑ Port rehabilitation and modernisation works
- ❑ Tema inner fishing harbour project
- ❑ Institutional strengthening
- ❑ Redeployment/redundancy to rid the authority of overstaffing

After the rehabilitation and institutional changes the needed equipment were provided to improve the productivity of the port. Since then, the increase in traffic has far outstripped the present facilities. The government also aims to develop the

port as a gateway to the West Africa sub-region (hub). Thus, the government has designed another major rehabilitation and work began in 1999. This is expected to change the port into one of the most modern and well-equipped port in the sub-region.

4.2 Restructuring the Ports of Tema and Abidjan

The Government of Ghana has embarked on an ambitious social and economic development programme known as “Vision 2020” which will incorporate the economy into the globalisation of the world economy. Central to this is a commitment of transforming Ghana into a middle-income country and make it a gateway to the sub-region. Thus, the government has set up a Trade and Investment Gateway Project with the objectives of implementing measures designed to attract a critical mass of export-oriented firms and facilitate trade so as to accelerate growth. This will be done through:

- ❑ The development of off-site infrastructure for a privately financed export processing zone and
- ❑ The improvement of the quality standard services delivered to investors and to exporters by government institutions and agencies responsible for trade and investment.

A sub-project has been created for Ghana Ports and Harbours Authority (GPHA), which comprises of the following:

- ❑ Construction of container devolving area outside the Port of Tema and acquisition of equipment thereof
- ❑ Carrying out a review of GPHA’s operational procedures with a view to shortening turnaround time for ships and clearance time for goods.
- ❑ Implementation of improved procedures to increase private participation in developing port facilities in Ghana into a regional hub for passenger, cargo and express delivery services
- ❑ Transformation of GPHA into a “Landlord Port Authority” which will own port assets but contract out operations to the private sector.
- ❑ Development of electronic data interchange at the Port of Tema and

- ❑ Carrying out a feasibility study for the dredging of quay 2 at Tema port

However, Ghana is not the only country in the sub-region pursuing such an extensive port policy. The Government in Abidjan in 1991 implemented a structural adjustment programme, “The Plan Quatara” through the IMF/World Bank programme of fiscal austerity and market liberalisation, to promote investment growth. It had an ambitious target of 5% in GDP growth by 1995 and an annual growth of 3.2%. A further 50% devaluation (Europa, 1999, 396) of their currency, which boosted their exports in January 1994, led to more improvements of facilities in the port. These included the installation of large-scale container-handling facilities and there are plans to double the capacity by 1999 (Europa, 1999, 396).

According to the estimation of the Port Authority, the present needs of the port are:

- ❑ To construct new dock warehouses and earth platforms
- ❑ Create dedicated terminal for minerals, with specialised berths for zinc, coal, aluminium, scrap iron etc.
- ❑ Create a large customs car park for second-hand cars
- ❑ Create a new area for storage for use by customs, container and cargo storage areas
- ❑ Build a new container terminal for efficient handling of containers
- ❑ Build dedicated areas for fuel stations and for garages for cargo handling companies.

There are also plans to provide extensive infrastructure works (roads, bridges, water, electricity) to the port area. The mineral terminal is particularly needed to enable the transit of manganese from the Tambao deposits in Burkina Faso. It is expected that the above plans will commence at the end of 1999.

It can be inferred from the above that, both Abidjan and Tema ports need major investment to be able to modernise the port to meet the criteria set by shipowners/shippers for the hub and spoke in the sub-region. The following section will assess the criteria adopted in choosing a hub port to analyse the capability of each being a hub port.

4.3 Geographical location and Links to Hinterlands

The West Africa sub-region does not lie on any main north-south or east-west trade route. It however lies on the main routes to countries in Central and Southern African countries.

The Port of Abidjan is nearer to the trade routes of most of the trading partners than Tema port. Table 4.1 shows that the transit times between West Africa to most of the trade destinations are shorter for Abidjan port than for Tema port. This gives it an important geographical strength for it being chosen as a hub.

Table 4.1 - Transit times from various Countries (Number of Days)

| FROM/TO | ABIDJAN | TEMA |
|-----------|---------|------|
| Rotterdam | 11 | 17 |
| Hong Kong | 26 | 32 |
| Dubai | 21 | 27 |
| New York | 18 | 24 |

Source – Maersk Line

Abidjan port is also linked with well-paved roads and an airport. It has a railway line linking it to Burkina Faso with 660 kilometres of the railway line in Côte d'Ivoire. A single authority, the Regie du Chemin de fer Abidjan-Niger (RAN) managed the railway line (in both countries) but experienced financial and technical difficulties when both freight and passenger traffic declined. It was liquidated in 1989 and management responsibility has since been transferred to SITRARAIL, a consortium of French, Belgian, Ivorian and Burkinabe investors. This contract has boosted the use of the rail for transit of cargo to the landlocked countries tremendously.

In comparison, Tema is also linked with very good roads connecting the port to the hinterland. Unfortunately, its main railway connection from Tema to Takoradi and Kumasi has deteriorated over the years. The government is however, refurbishing

the main roads to improve the use of the port by the landlocked countries. It has almost completed a major road linking Ghana to Burkina Fasso through Tamale and Bolgatanga in the Northern Ghana. It has also completed a 78-kilometre road to Akosombo, to link the Tema port to the Akosombo port for ease of transit cargo on the Volta Lake (joyfmnews@gh.com, June 1999)

4.4 Organisation of Port Authority

The organisation of any port authority influences the organisation of efficient port operations. The Ghana Ports and Harbours Authority is the statutory body governing the Ports in Ghana. It was established as a statutory corporation in June 1986 under PNDC law 160. It was formed out of the then Ghana Cargo Handling Company (GCHC), Takoradi Litherage Company (TLC) and Ghana Port Authority (GHA). The law establishing the Authority sought to create one corporate body to be responsible for the operation, management and administration of the port. PNDC law 160 gives power to the Authority to plan develop, manage, maintain, operate and control ports in Ghana and in particular to:

- ❑ Provide in a port such facilities as appear to it to be necessary for the efficient and proper operations of the port,
- ❑ Maintain the facilities and extend and enlarge such facilities, as it shall deem fit.
- ❑ Regulate the use of any part of the port facilities,
- ❑ Maintain and deepen as necessary the approaches to the navigable waters within and outside the limits of any port and also maintain lighthouses and beams and other navigational services and aids as appear to it to be necessary,
- ❑ Carry on all of the business of stevedoring, master portorage and litherage services and
- ❑ Provide and maintain pilotage service and generally discharge any other functions with are necessary or incidental to the provision of adequate port services.

Thus, the Port Authority is purely a monopoly administering both the infrastructure and superstructure. As has been stated earlier, the port is now moving into a

landlord port status where the Port Authority will provide the infrastructure and private operators will be handling both stevedoring and shore operations.

The administration of the Port is by a nine-member board, which includes the Director General and the Directors of the two ports of Tema and Takoradi. Appendices 4. & 5 show the organisational structure of Ghana Ports and Harbours Authority and Tema Port Administration. The Board is responsible to the Ministry of Transport and Communication for the formulation of policy relating to the Authority. The day to day administration of the port is vested in the Director General who is the Chief Executive, the two Directors and other Principal Officers. The two ports are semi-autonomous with Port Directors responsible to the Director General.

In contrast, the Port of Abidjan is a landlord port where the authority is in charge of the following services:

- ❑ Conservancy services
- ❑ Pilotage and towage
- ❑ Civil engineering

Cargo handling activities are in the hands of private operators. At the moment, there are about 30 licensed cargo-handling operators in the port. Out of this number, there are 6 big operators who control close to 80% of the market with the remaining 24 controlling 20%. The private operators control port labour and have formed a syndicate, called SEMPA, which represent the interest of all operators negotiating on their behalf. The authority leases port space and facilities to SEMPA, which in turn allocate to their members with full payment of fees commensurate with the level of operation. Six big non-profit making joint venture operate the Vridi Container Terminal with members having equal shares. The terminal, hire container handling equipment from the operators who pay the operators on a monthly basis according to the number of equipment used. An 8 member Board that is nominated by cabinet governs the PAA. The day to day management is by a General and Deputy General manager also nominated by cabinet. The administration of the port is divided into six divisions; Exploitation, Technical Studies and Works, Logistics and Container

Terminal Management, Shipping Operations and Security, Finance and Accounts, and Administration and Human Resources.

In comparing the organisation of the two ports, there is a proliferation of too many port operators in the Port of Abidjan. In the author's opinion, the numbers of operators are too many in comparison with vessel and cargo traffic. This phenomenon is a major problem in the privatisation of port operations especially where the port does not have a large traffic. An oversupply of the operators has problems, such as underutilisation of equipment, underemployment and high port charges. Another interesting feature with the port operators in the Abidjan port is that majority of these operators, through recent alliances and mergers on the international scene has created some form of private monopoly that is worse than a government monopoly. Although, shipowners seem to be happy with this arrangement, it only favours companies that own private stevedoring companies. Thus, it does not offer fair competition to shipowners who do not have stevedore subsidiaries. On the other hand, Tema port has its operations fully controlled by the government and this also needs to be streamlined in order to promote efficiency and effective competition. Ghana should learn from the lesson of Abidjan port when giving out port operations to private operators to prevent creating another private monopoly with its adverse effects.

4.5 Infrastructure

It has been stated already that, both ports have undertaken rehabilitation to upgrade facilities so as to meet present technological advancement. This is considered very important since a hub port should have the needed infrastructure to accommodate modern vessels for quick turnaround time in order to reap the advantages of the hub and spoke system.

Presently, the Port of Abidjan covers 1000 hectares of completely marked out water area and 800 hectares of land area. It can take vessels 260m long with the maximum depth of 12.5 metres. All the quays are linked by roads and railways and can accommodate 60 ships for simultaneous commercial operations. The layout of

the port is indicated in appendix 6. The harbour has several specialised quays: fertiliser, lighters, barges, vegetable oil and wine. It has also specific terminals for containers, fruits and vegetable, timber and hydrocarbons.

Tema port on the other hand, has 12 berths with a length of 183m and the deepest drafts being 9.6 metres. Table 4.2 indicates the number of berths and the corresponding length and depths. (Layout indicated in appendix 7)

Unlike Abidjan that has a lot of specialised berths handling different types of cargo, Tema port has only two specialised berths i.e. Valco and Oil berths which also handles bulk cargoes such as alumina, pitch coke and aluminium. The Valco berth has a length of 175 m with 9.6 draft and Oil 244 with 9.8 deep.

Furthermore, Abidjan port has a dedicated container terminal, which is one of the most efficient in Africa (MTM. 1998,72). It has almost 1000 m of quays; and 25 hectares of entirely paved open spaces. It has five berths that are divided into two berths grounded at a depth of 11.5 m, two other at 12.5 and a berth with a Ro-Ro platform that is grounded at 12.5m.

The commercial infrastructure of the Abidjan port includes 143,507 metres of sheds and warehouses, a parking lot of 4.6 hectares for vehicles transporting food and a parking lot of 1.6 hectares for the transit of imported second-hand vehicles

Unfortunately, Tema port is not equipped with that many facilities. Container and Ro-Ro vessels are handled at berth numbers 1 and 2, which are general cargo berths. Thus, there is usually the problem of queuing and a struggle over which vessels will be given the priority if two vessels report arrival at the same time. The length of the quay is also very limited and some modern vessels occupy about one and half berth space. Thus, the port is severely limited in terms of both draft and the availability of enough berths to accommodate increases in vessel size if the port is to be chosen as a hub.

