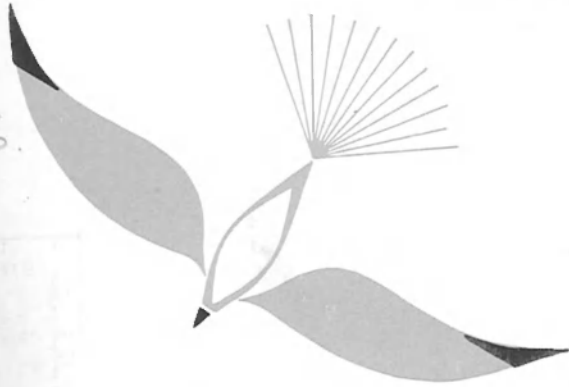


... Institute of Social Research (831)

African  
studies. no. 26.



THE  
**seaports**  
OF  
EAST AFRICA


B. S. HOYLE

*A Geographical Study*



EAST AFRICAN STUDIES 26

**The Seaports**  
of East Africa



*Written under the auspices of  
The Makerere Institute of Social Research,  
Kampala, Uganda*

# The Seaports of East Africa

A geographical study

B. S. HOYLE, M.A., Ph.D.

EAST AFRICAN PUBLISHING HOUSE  
Uniafric House, Koinange Street  
P.O. Box 30571, Nairobi

*First published 1967*

Copyright © Makerere Institute of Social  
Research, Kampala, 1967

# Contents

<i>List of figures</i>	vii
<i>List of tables</i>	viii-ix
<i>Preface</i>	xi

## 1 GENERAL INTRODUCTION

Some aims and concepts in port geography . . . . .	1
--	---

## 2 THE GEOGRAPHICAL SETTING OF THE SEAPORTS OF EAST AFRICA

Harbours and ports . . . . .	7
Situation and site . . . . .	7
Factors involved in situation . . . . .	9
Site conditions . . . . .	14

## 3 THE MODERN DEVELOPMENT OF THE SEAPORTS OF EAST AFRICA

The concept of 'Anyport' . . . . .	26
The application of the concept of 'Anyport' to the seaports of East Africa . . . . .	29
The modern development of Tanga . . . . .	37
The origin and growth of Dar es Salaam . . . . .	39
The foundation and development of Mtwara . . . . .	45

## 4 PORT EQUIPMENT AND ORGANIZATION

Port facilities at the four ocean terminals . . . . .	52
The inadequacy of present port facilities . . . . .	56
Port capacity and port efficiency . . . . .	59
The organization of port working . . . . .	60

## CONTENTS

5	THE STRUCTURE OF PORT TRAFFIC	
	Shipping movements . . . . .	62
	The general pattern of cargo traffic . . . . .	64
	Export cargo traffic . . . . .	65
	Import cargo traffic . . . . .	72
	Passenger traffic . . . . .	75
6	THE HINTERLANDS OF THE PORTS	
	The concept of the hinterland . . . . .	76
	Export hinterlands . . . . .	77
	Import hinterlands . . . . .	90
	Composite hinterlands . . . . .	91
7	THE PORT OF ZANZIBAR	
	Situation . . . . .	97
	Site conditions . . . . .	98
	The development of port facilities . . . . .	101
	Port equipment and organization . . . . .	104
	The structure of port traffic . . . . .	105
	The hinterland . . . . .	111
8	CONCLUSION: THE SEAPORTS OF EAST AFRICA IN THEIR REGIONAL PERSPECTIVE . . . . .	120
	Appendix A — Statistical note . . . . .	134
	Appendix B — Select bibliography . . . . .	134
	Appendix C — Map references . . . . .	136