Table 4.2 – Tema Port Berthing

| Number of Berths | Length (m) | Depth at LW |
|------------------|----------------|-------------|
| 1 | 183 | 9.6 |
| 2 | 183 | 8.6 |
| 3 | 183 | 7.6 |
| 4 | 183 | 7.8 |
| 5 | 183 | 7.7 |
| 6 | 183 | 7.4 |
| 7 | 183 | 7.9 |
| 8 | 183 | 7.6 |
| 9 | 183 | 7.6 |
| 10 | 183 | 7.6 |
| 11 | 183 | 7.6 |
| 12 | 183 | 7.6 |
| Valco | 175 (max. LOA) | 9.6 |
| Oil | 244 | 9.8 |

Source - Ghana Port and Harbour Authority

4.6 Port Services

The Port of Tema is well equipped with four tugboats with capacity ranging from 1320 hp to 2220 hp. A minimum of two of these is usually used for berthing and unberthing. There are 2 dry-docks at the Port of Tema which are privately operated by a Malaysian Company; PSC Tema Shipyard Ltd. Dry-dock number one is the biggest and is serviced by two travelling cranes of 20-ton and 60-ton capacity. The dock has a capacity for vessels of up to 100,000 tonnes DWT with a length of 277 metres. The entrance width is 45.4 metres with an inside width of 47.2 metres. The Port has also a fishing harbour with a draft of 5.8 metres with the following facilities:

- ❑ A main wharf capable of accommodating 30 steel vessels
- ❑ A preparation wharf of four berths
- ❑ Fish unloading wharves

- ❑ A lay-up wharf 100 metres long for net repairs
- ❑ A lay-by jetty 155 metres long capable of accommodating 53 wooden vessels
- ❑ Mooring facilities for 20 steel vessels
- ❑ Fish handling shed for discharging fish etc.

Comparatively, Abidjan port also owns two stationery dredgers of 1500 and 3300 HP and provides 143,507m² (Zacharie, 97,17) of sheds and warehouses to private companies which carry out storage and transit of goods. It also has a fishing harbour far bigger than the size of Tema. It comprises of 1050m² of 5m to 11.5m in depth. It is equipped with cold stores with a capacity of 51000 tonnes and many fishing processing and canning industries has been set up alongside the quay.

Furthermore, the port has a dry-dock, CARENA, well equipped and competitive as compared to those in other African counties. It has two floating docks of 2000 and 10,000 tonnes and two shipways of 80 tonnes and 300 tonnes.

4.7 Availability of Equipment for Port Operations

It is important for any port to have enough equipment, which are well maintained for efficient port operations. This is an important criterion that will be counted in the choice of a hub because, without it, port performance will be low and there will be very high dwell time for containers in port, affecting port and labour productivity.

Abidjan port has since July 1986 been equipped with two heavy full gantry cranes each capable of lifting 40 tons. A third full gantry crane has been bought by the port and will be in service in 1999 and a further two cranes are expected to be delivered in 2000 (MTM, 1998, 74). In comparison, the Port of Tema has 2 by 40 portal cranes that are not effectively maintained. They are very old and outdated and the port usually has problems in acquiring the necessary parts to keep them working. They usually breakdown and are barely used in operations. This of course, has been causing a lot of concern to the shipowners because in case of any ship cranes breaking down, then there is a problem of how to work the vessels. This causes delays to ships and would not be tolerated when cargoes have to be transhipped.

Cargo handling in the Port of Abidjan is handled by private companies, whilst in Tema it is handled by a less monopolistic situation by the port authority and two private stevedoring companies – Atlantic Port Services and Speedline Limited. In Abidjan, the private companies have their own equipment; e.g. 25 and 40 tonne straddlecarriers and challengers to handle full containers. They also own forklift trucks for empty containers and wrecking cranes to handle heavy lifts. Unlike Abidjan, the private stevedoring companies in Tema port do not have the needed equipment and depend on the Port Authority for the supply of equipment for their operations. Their argument has been that they handle only 15% and 10% of the stevedoring. It is therefore too expensive for them to purchase expensive equipment for that menial job. However, with a recent move towards the privatisation of port operations, the stevedore companies have acquired some new equipment to bid for private participation.

The problem of effective availability of equipment in the Port of Tema is a matter of serious concern. The situation becomes so serious that, during the peak periods, shipping agents are always forced to supplement the handling of their vessels with their own equipment. There were cases in 1997 when the Port Authority had to rent equipment from shipping agents to be able to run efficiently. These problems arise because the port's inventory system limits effective maintenance. The list provided in Appendix 8. indicates the position of port equipment as at October 1998. An on ground examination shows that most of these equipment are not in good condition. The Port of Abidjan does not have such a magnitude of problems. At least, such problems are not heard because the stevedoring is done by the same shipping agents.

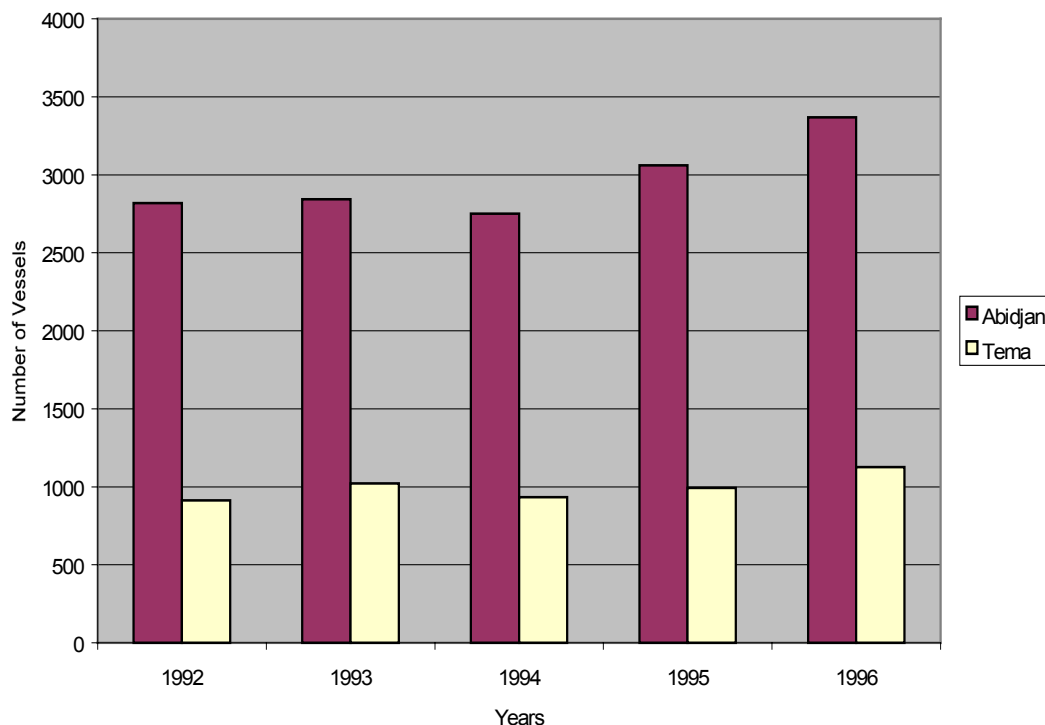
4.8 Port Performance

This section will analyse and compare port performance using different port indicators. Statistics used have been collected from individual ports; it is thus very difficult to come out with figures that are really comparable in terms of same activity.

4.8.1 Vessel Traffic

The total number of vessels handled by Abidjan port is far more than that handled by Tema port. Although the total number of vessels handled in Tema port increased by 23% from 1992 to 1997, Abidjan had 20% increase within the same period. The increase for Tema was negligible as the number of ships that call the port are few. Abidjan port however, has been handling about 67% more ships than Tema port over the past five years. Figure 4.1. shows the wide difference between the vessels handled in Tema port comparative to Abidjan port. This is mainly because Abidjan is a bigger Port as has been explained earlier and most shipowners have been using it for the transshipment of their cargo in the sub-region.

Figure 4.1.-Comparison of Vessel Traffic in Abidjan & Tema Ports : 1992 - 1996



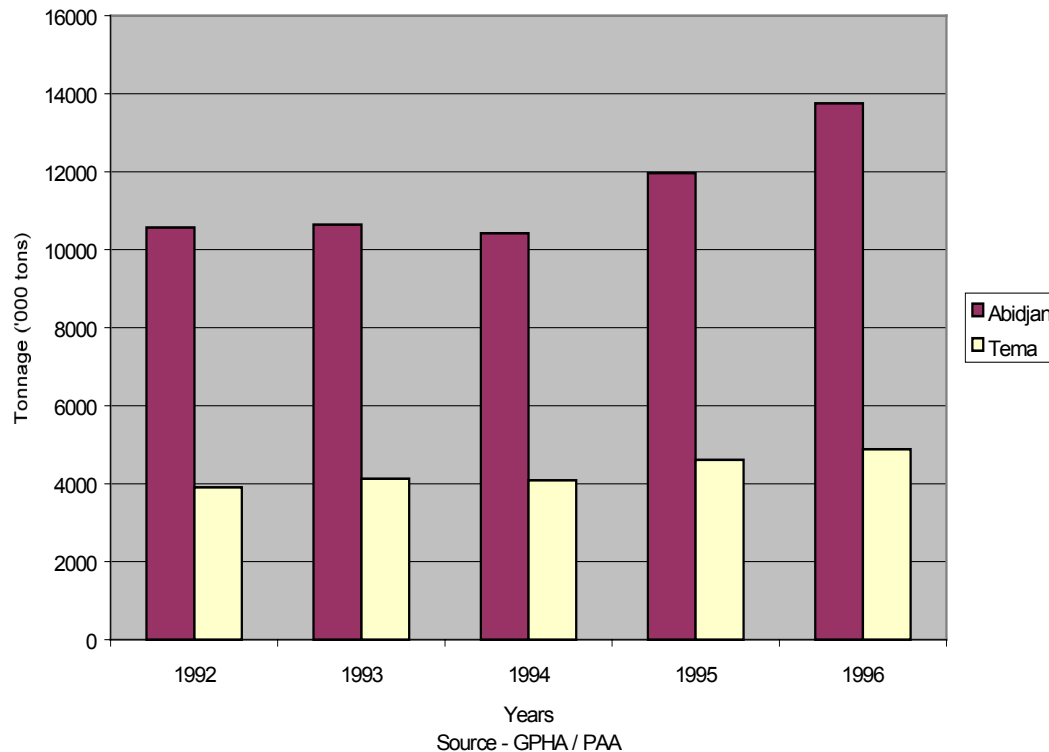
Source - GPHA / PAA

4.8.2 Port Traffic

Total cargo throughput and container traffic indicates that Abidjan port handles far more cargo in terms of tonnage and TEU than Tema port. Figure 4.2. indicate a comparison of total tonnage handled by Abidjan and Tema ports. Abidjan port handled 65% more cargo in terms of tonnage than Tema port in 1992 and 64.5% more in 1996. In terms of container tonnage as illustrated in figure 4.3, in 1992, Abidjan handled 54% more and 66% more than Tema in 1992 and 1997 respectively. Container traffic in Abidjan has been increasing at a rate of 55% from 1992 to 1997 and 39% from 1992 to 1997 in Tema port.

Transshipment traffic in Abidjan port increased from 514,000 tonnes in 1995 to about 1.2 million in 1997. Thus although transshipment activities form a total of 8.7 % of total port activity and 16% of total number of boxes handled, there are promising

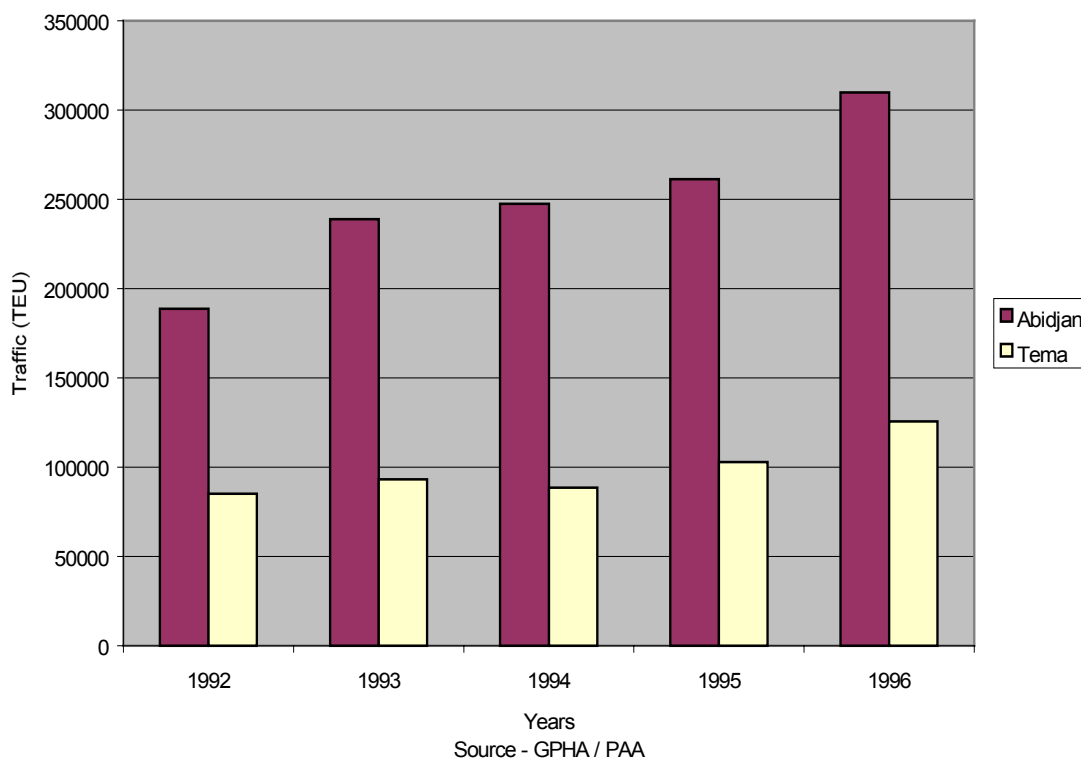
Figure 4.2. - Comparison of Total Tonnage in Abidjan & Tema Port : 1992-1996



potentials (MTM, 1998, 75). In 1997, Abidjan port handled 828,000 tonnes of goods to the landlocked countries in West Africa. The table in the appendix 9 indicates the increasing trend of transit traffic from Abidjan port to the landlocked countries. Mali is the first partner with 54% of the traffic; Burkina Faso comes second with 43.3% of traffic and Niger with 2.5% of traffic. Although transit activity takes up only 6% of total port activity, there has been a sharp increase of 60% since 1993. (MTM, 1998, 76).

Tema port is now exploiting the activities of transit cargo in the port. To boost transit cargo through the Tema port, a dedicated shed has been allocated to Burkina Faso Chamber of Commerce. An interview with the Port Operations Manager indicated that, cargo traffic has since then increased by about 2.1%. This consist of 153 TEU (0.04%) of containerised cargo, 8296 metric tonnes (1.55%) of bagged cargo and 8517 metric tonnes (0.47%) of general cargo.

Figure 4.3. - Comparison of Container Traffic in Abidjan & Tema Port : 1992-1996



4.8.3 Container turnaround time

Abidjan port has a faster turnaround of containers than Tema port. Container moves per hour is 18 and 25 at the commercial and technical rate respectively in PAA. Tema port has a rate of 16 moves per hour. However, both ports are comparable to most other terminals in other parts of the world, where containers handled is around 15 – 30 TEU per crane per hour (Foxcroft, 1997, 81). It can be inferred from the above that if Tema port is able to acquire gantry cranes container turnaround time will be greatly enhanced.

4.8.4 Productivity at Vridi Terminal in Abidjan port

The Vridi Terminal of Port of Abidjan has 7.93 TEU per gang labour productivity in 1991, which increased to 8.66 TEU per hour per gang in 1996/1997. The occupancy ratio of its container yard increased from 70% to 85% in 1991 and 1997 respectively. The average dwell time of containers on the terminals has also decreased from 18 days in 1991 to 12 days in 1997.

4.8.5 Productivity at Tema port

The Port of Tema has achieved some efficiency in port performance over the years too, although there is room for more improvement to entice shipowners. Vessel time at berth has improved by a fair margin of 3% from 1992 to 1997. Unfortunately, waiting time at anchorage has deteriorated over the years from 14.2 hours in 1992 to 17.3 hours in 1995 to 20.5 hours in 1997. This highlights the problem of limited number of deep berths at the port. On the other hand, average tonnes per net man-hour have increased over the years by 38% from 1992 to 1997. Although present productivity has seen improvement over the years, there seems to be stagnation in port productivity since 1995. This is mainly due to the increase in the number of vessels calling, without a corresponding improvement in port equipment and facilities. There is therefore a need for the port to review its strategic planning process to meet the demands and the changes in the industry.

An interview with Maersk line and OTAL representatives of West Africa indicated that vessel productivity in the Ports of Abidjan and Tema are almost the same. In Abidjan, Maersk vessels spend an average of twelve hours for the discharge operations and another twenty-four hours when they return for the export call. In Tema port, an average of about 24 hours is spent on both discharging imports and loading exports. The main difference in time, according to them is attributed to the quantity of exports loaded from Abidjan. The Table 4.3 confirms the wide variation in the import and export tonnage handled by both ports.

We can therefore conclude that, in terms of productivity both ports are efficient. But since shipowners in Abidjan port stevedore their own vessels and handle a lot more cargo than Tema port, Abidjan will be their favourite choice for a hub.

Table 4.3. - Import / Export Traffic of Abidjan & Tema Ports

| Year | Import | | Export | |
|------|-----------|-----------|-----------|---------|
| | Abidjan | Tema | Abidjan | Tema |
| 1992 | 6,486,820 | 3,118,449 | 4,082,141 | 791,212 |
| 1993 | 6,499,417 | 3,529,331 | 4,139,749 | 600,873 |
| 1994 | 6,540,868 | 3,461,570 | 3,877,142 | 628,675 |
| 1995 | 7,713,838 | 3,928,827 | 4,253,590 | 681,617 |
| 1996 | 8,210,000 | 4,190,690 | 5,540,000 | 689,243 |

Source: Abidjan Port Authority/ Ghana Port & Harbour Authority

4.9. Port Cost

This section will utilise the relative port tariff in the two ports measured in current common currency.

In Abidjan port, the government fixes the minimum rates for each activity in the port but market forces and competition dictate actual rates paid. It is therefore difficult to obtain actual market prices especially when shipping companies stevedore their own vessels. In Tema port, tariffs are fixed by GPHA with the approval from government. Discussions with some shipowners indicated that market prices of port dues are generally higher in Abidjan than Tema port, but since the shipowners bear most of the cost involved, they are able to control cost in Abidjan more than in Tema.

According to Maersk line, the port cost for a vessel size of 20,842 GRT will be USD\$7,789 in Abidjan and USD\$6,096 in Tema. However, Ghana levies a tax on imports and exports which is debited to the carrier. Port charges on containers also follow the same trend. In Abidjan, a minimum fee is paid to the Port Authority for using the port equipment. However the charges on transshipment containers is about half of the price paid for full containers.

In Tema port, transshipment containers do not enjoy many rebates. The port will therefore have to review the cost on transshipment to be able to attract transshipment cargo and be competitive on the market.

4.10. Customs Procedures

Custom operations in the sub-region prevent a seamless connectivity between modes of transportation because of their red tape and expense. Nearly all containers are stripped in the port for inspection, depriving shippers the benefit of moving the containerised goods from the port. Goods are sometimes inspected more than once and often requiring several "incentive" payments to custom officers to have the goods cleared.

The Port of Tema exemplifies the bureaucratic process as close to 100% of imported containers are stripped. There are many customs officers working in the port leading to bureaucracy in custom procedures. In addition, the few containers that are restuffed, sealed and moved inland risk being re-examined by customs whilst in transit. In addition, the cargo has to be custom bounded at two to three times its value and special custom duty must be paid. This has been a major problem hindering the use of Tema for transit cargo to the hinterland. As part of a group of port users' visit to Burkina Faso, the author noted that there are as much as twenty-seven checkpoints of police (18) and customs (9) instead of a total of the eight approved ones. Another major problem of custom clearance is the provision of escorts of customs officers to containers leaving the port. This adds extra cost to custom fees and waste a lot of time.

Clearance procedures for transshipment containers are very complicated and take a lot of time. However, the government has in recent times adopted various measures to improve custom procedures. Formerly, cargo clearance required a total of fourteen steps and this took twenty-one days. With the introduction of the ASYCUDA system, this has been reduced drastically to five steps with a maximum of three days.

The Port of Abidjan also faces several such problems. Custom officials subject to bribery and corruption have led to a lot of controls and very complex custom procedures. Thus, many bottlenecks have been set up that reduce the speed of cargo flow. However, the clearance of goods on door-to-door basis is more advanced in the transport of goods. Transit cargo is moved inland through borders without any custom escort or barriers. In addition, compared to Tema port transshipment procedures are more simplified and faster in Abidjan. Shipping companies such as Delmas and OTAL, therefore prefer to use the Abidjan port for the transshipment of cargo.

4.11. Information Technology

Exchanges of information are of key importance in any organisation. Information exchange is even more important in port activity where there is considerable flow of goods. The transport facilities involved calls for a perfect mastery of the handling of information exchanges. Information technology exchange is also important in the forecast of port operations, which is important in a global logistics approach to the transport chain. It is therefore important for any hub port to have a well-developed information technology for faster turnround of cargo and vessels,

The use of information technology in the Port of Tema is very limited. There is not a single use of IT/EDI in terminal operation activities. The main information technologies used are:

- ❑ Computerised billing system – for direct information to shippers
- ❑ Port Statistics – monthly publication that contains:
 - The list of vessel that call at the port,

- Commodity type import/export and their volumes
- Containerised cargo import/export, number of TEU, FCL, LCL and empty
- Ship turnaround time, labour productivity etc. of the port
- Berthing statistics – which provides daily publication of expected vessels arrivals and departures.

As has been stated already Ghana Customs Excise and Preventive Service (CEPS), also uses the ASCYCUDA for the clearance of cargo in the port.

Abidjan port also uses a limited amount of information technology in its operations. The Port Community has created an Information Management Committee to create a community computerisation project. This project commenced in 1998 and is expected to enhance the exchange of information among all port users.

4.12. Port Community

The involvement of port users in port development cannot be overlooked in the choice of a hub. Shipowners choose a port not only on cost and time but also on the risk - not only the risk of damage and pilferage but also of social unrest which can interrupt the transport chain between consumers and producers. The Port Community concept has three main objectives:

- Co-ordination of all individual interest within the port.
- Co-ordination with organisation outside the port area
- Port promotion.

The Port Community concept creates the "community spirit" which has far reaching implications on the day to day port life. The outcome of this is the emergence of an excellent social climate, which becomes a powerful tool to attract new clients. The presence of a port community in ports is therefore important in promoting the port into a hub in the sub-region.

On 27th December 1995, the Abidjan Port Community was officially created to defend the interest of the port by improving its image, developing constant competitiveness and undertaking dynamic promotions (Zacharie 1997, 62). The

community is composed of both regular and associate members as indicated in the table 4.4. Although the membership of the Port Community has a weakness of the absence of an employees' organisation, the present composition is very diversified and allows all the major port users to play an effective part in the organisation of the port. This has also enabled the Port of Abidjan to be more responsive to the needs of its members since the organisation is a legal entity.