## LIST OF FIGURES

1. Factors involved in the situation of the seaports of East Africa . . . . .	10
2. The pattern of surface transport services in East Africa . . . . .	11
3. The site of Mombasa . . . . .	16
4. The site of Tanga . . . . .	19
5. The site of Dar es Salaam . . . . .	21
6. The site of Mtwara . . . . .	23
7. Port facilities at Mombasa . . . . .	55
8. Port facilities at Dar es Salaam . . . . .	56
9. Volume of cargo traffic at the seaports of East Africa, 1963 . . . . .	63
10. The coffee hinterland of Mombasa . . . . .	78
11. The cotton hinterland of Mombasa . . . . .	80
12. The cotton hinterland of Mombasa: Uganda . . . . .	81
13. The sisal hinterland of Mombasa . . . . .	83
14. The tea hinterland of Mombasa . . . . .	84
15. The sisal hinterland of Dar es Salaam . . . . .	85
16. The cotton hinterland of Dar es Salaam . . . . .	86
17. The sisal hinterland of Tanga . . . . .	87
18. The cashew nut hinterland of Mtwara . . . . .	89
19. The composite hinterlands of the seaports of East Africa . . . . .	92
20. Zanzibar harbour . . . . .	99
21. The evolution of port facilities at Zanzibar . . . . .	102
22. Production of cloves in Zanzibar and Pemba Islands, 1934-35 to 1964-65, by volume and percentage . . . . .	112

Note:—All maps are orientated with north at the top.



## LIST OF TABLES

1. Particular and relative defects in the location of each East African seaport . . . . .	24
2. Summary of the general theme of the development of a major British seaport . . . . .	28
3. Summary of the general theme of the development of a major East African seaport . . . . .	30
4. Comparison of dates of the termination of port development eras at major East African seaports . . . . .	31
5. Eras and epochs in the development of the port of Mombasa . . . . .	34
6. Eras and epochs in the development of the port of Tanga . . . . .	38
7. Eras and epochs in the development of the port of Dar es Salaam . . . . .	40
8. Eras and epochs in the development of the port of Mtwara . . . . .	45
9. East African seaports: facilities and equipment . . . . .	53
10. Cargo handled at major East African mainland seaports, 1963 . . . . .	64
11. Mombasa: volume and value of principal commodities exported, 1963 . . . . .	66
12. Dar es Salaam: volume and value of principal commodities exported, 1963 . . . . .	68
13. Tanga: volume and value of principal commodities exported, 1963 . . . . .	70
14. Mtwara: volume and value of principal commodities exported, 1963 . . . . .	70
15. Mombasa: volume of principal commodities imported, 1963 . . . . .	73
16. Dar es Salaam: volume of principal commodities imported, 1963 . . . . .	73
17. Tanga: volume of principal commodities imported, 1963 . . . . .	74
18. Mtwara: volume of principal commodities imported, 1963 . . . . .	74

## TABLES

19.	Eras and epochs in the development of the port of Zanzibar . . . . .	103
20.	Total tonnages of cargo handled at the port of Zanzibar, 1951-64 . . . . .	106
21.	Value of cargo traffic at Zanzibar, 1959-63 (average) . . . . .	107
22.	Volume and value of principal commodities exported through the port of Zanzibar, 1963 . . . . .	107
23.	Value of principal commodities imported through the port of Zanzibar, 1963 (with volume statistics where appropriate) . . . . .	110
24.	Destination of clove exports from Zanzibar, 1959-63 . . . . .	116
25.	External trade of Zanzibar, 1963 . . . . .	117
26.	Percentage of total traffic of major East African mainland seaports handled at individual terminals, 1949-64 . . . . .	130

## PREFACE

The coasts of Kenya and Tanzania offer five principal sea-ports: Mombasa, Tanga, Zanzibar, Dar es Salaam and Mtwara. No fully-documented, comparative survey of these ocean-terminals has previously been made, and this study attempts to analyse from a geographical viewpoint the development of the sea-ports and their present role in the expanding economies of the East African countries. The present port group is the successor to many earlier hierarchies, although the primacy of the two larger terminals of Mombasa and Dar es Salaam is today ensured by extensive rail links with the hinterland. Most of the sea-ports are advantageously situated in relation to both maritime and land conditions, and their detailed land and water sites have presented few major obstacles to their modern growth. There is a fundamental similarity in the pattern of development followed at each port, yet the level and range of equipment varies between wide limits and complaints of congestion are heard with increasing frequency. The sea-ports play an essential and often unappreciated role in the economy of East Africa, linking together the land and sea transport networks, and they are likely to demand increasing attention and considerable further capital investment as the economic development of East Africa proceeds and as greater demands are consequently placed upon the ocean terminals.

The research upon which this book is based was undertaken between 1961 and 1965 during the tenure of an Assistant Lectureship (1960-62) and subsequently a Lectureship (1962-66) in Geography at Makerere University College, and the results were presented in 1966 as a thesis for the Ph.D. degree of the University of London. Assistance given generously from many quarters during the course of the research is gratefully acknowledged; in particular, financial aid from the Makerere University College Publications and Research Grants Committee facilitated several visits to the East African coast and also permitted the publication of the present revised and shortened form of the original thesis. The collection of material was aided by many persons too numerous to mention individually, but acknowledgement must

## PREFACE

chiefly be made to members of the staff of the East African Railways and Harbours Administration who, in Nairobi and at the ports, in person and by correspondence, proved most helpful in answering my detailed inquiries and in permitting me to use internal records. Thanks are due also to Mr. J. Sebunnya and Mr. A. Serubiri for assistance with the preparation of the figures. Finally, the advice and interest of my university supervisors — Professor S. J. K. Baker at Makerere University College, and Dr. J. H. Bird at University College, London — has proved a constant source of encouragement from the initiation of the project to its completion. The conclusions reached nevertheless remain my own. Although I fully realize that many of those who sail the ships, work the cargo and administer the ports know far more about shipping and port traffic than I do, I nevertheless hope that any representatives of port authorities who chance to read these pages may find in them something of value in the form of reference material or new viewpoints on familiar scenes.

B. S. H.

*University College of Wales, Aberystwyth  
September 1966*

# I

## GENERAL INTRODUCTION

The seaports of the African continent, like seaports elsewhere, are principally significant as points of economic and cultural contact. In an historical context the coasts of Africa have acted as a vital link between the continent, the interior of which was so long unknown to the rest of the world, and the overseas trader, invader or ruler. Many of the forces that have influenced the modern development of Africa have entered through seaports, but at the present time the progress of African economic development has not yet reached a stage where internal trade rivals external trade in quantity or value. The developing economies of the countries of modern Africa are thus markedly orientated, through the seaports, towards external export markets and sources of imported goods; and those countries which, because of their inland situation, are devoid of seaports, find themselves today at a significant disadvantage as compared to their neighbours equipped with direct access to one or more ocean terminals.

This study of the seaports of East Africa has been largely inspired by three factors: the general significance of the role of seaports in the economic development of the area, a role that is often unappreciated or underestimated; the general lack of detailed information on the seaports, in unofficial literature at least; and the numerous interesting developments in facilities, organization and traffic that have recently taken place at the ports. The major seaports of East Africa are defined here as, from north to south, Mombasa, Tanga, Zanzibar, Dar es Salaam and Mtwara. There are a number of smaller seaports along the East African coast, and the present selection has been made on the basis of four principal criteria, of which at least one applies to each of the five individual terminals. These criteria are (a) a total volume of traffic exceeding one million harbour tons<sup>1</sup> a year; (b) rail connections with an extensive hinterland; (c) deep-water berths; and (d) ability to accept deep-sea vessels and not merely coastal shipping. Mombasa and Dar es Salaam fulfil all these criteria; Tanga has rail links and ocean shipping, but handles only a relatively small tonnage of goods and remains a