Table 4.4 - Members of Abidjan Port Community

| REGULAR MEMBERS | ASSOCIATE MEMBERS |
|------------------------------------|------------------------------------|
| Abidjan Port Authority | Chamber of Commerce |
| The Union Members of Côte d'Ivoire | Chamber of Commerce (Burkina Faso) |
| Maritime Federation (FEDERMAR) | Shippers & Importer Organisation |
| Ivorian Shipping Company | External Trade Department |
| Ivorian Shippers Council | Maritime Industry Organisation |
| Custom Administration | Malian Warehousing Company |
| | Burkina Faso Shippers Council |
| | Railway & Truck Company |
| | Bank & Insurance Companies |

Source - PAA

The Port of Tema has a different form of port users' organisation known as the Port Advisory Committee organised by the Port Authority. It is not a legal entity, and all powers of the committee are vested in the Port Authority. It consists of members of the Port Authority, Freight Forwarders, Consolidators, Shipowners and Agents Association, Private stevedore companies, Customs Excise and Preventive Service, Ghana Shippers Council, Valco, Police and the Navy. The Chairman of the Committee is vested in the Director of Port and he decides when to call a meeting. The recognition of the committee does not go beyond the boundaries of the port. Thus, members are not committed since the work of the committee seems to be that of just an advisory board. The Port Authority has the discretion as to when to implement any of the decisions that are taken at committee meetings. It has therefore been very difficult for the committee's work to have any positive influence

on the port development. This has very serious implications on any future development of the port as a hub. Conspicuously absent from this committee are important organisations such as the Chamber of Commerce, the Ministry of Trade and Transport, and Truckers Organisation.

The absence of representatives from the Burkina Faso Shippers Council and Chamber of Commerce who have opened offices in the port for the transit of cargo through the Port of Tema is also noticeable.

In the author's opinion, any future development in the Port of Tema will need an independent Port Community to ensure a dynamic and competitive port. This is more so important with the present privatisation of port operations. The interests of all the organisations and people in the port are interrelated and interdependent. The port cannot reach its objectives without the support of all parties. It is only when employers, users and employees are all convinced that their future depends mainly on the cohesion in their efforts that will promote the ports to attract cargo. This is when the community concept will be fully realised. The essence of an effective port community is consensus building (Ma, 1999, 69)

4.13. Political and Government regulations.

Shipowners consider political stability as vital in the choice of a hub among other factors. This issue is considered important in the sub-region due to the political instability in most countries of the region. However, both Ghana and Cote d'Ivoire have enjoyed some political stability for the past 15 years. Unfortunately, most maritime conventions in both countries have not yet been ratified. There is therefore the need for governments to ratify the needed conventions to increase the confidence of shipowners when they are in our territorial waters and also to prevent any violations of the laws and regulations. It is also important for governments to improve on trade regulations that would provide the needed economic environment for the development of trade. The Gateway project initiated by the Government of Ghana is meant to open up the nation to economic growth through private participation.

There is also a need for a Maritime Authority to administer and co-ordinate activities in the maritime industry. Abidjan has a Maritime Authority under the supervision of the Port Authority. Ghana on the other hand does not have a Maritime Authority. This has made it difficult to co-ordinate activities in the industry for the realisation of their objectives. In a move to correct this anomaly, the government is presently discussing a bill to set up such an authority in the industry.

4.14. Conclusion

The comparison so far indicates that Abidjan port at the moment has a competitive edge over Tema port in the choice as a hub in the sub-region. Table 4.5 shows the summary of the results from the comparative analysis conducted.

Table 4.5 – Summary of Comparative Analysis between Ports of Tema and Abidjan

| CRITERIA ADOPTED | PORT OF ABIDJAN | PORT OF TEMA |
|---|--|---|
| <u>Location & links to hinterland</u> | Abidjan is nearer to most trading nations. Roads & railways well linked to the landlocked countries. | Only roads are linked to the hinterlands. Railway network is broken down |
| <u>Organisation of Port Authority</u> | Landlord Port with about 30 private operators. | Operating Port with 2 private stevedore operators |
| <u>Infrastructure</u> | Draft is 12.5m Specialised berths for container vessels Availability of land for expansion | Draft is 9.8 Container vessels handled at general cargo berths. Availability of land for expansion |
| <u>Port Services</u> | Fishing harbour with berth of 11.5m 1 dry-dock | Fishing harbour with depth of 5.8m 2 dry-docks privately operated |
| <u>Equipment</u> | 2 gantry cranes Other equipment owned by private stevedore companies | 2 portal cranes All equipment are owned by port authority and rented out to private operators. Equipment is not |

| | | |
|---|---|---|
| | | effectively maintained. |
| <u>Port Performance</u> (average of 1992-96) Vessel traffic Total tonnage (tonnes) Container traffic (TEU) Container turnaround time | 2968 per year 11469 " 249226 " 18 moves per hour | 594 per year 2294 " 99064 " 16 moves per hour |
| <u>Port Costs</u> Port costs of vessel size 20,842GRT | The market determines actual costs. Government only set a minimum rate. USD7,789 | Government fixes all cost. USD6,096 + tax |
| <u>Customs procedures</u> | Cumbersome Door to door delivery No ASCYCUDA | Cumbersome but the use of ASCYCUDA has minimised the length of steps for clearing from 14 to 6. No door to door delivery |
| <u>Port Community</u> | In existence and operates effectively, but absence of employers association in the committee | Existence of a Port Advisory Committee controlled by the port authority. Impact on port activities is very limited |
| <u>Political and Government Regulations</u> | Political stability National Maritime Authority controlled by the Port Authority. Most maritime conventions not ratified | Political stability No Maritime Authority Most maritime conventions not ratified |
| <u>Value Added Services</u> | Non existence | Non existence |

The strengths and weaknesses of Abidjan port can therefore be summed up as follows:

Strengths

- Infrastructure
- Private participation in port operation
- Well developed Port Community
- Local cargo base
- Good link to hinterland
- Availability of port equipment

Weakness

- Port Administration
- Not well developed information technology
- Clarity of port dues
- Independent Maritime Authority

The port has also a lot of opportunities to advance when we consider its long-term improvement plan on port infrastructure and political stability. However, there are a lot of threats that it faces from its competitors. The absence of Free zones, export processing zones and other value-added services poses serious threats to the long-term competitive advantage of the port. Since the shipowners operating in the port have no major investment in the port, they would not hesitate to move to another port when conditions are more favourable. This is more threatening especially with the current privatisation of many ports in the sub-region. It is therefore important for the port management to be more pro-active and respond to new developments in the port industry in order to maintain its competitive edge over other ports in the sub-region.

CHAPTER FIVE

IMPROVING THE COMPETITIVENESS OF TEMA PORT

5.1. Introduction

The previous chapter indicated that Tema port is limited in comparison to the Port of Abidjan in the choice of a hub port. However, present trends in the shipping industry give a lot of options and activities that ports can utilise to improve upon their competitiveness. This chapter is a SWOT analysis of the Port of Tema which will specify short and long term strategies that the port should implement to make it competitive. An appraisal of the projects involved will follow thereafter.

5.2. SWOT Analysis

Swot analysis is a method of reviewing the current mission of the port and to define a new one. The essence is to examine the strengths and weaknesses related to the internal review of the port while opportunities and threats reviews the port's external environment.

5.2.1. Strengths and Weaknesses

The purpose of this assessment is to determine the strengths and weaknesses of the Port of Tema in order to exploit the strengths and reduce the weaknesses so that the former is exploited while the later is reduced. The factors that are covered by this evaluation are:

- ☐ Physical assets
- ☐ Skills and experience of Port Management and labour force
- ☐ Financial conditions of the port

- ❑ Legal and regulatory framework

5.2.1.1. Strength

The Port of Tema has strengths in the following areas:

- ❑ Availability of land for expansion – the port has a vast area of land that can be used for any port expansion programme which would provide for more value-added services
- ❑ Tema port enjoys stable and published tariff, which are subject to negotiations and enables shippers to forecast on the cost of transport involved in their operations.
- ❑ Although the port has problems in respect of modern equipment and their availability, the turnaround time for vessels is very promising and competitive compared to other ports
- ❑ The port management has highly qualified staff, trained in the maritime industry. Each year GPHA educates 2 students to World Maritime University and Cardiff University. These graduates occupy management positions in the authority. The Port also has exchange programmes with the Ports of Singapore and Hamburg that provides staff with knowledge of current trends in the shipping industry. Thus the port has the needed qualified personnel to make the port more competitive.
- ❑ The port has very good financial returns. Already, loans used for the 1986 rehabilitation have been paid back and the port is a big contributor to the national revenue in terms of paying taxes and dividends.

5.2.1.2. Weaknesses

However, the port has the following weaknesses:

- ❑ Tema port is restricted in its activities because it is government owned. It is therefore difficult to separate its activities from governmental intervention. Thus, there is a frequent change in the Director General that affects the smooth operations of port activities. Enabling the port to operate commercially with some private participation will enhance its overall productivity.

- ❑ Draft restrictions and lack of specialised berths poses serious limitations on the port's operations. Thus although, the percentage of containerised trade has been increasing over the years, some traffic has been lost to other ports. Overcoming these will improve performance.
- ❑ The contribution of the port services to the clients value chain is very limited. The port has restricted itself to only stevedoring and shore handling operations over the years. There is a need for the port to diversify its operations into other value-added services. This will make use of the available idle land that is not being utilised.

5.2.2 Opportunities and Threats

Tema port enjoys a lot of opportunities that have to be fully exploited to improve upon its competitiveness.

In the first place, the government has over the years shown great interest in the development of the port. It has therefore, been monitoring activities at the port and taking active participation in promoting the port even outside the country. The government has also been willing to make the necessary changes to improve the port's activities. An example is the release of one dedicated shed for Burkina Faso for the transit of their cargo, allowing Burkina Faso Shippers Council and Chamber of Commerce to open permanent offices in the country. The Port Authority will have to utilise this opportunity to encourage the government to put in the necessary measures that will enable them to attract more cargo.

In addition, the development of the inland port at Femusua by Ghana Shippers' Council, the Free and Export Processing Zones, will generate some cargo and reduce congestion in the port. The government should therefore integrate the organisation of activities such as the inland port and Export Processing Zones into the port development programme since each complement the other.

Lastly, Ghana enjoys a measurable amount of economic and political stability. The reduction in inflation rate from 40% in 1998 to 9.4% in June 1999, (joyfinnews@gh.com) will further create the enabling environment for development of

trade and industries. The port should provide the needed infrastructure and services to meet the expected demand.

However, the position of the port in the market is threatened by its competitors in the following areas.

Most economies in the sub-region are now coming up after a long stagnation from political and economic crisis. The building of a container terminal at the Port of Cotonou port by Maersk Line poses a threat to the Port of Tema because they are all competing for the same transit cargo. The Port of Tema will have to improve upon its performance and services to be able to capture cargo to its port.

Although the government has been interested in the activities of the port it has been slow to make changes in rules and regulations that will be able to create the enabling maritime environment. The Merchant Shipping Act of Ghana (1960) for example is outdated and does not meet international standards. With the fast changes in the shipping industry, it is important that such important regulations are updated for the development of the industry.

Furthermore, the absence of a National Maritime Authority to co-ordinate activities in the industry is a big threat to the port's development. Most projects in the industry are handled singly with the concerned organisations without the needed co-ordination with the complementary agencies. This causes a lot of delays and loopholes in planning and implementation of these projects. An example is the building of the inland port at Femusua which, most organisations think, is a "Shippers' Council baby". Thus there is the absence of the necessary co-ordination to make the project a success. A National Maritime Authority is needed to direct co-ordinate and integrate all activities in the industry for a common goal.

5.3 Competitive Strategies

There are two main strategies to achieve competitive strategies in ports. These are:

- ❑ Cost leadership - reducing operating costs so as to become the low cost provider of port services and
- ❑ Differentiation - providing services that are distinct from those provided by other ports offering greater value to the port user and providing specific services for market niches.

It is important that each strategy adopted should be sustainable in order to reap the advantages. Table 6.1 shows the length of time needed for sustainability of selected competitive strategies.

Below are suggested proposals both for the short-term and the long-term.

5.3.1. Short Term Strategies

The analysis so far indicates that it is most appropriate for the port to use cost leadership strategies to achieve competitive advantages over its competitors in the short term. The Port of Tema will therefore need to:

- ❑ Lower operating cost by reducing the number of unproductive moves of port equipment. The long custom procedures in the port, lead to over use of equipment, which leads to frequent breakdowns and high maintenance cost. A reduction in these procedures will enable the port to reduce maintenance cost and offer rates that are more competitive to clients.
- ❑ Increase the utilisation of existing facilities by strengthening the engineering department in the maintenance of equipment. This is intended to reduce the number of equipment lying idle and prevent the port from hiring equipment from other sources during peak periods.
- ❑ Introduce labour shifts 24 hours a day in order to improve productivity. The integrated gang system that fully utilises the gang employed must be used to reduce cost and improve productivity. Drivers operating equipment should be trained so as to understand fully the machines operations.

Table 6.1 - Sustainability of Competitive Advantage

| Strategies | Advantage Provided | Estimated Time to Emulate (yrs) |
|--|--|--|
| Change in Corporate Identity & Mission | Overall efficiency, Market focus | 3 – 5 |
| New Site of Infrastructure | Increase in capacity, location | 2-3 |
| Management Reorganisation | Overall efficiency, Reduction in operating costs | 1-2 |
| Provision of Value-Added services for cargo and vessels (not cargo handling) | Reduced Costs for Vessels & cargo | 1-2 |
| Downsizing and/or specialising | Market focus, Reduction in Costs | 2-4 |
| Development of new facilities | Increase in Efficiency, Throughput & Capacity | 3-7 |
| Acquisition of new equipment | Increase in Efficiency, Throughput & Capacity | 1-2 |
| Free Trade Zone or Free Port Status | Market Focus, Reduced Cargo Costs | 3-5 |
| Improvement in cargo clearance | Reduced Delays, Increased Throughput | 2-4 |
| Sales and Promotion | Market Focus | 1-3 |
| Upgrading labour skills | Increase in Efficiency & Capacity | 2-3 |
| Reduction labour requirements | Increase in Efficiency | 1-5 |
| Increasing Equipment Utilisation | Reduction in Cost | 0.5-1 |
| Provision of new cargo-handling services | Market Focus, Reduced Costs for vessels & cargo | 1-2 |

- ❑ Lower port charges by segmentation of the market and differentiate port charges by ability to pay. The port can also encourage exporters and importers by granting rebates on the volumes of cargo to the port. Rebates on volumes of cargo can also be introduced so as to encourage exporters/importers in choosing the port.

The cost involved in adopting these strategies is minimal. This is because all the proposed strategies will make use of the existing facilities and still increase the competitiveness of the port.

5.3.2. Long Term Strategies

In order that the port is able to sustain its competitive advantage, there is a need to combine short-term strategies with some long-term strategies.

Long-term strategies will help develop the port towards the changing demands in the industry and enable it handle the increased traffic that will result from the success of the short-term strategies employed.

The long-term strategies will involve developing the following:

- ❑ Build a container terminal for efficient container operations and quick turnaround of container vessels
- ❑ Increase Private participation in port operation
- ❑ Provide Value-Added Services

5.3.2.1. Gateway Project

As has been stated earlier the government has already initiated the Gateway project, which will pave the way for economic development of the country. It is necessary to examine some of the agencies involved in the project because its success will assist in the implementation of the long-term strategies for the port.

a) Ghana Port and Harbour Authority

As stated previously GPHA has a sub-project under the Gateway Project. It is expected that when the necessary reforms have been implemented, the port will be able to reduce the cost of loading import containers from US\$168 in 1998 to US\$80 by the end of 1999 and to international standards by the end of 2000. In addition, there will be a further increase in the speed of unloading containers from 12 boxes per ship per hour to 20 boxes per ship by 2000. Furthermore, the average dwell time of imported containers is also expected to reduce from 25 days to 7 days by the end of 2000.

b) Customs Excise and Preventive Service (CEPS)

Under the proposed project, CEPS will develop and re-organise its corporate structure to become a trade facilitator. It will implement strategic business plan covering all required changes in regulations, operational procedures and human resources. A work program is designed to achieve ISO 9000 certification of Ghana customs and port cargo clearance processes. Special attention will also be given to the following:

- ❑ Streamlining of processes and reduction of clearance time for both export and import cargo
- ❑ Re-equip and development of adequate information technology infrastructure and
- ❑ Training on special procedures designed specifically for free zone enterprises in line with free zone regulations.

c) Country and Investment Promotion

The Ghana Investment Promotion Centre's five-year corporate plan called the "Aggressive Investment Promotion" strategy that was started in 1994 needs to be pursued vigorously. Since December 1997, 237 foreign projects have been registered in the country. In addition, the project will also finance the preparation and

implementation of strategy to develop backward linkages between foreign investors and local suppliers.

d) Trade Facilitation by Ghana Immigration Service

The project is expected to provide support to:

- ❑ Prepare standard operating procedures
- ❑ Put in place technology infrastructure
- ❑ Benchmark the immigration processing of immigration function

e) Ghana Free Zone Board

The Free Zone will be strengthened to be proactive in the provision of:

- ❑ A well targeted marketing plan (to complement GIPC's promotional efforts) for attracting free zone developers and enterprises
- ❑ Design information system architecture to provide the Board with an appropriate technological backbone to undertake all aspects of promotion and facilitator
- ❑ A comprehensive capacity building program aimed at improving service delivery.

The Gateway project is elaborate with very high objectives. The competitiveness of Tema port is dependent on the successful implementation of the agencies involved in the project. In addition, the Port of Tema cannot attain the set goals without the needed re-organisation in both management and its infrastructure. It is therefore important for the Port of Tema to complement these with realistic planning to be able to meet the set objectives. The port needs a container terminal to handle the increasing container traffic. However, there is the need for careful planning and forecast in order to determine the kind of container terminal that will meet the increase in demand for port facilities as a result of the project. The following will analyse some of the options available.

5.3.2.2. Terminal Development

The need for a container terminal for the Port of Tema to handle the projected increase in cargo cannot be over-emphasised. The port has two options for the type of terminal to build.

- ❑ Dedicated Container Terminal
- ❑ Multipurpose Terminal

5.3.2.2.1. Dedicated Container Terminal

The container terminal layout in the appendix 16 reveals the greatest difference between a conventional berth and container terminal. The quay has to be larger to accommodate the latest generation of vessels and the water depth must be adequate to accommodate the draught of container ships, import containers and marshalling area and buildings for offices, workshops etc. Also needed is expensive equipment and skilled manpower to supervise and operate them. These indicate that the cost involved in building, operating and maintaining a dedicated container is a huge investment. Thus, the alternative may be considered a better choice if the throughput of the port is not large.

5.3.2.2.2. Multipurpose Terminal

According to UNCTAD (1986), experience has shown that most ports face serious financial difficulties when they directly move from the handling of containers within a conventional berth to the construction and operation of a purpose built container terminal. The Multipurpose Terminal (Appendix 17) has been designed to bridge the gap between a conventional berth and specialised container terminal in the transitional period during which container traffic builds up alongside break-bulk unitised loads, packaged timber etc. Such a terminal has the flexibility of being suitable for handling container ships, semi-container and conventional vessels and has a mixture of equipment for lifting and carrying a range of cargo types. There is also the possibility of converting a pair of conventional general cargo berths into one

multipurpose facility at a far less expense. Thus, they are more appropriate when the throughput is not large.

In comparing the two types of terminals, it will be economically viable for the Port of Tema to build a dedicated container terminal due to the following reasons:

- ❑ The port has a number of multipurpose berths that can be used for other types of cargo
- ❑ The rate of growth of container is at 8% and expected to increase with the present economic growth
- ❑ To ensure effective and efficient port operations

5.3.2.2.3 Container Terminal Development

As stated in the previous section, the design and operation of a modern container terminal is a complex task and requires long and detailed paper work to deal with it. The following analysis will however be limited to the basic costs of building such a terminal in Tema port.

a) Terminal Layout and design

The terminal layout and design will depend on the throughput of containers expected over the life of the facility. It therefore needs a careful assessment of the market as well as historical, geographic, demographic, financial, economic and commercial factors.

Also important is the type of vessel arrival patterns and containers handled per call. The type of vessel also determines the water depth and quay design and the type of operations which will determine the equipment that would be used and the land area required.

Tema port is presently limited by draft. A deeper water depth is needed in order to attract big container vessels. Panama vessels of 6,000 TEU need drafts up to 14 metres whilst Post Panamax might need more. Tema port must now dredge to about

12 meters, the biggest attraction in the future being 4,000TEU vessels. The estimated quay length to be able to attract such vessels would be 300 metres.

b) Equipment

A mixture of different equipment is needed for the efficient operation of the terminal. Quayside gantry cranes are needed for the ship-shore container operation. Normally a minimum of two gantry cranes are required to attract fully cellular container vessels to a terminal (Drewry, 1998,68). The cost of quay cranes is indicated below.

Table 6.2 - Indicative cost of New Gantry cranes

| Type | Cost (US\$m) |
|------------------|-----------------|
| First Generation | 3.8 |
| Panamax | 6.2 |
| Post Panamax | 7.5 |

Source – Drewry Shipping Consultants Ltd. 1998

Initially, it will be more appropriate in terms of costs for the Port of Tema to invest in one Panamax quay crane till the traffic increases to the level where it will be economical to invest in more equipment.

The main yard equipment types are rubbers and rail-mounted gantry cranes, straddle carriers, forklifts/reach stackers, front-end loader, reach stackers and tractor-trailers. Each type of equipment allows a different terminal operating system, which requires different yard layout and paving types. Different equipment also gives varying capital costs and operational performance. The different types of operating system are:

- ☐ The tractor trailer system
- ☐ The straddle carriers direct system
- ☐ The straddle carriers relay system
- ☐ The yard-gantry system
- ☐ The front-end loader system

- ❑ The combination system

The tractor-trailer system is recommended for start-up operations with very low throughput. It has low maintenance cost but land utilisation is very high and initial capital cost increases when it is combined with the chassis system.

The straddle carrier is the most flexible and efficient and appropriate for port with high throughput of imports than exports. However, the direct system is more expensive than the relay system, since one ship-shore operation uses 6 straddle carriers instead of 2 or 3 in the relay system. The use of straddle carrier in terminal operation has increased significantly since 1998. The main reasons being:

- ❑ Improvement in manufacturers design, whilst prices have remained constant for the past ten years.
- ❑ Running cost has been reduced with reliability at least at the same level as RTG and RMG.
- ❑ In the atmosphere of increased ship-to-shore cranes per ship and increased number of boxes per hour for each ship-to-shore crane, the straddle carrier is the only landside system that can cope with faster ship-to-shore crane operations.
- ❑ Pressure from landside operators for fast turnaround time for road trucks that are serving the terminals is increasing and straddle carriers systems can provide the fastest service for landside operations.
- ❑ Terminals are able to reduce labour cost because it can operate with the minimum amount of equipment and thus minimum amount of labour. (Cargo Systems, 1998, 26)

The yard gantry crane, which can either be rail-mounted or rubber tyre is the most expensive but has a longer life span, stacks up to 4 high and economical in land utilisation.

The front-end loaders are versatile and more common in developing countries because of familiarity of technology and low maintenance. But they also have a high

wear on terminal surface, poor visibility when transporting containers and are slow. Thus, they are unsuitable for high throughput.

Most ports use the Combination system to combine the advantages of the equipment while minimising the disadvantages. Various options are available. For example, the straddle carrier/yard gantry crane chassis operation, where straddle carriers are used for stacking and delivery of import boxes, tractor-trailer for transfer between ship and container yard and yard gantry crane for stacking where height is needed (UNCTAD, 86, 27).

From the above description, the Port of Tema might benefit from using a combination of straddle carrier relay system with tractor-trailer and reach stacker. The reasons are:

- ❑ Tema port handles far more imports than exports
- ❑ To ensure efficient and flexible operations
- ❑ Tractor-trailers are cheaper and familiar with the port
- ❑ To ensure that the port does not invest in expensive equipment such as gantry cranes where any breakdown would mean a breakdown in operations.

c) Required Land Area

The land area required is determined by calculating the number of ground slots required using the throughput, the dwell time and the stacking height. There is an estimated peaking factor of 1.3, which is an allowance to cover fluctuations in trade, and an operational reserve factor of 1.25 (UNCTAD 1986, 21).