lighterage port; and Mtwara, which accepts deep-sea ships at its deep-water quay, has no railway and only a very small amount of traffic. Zanzibar is included, mainly on the basis of the fourth criterion, that of ocean *versus* coastal shipping, but also because of its intrinsic interest and in view of its predominance amongst East African seaports in the later nineteenth century. The next port in the present hierarchy of the East African coast is Lindi, which handles under 50,000 harbour tons of cargo a year, has no railway or deep-water quay, and since 1962 has accepted only coastal vessels since all deep-sea shipping in southern Tanzania is now concentrated at Mtwara. Lindi is therefore excluded from consideration, and attention is focussed upon the four major mainland ocean terminals and upon the port of Zanzibar. The minimum limit set for inclusion may seem rather low, but the smaller ports of Tanga, Zanzibar and Mtwara form a significant part of the general pattern, dealing with commodities that are very important in a local context as well as serving a large population.

In the analyses of physical circumstances and of traffic movements an attempt is made throughout to maintain a degree of comparability between the four major mainland terminals, since the most significant differences between them are associated with the extent rather than the pattern of their development. The nature of available data does not permit precisely the same method of treatment in the case of Zanzibar, but as far as possible the general method adopted for the mainland terminals is followed in the treatment of that port. Although the study is concerned primarily with present conditions, focussing essentially upon the description and interpretation of what happens at the quayside today, some attention must inevitably be devoted to the past. Chapter III provides the historical background essential to an understanding of modern patterns; this chapter makes no claim to add new facts to our knowledge of the history of East Africa, but its inclusion in the work seems justified because of the need to examine present geographical phenomena in a chronological as well as a chorological context, and by the need to emphasize the long-established continuity of trade relations on the East African coast.

#### **Some aims and concepts in port geography**

Certain basic questions may be asked in order to direct attention towards those aspects of ports in which the geographer has a special interest. These aspects are essentially those which

tend to illustrate and emphasize relationships between apparently separate sets of factors. The first of these questions is quite simply: "Where is the port?" The location of a seaport may be studied geographically in a fourfold sense. A broad view of the geographical position of the port in its regional setting is described as the *situation*, and a closer view of the geographical nature of the area on which the port is actually developed is a study of the *site*; and it is necessary to look at both these aspects in terms of the land environment and in terms of the water environment. Any seaport thus has, in the geographer's conception, a land situation and a land site, a water situation and a water site; and a satisfactory answer to the question "Where is the port?" involves an examination from these four distinct viewpoints. Such an answer emphasizes the fundamental function of a port as a place of contact between land and maritime space, and also illustrates at the outset the close interaction of physical and human influences on the development of a seaport. Although the study of site is often largely in terms of physical geography, sites can also be greatly modified by man or even created artificially where the need exists and where the cost is justified in economic or political terms. Situation is also a concept involving both physical and human phenomena, the latter frequently emerging as the more significant.

A second major concern in port geography is introduced by the question "Why there?"; that is to say, why is the port situated and sited where it is, and nowhere else? In the case of any individual seaport the answer to this question is of considerable complexity, for if developed fully it requires not only a further comment on situation and site (in relation to other possible locations), but also an analysis of the historical geography of the port from its origins to the present day, leading to a study of the present economic and political conditions under which the port operates. The geographer's task is not merely to analyse the present landscape; it is also to interpret it. No adequate interpretation of present patterns can be made without recourse to the evidence provided by the ever-changing physical and, more especially, human conditions which have so profoundly influenced the present scene.