Thus, the total land area required by Tema port will be as follows:

| | | |
|--------------------|---|--|
| Average throughput | = | 160,000 TEU/year |
| Dwell time | = | 25 days |
| Stacking height | = | 2teu |
| Therefore slots | = | $160,000 \times 25 \times 1.3 \times 1.25 / 365$ |
| | = | 17,800 |

$$\begin{aligned}
 &\text{Total ground slots at a} \\
 &\text{Stacking height of 2} \quad = \quad 17,800/2 \\
 &\quad \quad \quad = \quad 8900 \\
 &\text{Total land area where 1teu is } 15\text{m}^2 \quad = \quad 8900 \times 15\text{m}^2 \\
 &\quad \quad \quad = \quad 133,500\text{m}^2 \\
 &\quad \quad \quad = \quad 13.4 \text{ hectares}
 \end{aligned}$$

The Port of Tema has available the above land area, it will therefore be at no cost in the building of the container terminal.

d) Civil Works Cost

The civil work cost of any port depends on the type of sub-soil, whether it is in an earthquake zone and if there is the need for land reclamation. Some costs for mobilisation would also need to be set aside. The mobilisation cost can be as high as US\$1m in less developed countries depending on the preparation of the site for receiving construction equipment, setting up a construction site office, establishing communication and moving construction equipment to the site (Drewry, 1998, 82).

The table below indicates the cost involved in civil works in Tema port using Drewry benchmarking cost.

Table 6.3 - Civil work cost for proposed container terminal in Tema port

| Item | Unit Rate | Cost \$m |
|--------------|------------------------|-------------|
| Quay | 454,000 per meter* | 16.2 |
| Paving | \$638,000 per hectare* | 8.3 |
| Buildings | Various | 1.2* |
| Services | Various | 1.5* |
| Others | Various | 1.0* |
| Total | | 28.2 |

*Source – Drewry Shipping Consultants Ltd, 1998

e) Equipment Costs

Using the straddle carrier relay system and Drewry benchmark cost in the appendix 18, the cost of yard equipment in Tema port will be as indicated in the table 6.4.

Table 6.4 - Cost of Equipment in proposed Container terminal

| Item | Unit Cost \$m | Units Required | Total Cost (\$m) |
|----------------------------|---------------|----------------|------------------|
| Quay crane | 6.2* | 1 | 6.2 |
| Spreader | 0.125* | 3 | 0.39 |
| Reach Stacker | 0.575* | 3 | 1.73 |
| Straddle Carrier | 0.89* | 3 | 2.67 |
| Tractor-trailer | 0.12* | 9 | 1.08 |
| Generator | 0.8* | 1 | 0.8 |
| Radio communication | 0.5* | | 0.5 |
| Work Vehicle | 0.14* | 2 | 0.3 |
| Computer hardware/software | 1.8* | | 1.8 |
| Others | 0.2* | | 0.2 |
| Total | | | 15.62 |

*Source - Drewry Shipping Consultants Ltd. 1998

f) Other Costs

There are other costs such as the cost of training personnel and the costs for a container freight station. The Port of Tema can still utilise the exchange programme it enjoys with the ports of Hamburg and Singapore for some practical training to reduce the costs involved. Some of the training can also be done locally, where manufactures representative will be sent to the port to provide some expertise to engineers.

In summary, the total cost of a container terminal in the Port of Tema is estimated as follows:

| | | |
|--------------------------|---|----------------|
| Civil works | - | \$28.2m |
| Quay crane | - | \$06.2m |
| Yard handling equipment- | | \$13.9m |
| Training | - | \$00.6m |
| Total | - | \$36.9m |

5.3.2.2.4. Management of the Container Terminal

Due to the huge investment in the building of the container terminal there is the need to put in the necessary procedures to operate it efficiently to attract the needed cargo. Skilled men are needed to handle the more complex equipment, to handle documents and administrative procedures while supervisors and managers must be of a high calibre who can plan, control and supervise the high speed and complex terminal operations. There is the need to streamline documentation, custom and administrative procedures and introduce computerised information systems to monitor and control movement of containers. There is also the need for the absence of government interference that will inhibit operations. It will therefore be necessary for some private participation to ensure such smooth and efficient operation. The port has the option of either outsourcing the whole project to a private investor, or entering into a joint venture for the operation of the terminal. In the author's opinion, it would be more beneficial for the port to have a joint venture with private participation in order to prevent the problem of monopoly in the management of the container terminal.

5.3.2.2. Provision of Value Added Services

Modern and efficient ports are powerful tools for facilitating and fostering trade and development. Ports now offer efficient and reliable services to ships and cargo, including communication systems, documentation and custom procedures, to allow the timely flow of goods through the transport chain which has, in fact become a production chain. To assist in this flow, there has been the development of distribution or logistic centres in the port, which are used for storage, preparation

and transformation of cargo. This is even more important in a developing country such as Ghana, where goods moving to and from the interior often spend more time and cost very high on the inland transport. Ports are therefore no longer a place for cargo exchange but are a functional element in the dynamic logistic chains through which commodities and goods flow (Juhel, 1999, 28). With the development of export processing zones, the Port of Tema will have to put in the necessary infrastructure to be able to provide such integrated transport services. There are a significant number of activities that are value-added service in the field of logistics. These can fall into two categories:

- General logistic services – storage, loading/unloading, stripping/stuffing, groupage, consolidation, distribution.
- Value Added Logistics (VAL) – repackaging, customising, assembly quality control, testing and repair.

Presently, the port does some limited form of general logistic services on imported cargo. It should welcome these activities and services as they provide revenue to the port. Already, there are some importers of car parts who unofficially assemble them in the port. The port should utilise this opportunity to provide warehouses for such dealers in the port commercial area as part of their activities. Furthermore, The Port of Tema can also provide some transport intermediary services to improve upon the total transport chain. This is necessary, as the shipper does not only calculate his transport cost on port charges but on the total transport including custom agency, freight forwarding, transport logistics etc. The Port of BremenHaven has embraced this idea and is a big logistic service provider for Benz Company. The financial investment in these activities can be enormous. In the management of these services the port could form specific companies to develop and promote such activities.

So far, the analysis indicates that the costs of investments in any port expansion or the provision of value added services could be very high. There is no data available to analyse whether they will be able to yield the necessary benefit before a choice is made. However, reference is made to a study conducted in 1995 by BCEOM on the Port of Tema, which indicated that it is economically feasible for the port to dredge to a depth of 11 metres, using the forecast of 1995-2010. (Francou, 1995). Table

5.5. indicates the different hypothesis and variations of dredging forecasted. Thus, using the 1995 forecast for the port container throughput, the return on the investment shows that it would be beneficial to dredge the port to a draft of 11m at an 11.9% rate of return. The inference drawn from this is that, with an appreciable increase in container throughput and dredging 12-metres depth, it will be very beneficial for the port when other economic factors are taken into consideration.

Table 5.5 - Cost/Benefit Analysis for dedicated container terminal in Tema Port (1995-2010)

| Variations | | | | | |
|-------------------------|------|------|-------|------|------|
| Traffic hypothesis | Low | High | High | Low | High |
| Containerisation rate | Low | High | High | Low | High |
| Dredging | 12m | 12m | 11m | 11m | Nil |
| Internal rate of return | 8.7% | 7.9% | 11.9% | 8.9% | 6.5% |

Source - Bernard Francou (BCEOM Ltd)

The next section will analyse the risk and benefits of private participation in the port and economic benefits that can be accrued from such a venture.

5.4 Risk and Benefits of increasing Private Participation in the Port of Tema

Increasing private participation in the port will have both risks and benefits.

5.4.1 Benefits

5.4.1.1 Improvement in Management

Increase in private participation will considerably improve the management of the ports. Labour employment and negotiations will be removed from the political arena

thereby avoiding underemployment in the port. Political and bureaucratic interference and red tape will be eliminated thereby leading to a more efficient and cost effective operations and maintenance of machines. The Port of Tema takes a minimum of eight to twelve months to acquire new equipment. This is due to the extensive controls and bureaucracies running from within the port to the board and the ministries. All these would be eliminated with increase in private participation. The port would also be able to adopt market-oriented pricing policies to enhance competitiveness with other ports.

5.4.1.2 Reduction in port liabilities

There will also be a reduction in port liabilities in the fields of responsibility for the safety of cargo, safety and health of labour and damage to structures since all will be transferred to the private sector.

5.4.1.3 Reduction in business risk

There will be a reduction in risk thereby encouraging private-sector equity participation, long term contracts and sharing of risk with the private sector.

5.4.1.4 Promotion of the Port

Private participation will transfer marketing responsibility to investors and encourage long-term investment. This will enable the port to be more competitive and investors will be more committed to the promotion of the port for their own benefit. This is one of the main reasons for the success of Abidjan port, where shipping lines; because they have invested heavily in the port, promote the port for their own benefit.

5.4.2 Risks

5.4.2.1 Private monopoly

There are serious risks in the establishment of private monopoly with increased private participation. This problem may be real in the Port of Tema where port traffic is not enough to attract the necessary competition by increasing the number of operators. The port should therefore set up the necessary rules and regulations to minimise this risk.

5.4.2.2 Priority of Corporate goals over Public service objectives

The Port of Tema has been subsidising some of the port cost incurred by the local community. Whilst stevedoring rates are charged in US dollars, shore-handling rates are in the local currency. This will be eliminated with the private companies' participation and port tariffs will be set according to market rates. In addition, programmes such as protecting local and public industries will be limited.

5.5 Economic Impact Analysis

Economic benefits of port investment can be analysed in terms of:

- ❑ Direct benefits to users
- ❑ Direct benefit to port
- ❑ Indirect benefits

5.5.1. Direct Benefit to Users

Port users are usually the first beneficiaries of any development in ports. They enjoy these in the form of savings in their total cost of operations. These can be in the form of savings in inland transport costs, cargo-handling costs, and insurance cost and interest expense of capital tied up in inventory. There will also be savings in ship costs at port. Furthermore, port users will have tremendous savings in total cost

of maritime transport due to a reduction in time spent at the port as a result of efficiency both for ships and clearance procedures.

5.5.2 Direct Benefit to Port

The Port of Tema will benefit directly from the implementation of these strategies. As stated previously, with an internal rate of return of about 12%, the port will gain from such an investment. This will be in the form of a substantial increase in revenue from port dues on ships, increase in net cargo handling revenue, and additional funds from leases and concessions that will be made possible by project investment.

5.5.3 Indirect Benefit

The transport industry has been one of the prime forces responsible for shifting the world from an essentially national system to the global economy that exist today. Developments in Tema port will therefore open up the national economy into the international global system thereby integrating the country into the production and consumption of global services. Port developments have a multiplier effect on the economy. Thus, any increase in port activities will increase income not only to port related activities, but also to the industrial sector as a whole. The provision of value-added services and free zones will increase the number of industries thereby creating employment, attracting foreign direct investment, and increasing foreign exchange earnings from the sale of goods and services. In addition, it will provide business opportunities for both local and foreign investors to undertake joint ventures, enhance technical and managerial skills/expertise, backward linkages and diversification of the economy, and transfer of technology. This therefore confirms the assertion of the Marketing Manager of Helsingborg Port Authority, Anders Edstrom that:

"A 2% growth in any transport development
has a 4% growth on the economy."

The development will also have a social impact in the provision of basic amenities such as hospitals, recreational facilities and better housing facilities. All these will eventually lead to an increase in the standard of living of the society.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1. Conclusion

Technological developments in container liner shipping have had a profound effect for the ports industry. Shipowners and shippers now emphasise on speed and efficient port operations that require huge shore side capital investment. Coupled with this is the development of the hub and spoke concept, which enables shipowners to provide cheap transport using bigger vessels. Most of the ports in West Africa have therefore been caught in this web and are trying to develop their infrastructure to meet these changes in the industry. It is however important that, ports in the sub-region come to terms with the reality; which is, not all ports in the sub-region can develop their infrastructure to meet the needs of shippers and shipowners. Furthermore, due to the huge cost of capital investment, it is important that ports conduct an economic appraisal of any investment that will be undertaken. The total cost of transport does not only take into account the sea and port leg, but also involves all cost incurred by the transport intermediaries. It has therefore become important that ports diversify their activities to include more value-added services, if they want their impact on the whole transport chain to be felt.

This dissertation has examined the viability of the hub and spoke system in containerised maritime transport in the sub-region by comparing the Ports of Abidjan and Tema. The aim was to find out which one has the competitive advantage in the choice of a hub port. It was seen that by applying the criteria that shippers and shipowners use, the Port of Abidjan is a better choice of a hub at the present circumstances. However, the Port of Tema has the potential to be selected/developed into a hub centre for the sub-region if the port diversifies its operations.

Chapter five assessed the strategies that Tema port will have to adopt to improve upon its competitiveness. The study established that, the Port of Tema is constraint in terms of:

- ❑ Deep draught berth and specialised container berth
- ❑ Efficient and effective port operations
- ❑ Lack of value added services.

Externally, the government has been slow to effect changes to meet the fast changing developments in the shipping industry. There is also lack of a Maritime Authority, which would effectively co-ordinate all activities of the industry in the country.

Based on the above, a combination of both short and long-term strategies were proposed to increase the competitiveness of Tema port. The short-term called for the use of cost leadership strategies that would only use the available resources to provide services at a less cost thereby improving upon their competitiveness. The short-term strategies will need to be combined with the long-term strategies to sustain the competitive advantage over a long period of time. This would involve building a dedicated container terminal with a draft of 12 meters. An appraisal of the cost involved indicated that with an internal rate of return of over 11% it would be cost effective and beneficial to invest in such a project.

The study also emphasised the need for the port to diversify and provide more value added and complementary transport services, to increase the port's contribution to the clients value chain. The Port of Tema should take up new logistical functions such as repacking, assembling, export processing, testing, and warehousing to keep up with the new demands of international trade.

Furthermore, there is need for increased private participation, both in the operation of the port and the provision of the new logistical functions. However, it is important that procedures are put in place to prevent any private monopoly in the port.

The Gateway project, which involves a re-organisation and improvement of operations of all the organisations involved in the facilitation of trade, will improve the economy as a whole. The establishment of Free Zones and Export processing zones will provide more cargo to the port, the re-organisation of CEPS and the Immigration service will facilitate the movement of cargo ships and persons in the country, thereby reducing the dwell time of both containers and cargo at the ports. The movement of goods from the Port of Tema to the hinterland will also be enhanced by improvement in custom procedures. Thus, the importance of this project on any positive improvement in the port cannot be overemphasised.

It is expected that a combination of all these improvements and developments will develop the port to be able to attract the needed cargo, shippers and shipowners. The port will enjoy increase in revenue, whilst shippers and shipowners will enjoy these in the form of savings on their total cost of operations. Furthermore the economy of Ghana will benefit from the multiplier effect of these development. The establishment of more industries will increase employment and increase foreign exchange in the sale of goods and services. Also, these developments will increase the GNP of the country, thereby creating the enabling environment for the attraction of direct foreign investment and enhance technical and managerial skills/expertise and the transfer of technology among others. Tema port will then be able to provide the needed direction for the growth of the economy.

6.2. Recommendation

The following are recommendations from the analysis conducted.

a) Adopting appropriate technology and strategic planning

Ports in the sub-region should improve upon their productivity by improving on their infrastructure. They should adopt the appropriate technology that is suited to the services and infrastructure to improve upon their profitability instead of investing in extensive infrastructure that will not yield the necessary returns. Strategic planning should therefore be adopted in all port planning for success of any investment.

Tema port should integrate strategic planning into its mission and objectives for effective management. The port's strategic planning should be reviewed occasionally to ensure that the port is meeting its set objectives.

c) Re-structuring of Organisational Structure

Organisations need to be innovative to meet the fast technological advancement. It is important for Tema port to realise that if the authority becomes a Landlord port and the administrative structures are still bureaucratic, it will still be limited in its decision making process. Thus, management needs to be given the freedom of action. The bureaucratic administrative structure should therefore be re-organised for a more horizontal structure with some decentralisation and autonomy for efficient operations of the port.

d) Port Marketing

The Port should strengthen its marketing department and involve them in the decision making of the organisation. Most concerns of port users are sidelined in decision making. Strengthening the marketing department will make the port more market oriented and be more competitive with other ports in the sub-region.

e) Port Community

Tema port needs to set up an independent Port Community. This will further enable port users to play an active role in port development. Through this, the port will also get more information about their competitors and advice on strategies to adopt.

f) Value-Added Services.

The port should move into the provision of more value-added services. The port has a vast area of idle land and a lot of warehouses in the commercial area that is under-utilised. These can be developed and leased to private operators for value added activities such as assembling, repackaging, testing and repair, quality control.

These will further increase the port role in the clients value chain and increase in port revenue.

g) Private Participation

The port should increase private participation not only in port operations but also in the provision of the proposed new logistical services. Necessary procedures to prevent any private monopoly should be avoided.

h) Inland Clearance Depot

The Gateway project has recommended a container devolving area outside the port. However, this should be developed into an inland clearance depot (ICD), jointly operated with a private investor. This will move offices and structures for clearing out of the port. The numerous custom officers will also be reduced at the port. By doing this, the port will be able to account for the usage of its resources in the clearing of cargo and charge appropriately. This will further improve safety at the port.

i) Dedicated Container Terminal

Tema port should further assess the need for a dedicated container terminal. This will solve the present problem of queuing and struggling for berth by liner vessels, provide quick turnaround time for vessels and ensure efficient handling of containers. It will further attract more vessels to the port.

j) National Maritime Authority

The government should set up a National Maritime Authority for effective co-ordination of activities in the industry. This is needed to keep the industry alive to current trends in the industry, to review maritime legislation and update them to international standards, regulate all activities in the maritime industry and act as a link between the industry and the government.

To conclude, the choice of a port as a hub involves enormous costs. Hub ports need to review their planning strategies continuously to make the port sustain its competitive advantage. Also, the success of a hub depends on efficient port operations and the provision of efficient value-added services. Shipowners are always finding better options to cut down on their costs. Thus, they would not hesitate to change ports if conditions are not favourable and do not have much investment in the port. The port chosen for a hub in the sub-region will have to be very abreast with the demands of shippers and shipowners to keep its clients and position as a hub. Thus, although Abidjan Port is the choice for the hub with the present conditions, if the Port of Tema adopts and implements the above recommendation with the Gateway Project, it will be the best alternative to be selected as hub by shippers and shipowners.

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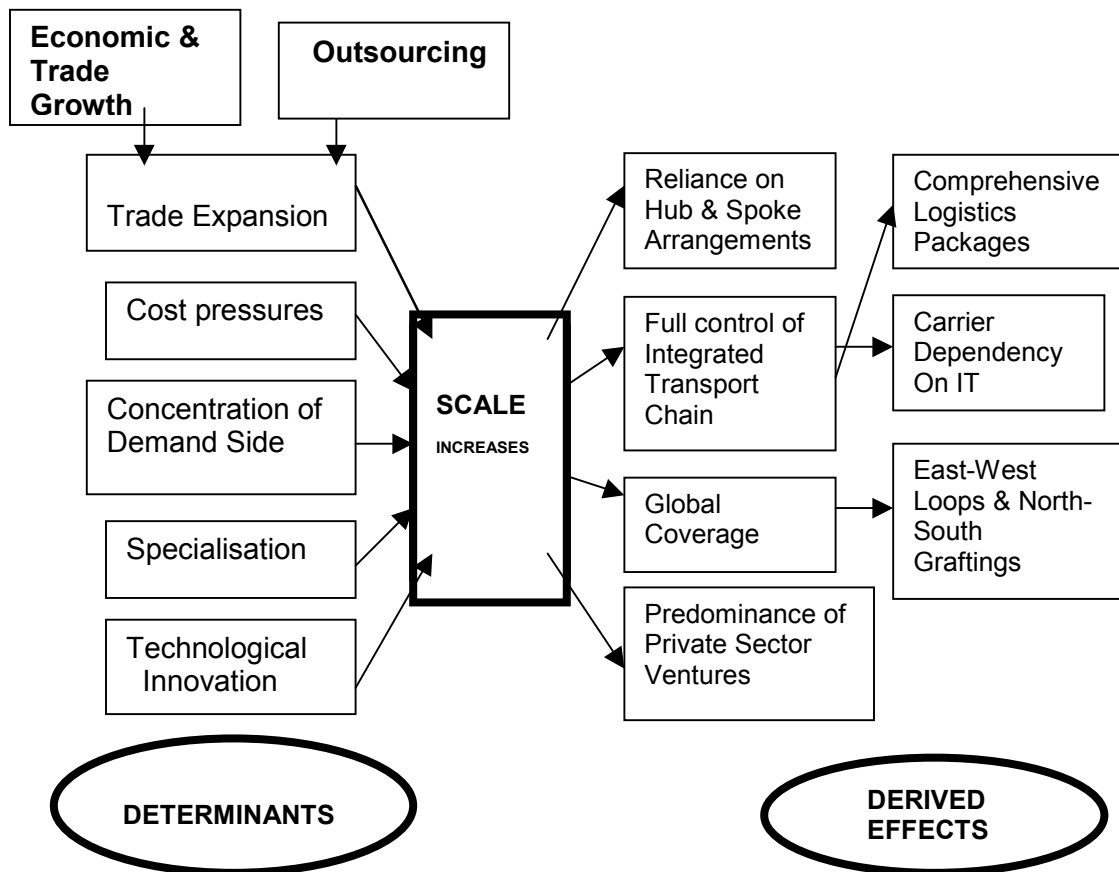
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Appendix 1 - Trends in Liner Shipping



Source : G. De Monie - 1998

Appendix 2 - GDP growth rates between 1995 & 2010 by main groups (1995=100)

| | Optimistic scenario | Pessimistic scenario |
|---------------------------|---------------------|----------------------|
| West Europe | 147 | 139 |
| East Europe | 207 | 184 |
| Former Soviet Union | 164 | 129 |
| | | |
| North America | 151 | 144 |
| Latin America / Caribbean | 181 | 163 |
| Japan | 145 | 129 |
| Dynamic Asian Economies | 255 | 221 |
| | 293 | 255 |
| Africa | | |
| Middle East | 193 | 152 |
| | 179 | 162 |

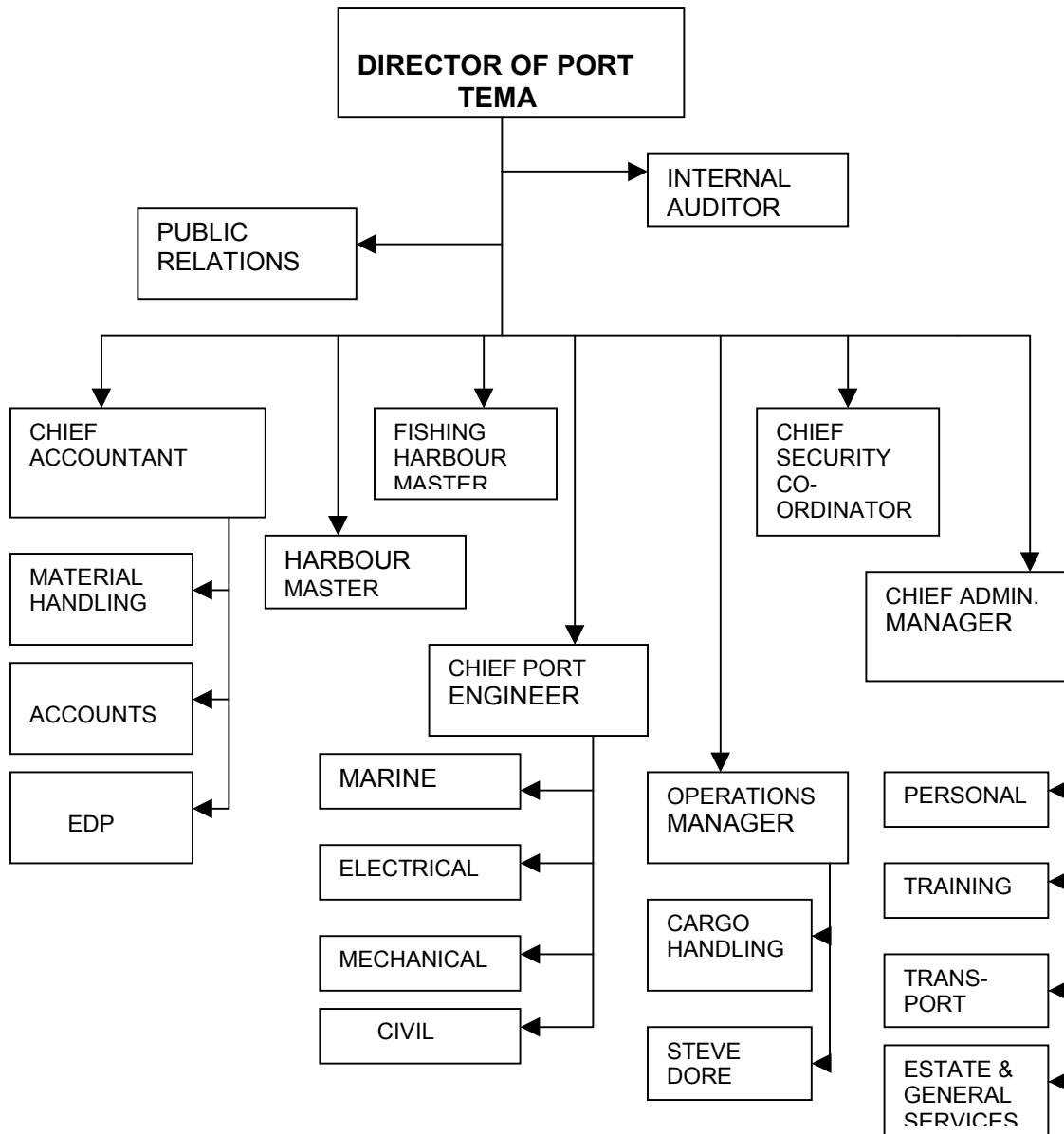
Source - Ocean Shipping Consultants

Appendix 3 - Port Container Throughput Growth between 1995 & 2010

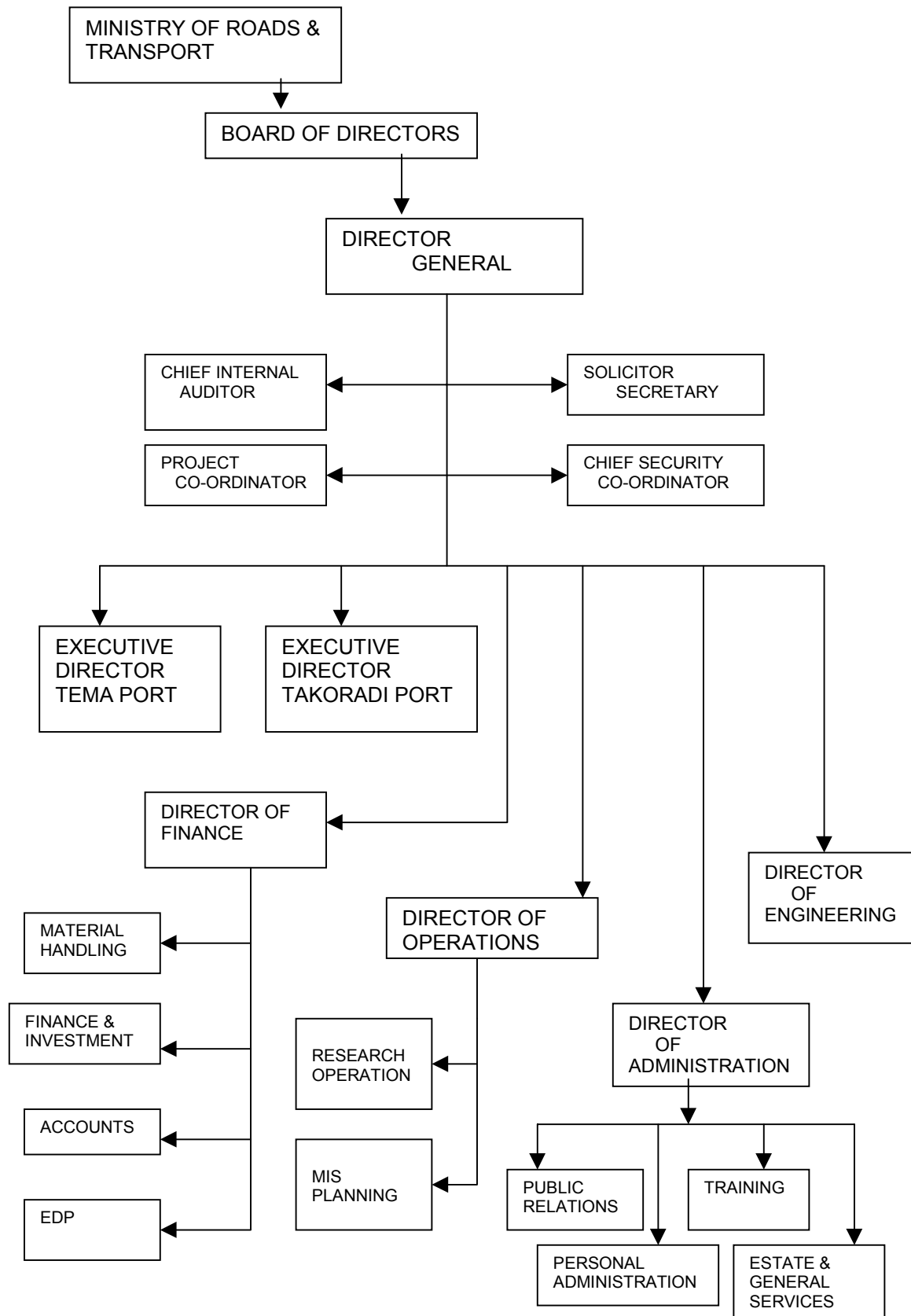
| | Optimistic scenario | | | Pessimistic scenario | | |
|------|---------------------|-----|----------|----------------------|-----|----------|
| | Index | TEU | % growth | index | TEU | % growth |
| 1995 | 100 | 142 | - | 100 | 142 | - |
| 2000 | 156 | 222 | 56 | 156 | 222 | 56 |
| 2005 | 236 | 235 | 51 | 215 | 306 | 38 |
| 2010 | 327 | 465 | 39 | 275 | 391 | 28 |

Source – Ocean Shipping Consultant

Appendix 4 - Organisational Chart of Tema Port



Appendix 5 - Organisational Structure of Ghana Ports & Harbours Authority



Appendix 8

GHANA PORTS AND HARBOURS AUTHORITY **PORT OF TEMA**

EQUIPMENT LIST AS AT 30TH OCTOBER 1998

| | | |
|-------------------------------|---|----|
| FORKLIFTS | | |
| 3 T SWL | - | 20 |
| 5 T SWL | - | 35 |
| 8 T SWL | - | 4 |
| 16 T SWL | - | 2 |
| 28 T SWL | - | 1 |
| TOPLIFTERS (CAN STACK 3-HIGH) | | |
| 40 T (20' SPREADER) | - | 1 |
| 40 T (40' SPREADER) | - | 1 |
| 40 T TELESCOPIC | - | 6 |
| REACH STACKER (45 T) | - | 2 |
| TERMINAL TRACTORS | | |
| MAFI/KALMAR TRUCKS | - | 9 |
| TOWING TRACTORS | - | 1 |
| MOBILE CRANES | | |
| 30 T SWL | - | 2 |
| 60 T SWL | - | 1 |
| 100 T SWL | - | 1 |
| PORTAL CRANES | | |
| MULPURPOSE - 40 T SWL | - | 2 |

Appendix 9

Abidjan Port - Trend of Transit traffic 1986 - 1995

| Years | Burkina Fasso | Mali | Niger | Total |
|--------------|----------------------|-------------|--------------|--------------|
| 1986 | 306,154 | 240,381 | 387 | 546,922 |
| 1987 | 277,893 | 147,350 | 678 | 425,921 |
| 1988 | 289,115 | 180,521 | 77 | 469,713 |
| 1989 | 320,623 | 154,113 | 157 | 474,893 |
| 1990 | 304,327 | 131,640 | 1,462 | 437,429 |
| 1991 | 341,437 | 182,072 | 634 | 524,143 |
| 1992 | 280,686 | 148,327 | 329 | 429,342 |
| 1993 | 302,226 | 208,361 | 2,292 | 512,897 |
| 1994 | 231,684 | 180,265 | 6,424 | 422,164 |
| 1995 | 257,557 | 295,493 | 7,608 | 573,677 |

Source: Abidjan Port Authority

Appendix 11 - Tema Port - Vessel Productivity

| Indicators | 1993 | 1994 | 1995 | 1996 | 1997 |
|---------------------------------------|------|------|------|------|------|
| Vessel turn roun-time in hours | 55.7 | 50.3 | 57.7 | 53.4 | 66.3 |
| Vessel traffic (units) | 1022 | 934 | 994 | 1126 | 1121 |
| Vessel Waiting time (hr) | 15.2 | 10.8 | 17.3 | 14.1 | 20.5 |

Source: Tema Port - Research & Development Unit

Appendix 12 - Tema Port - Ship Productivity Indicators

| Indicators | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|-------|-------|-------|-------|-------|
| Average tonne per ship hour in port | 55.3 | 62.3 | 63.1 | 63.1 | 52.9 |
| Average tonne per ship hour at berth | 65.6 | 70.1 | 82.6 | 79.8 | 68.4 |
| Average tonne per ship work at berth | 85.6 | 94.3 | 106.5 | 98.6 | 94.4 |
| Average tonne per ship day at work | 13.27 | 15.04 | 15.15 | 15.15 | 12.69 |

Source: Tema Port - Research & Development Unit

Appendix 13 - Tema Port : Average Labour Productivity

| Indicators | 1993 | 1994 | 1995 | 1996 | 1997 |
|--|------|------|------|------|------|
| Average tonne per net gang hour | 38.3 | 48.7 | 57.2 | 59.9 | 52.7 |
| Average tonne per net man hour | 3 | 3.4 | 4 | 4.1 | 4 |

Source: Tema Port - Research & Development Unit

Appendix 14 - Stevedoring rates in Tema Port

| Import/Export Load/Discharge | Container not exceeding 20 ft in length | Container exceeding 20 ft but not 40 ft in length |
|--------------------------------------|--|--|
| Stuffed Container | 63 | 119 |
| Empty Container | 50 | 90 |
| Shifts within hold | | |
| Stuffed Container | 60 | 115 |
| Empty Container | 45 | 85 |
| Shifts Container via quay | | |
| Stuffed Container | 85 | 160 |
| Empty Container | 65 | 122 |
| Transshipment (inclusive all) | | |
| Stuffed Container | 84 | 160 |
| Empty Container | 74 | 140 |

Source - GPHA Port Tariff 1997

Appendix 15 - Estimated Equipment Cost

| Item | Cost (\$000) |
|-----------------------------|---------------------|
| Quay crane | 7,100 |
| Spreader | 125 |
| Yard gantry | 1,180 |
| Reach Stacker | 575 |
| Straddle Carrier | 890 |
| Forklift (small) | 60 |
| Tractor-trailer | 120 |
| Generator | 800 |
| Radio Communication | 500 |
| Work Vehicle | 14 |
| Computer Hardware &Software | 1,800 |
| Others | 400 |

Source - Drewry Shipping Consultant Ltd. (1998)