Having established, as far as it is possible to do so, the geographical *rationale* underlying the situation, site and chronological development of a port, the geographer's further interest in the subject lies in two main spheres: the facilities and functions of the port area itself, and the related patterns of activity

in the hinterland. "The essential task", writes James Bird, "is to trace the development of those areas where the function of transshipment is carried out".<sup>2</sup> Naturally the port area cannot be realistically considered in artificial isolation, yet it is necessary at this stage to look closely at the facilities with which the port is equipped for the handling of goods and passengers, particularly since these facilities provide a rough but useful indication of the extent and significance of the activity of a port. The next question must logically be: "What use is made of these facilities?" Here we come to one of the most essential aspects of port study — the statistical analysis of patterns of commodity flow through the port. The nature of the goods handled and the direction of their movement give a clear indication of the character of a port, whilst value and tonnage statistics help to form an estimate of the relative significance of the port compared to others elsewhere. It is essential to distinguish between different categories and types of cargo, especially between bulk cargoes that are easily handled and require little labour, and general cargoes which are more varied and need individual handling.

To an even greater extent than most other geographical features, it is impossible to consider a port in isolation, except for academic convenience. An examination of the facilities and activities of the port area must therefore be enlarged to include a study of the port in a much wider setting, in terms of the hinterland on the landward side and also in terms of the sea routes and the foreland on the maritime side. In this aspect of port study lie the explanations underlying the features of the port itself, and indeed the reasons for the very existence of the port. An item of immediate interest in this context is the provenance of the principal export and import commodities which the port handles. A study of exports sets the port very firmly in its regional and national context, in relation to the economy of the country within which it lies. In East Africa, as frequently elsewhere, a distinction may be made between exports originating within the immediate environment of the port town, cargoes from various parts of the country in which the port is situated, and goods passing through the port from sources beyond the national boundaries. In dealing with imports it is also possible to distinguish between goods destined for local, national or extra-national consumption, and it is of interest to examine the relative significance of various parts of the maritime foreland in terms of the sources of imported commodities.

A different question, but one closely related to the move-



ment of goods, concerns means of transportation. This question is concerned not only with the different types of ships using the port, but also with the road, rail and inland waterway systems serving the port on the landward side. The various types of ocean carriers are chiefly of geographical interest in so far as they affect the development of port facilities, although, as will be made clear in Chapter III, the evolution of shipping in terms of size and manoeuvrability has profoundly influenced the very sites of ports. Specialized shipping, for example oil-tankers, needs special facilities and creates special problems. Very often a vital question, as Weigend points out,<sup>3</sup> is whether dredging to a given depth is economically feasible in relation to actual or potential traffic flow through the port.

The problem of the hinterland of the port is thus analysed in terms of land transport routeways, sources of export commodities and destination of imports, that is in terms of the area the port serves and the means by which it does so. This creates a complex geographical pattern, and there is a sense in which it is more accurate to speak of many individual hinterlands (for example, the coffee hinterland of Mombasa, or the sisal hinterland of Tanga) rather than of one composite hinterland which may not in fact mean a great deal. Few ports can claim an exclusive hinterland; there is almost invariably a considerable degree of overlap between the hinterlands of one port and those of another. This is certainly the case in East Africa, and attention will be directed at a later stage to the patterns and problems of 'hinterland overlapping' in this area. In contrast with many other parts of the world, however, the large size of East Africa and the small number of ocean terminals enables one to say with some justification that many areas lie within the exclusive hinterland of a particular port.

Outside the immediate area of the port itself, therefore, the geographer's interest lies mainly in the patterns of activity in the hinterland and the relationship of these to the port itself. In general the main concepts and aims of port geography tend towards the building up of a picture of the port not in isolation but in its proper context of area and time. One of the main purposes of geography is to analyse relational patterns, and the application of this technique to the study of ports represents a useful method of approach.

*Notes and References*

1. A harbour ton is the unit of measurement for cargo by weight or cubic capacity, whichever yields the greater charge, as defined by the Tariffs of Harbour Dues and Charges. Unless otherwise specified a harbour ton is either 2,240 lbs. (i.e. a deadweight ton) or 40 cubic feet. Heavy materials such as cement are thus recorded in deadweight tons, whereas general cargo, being lighter and often more bulky, is recorded and charged in harbour tons.
2. J. H. Bird, *The geography of the port of London* (London, Hutchinson, 1947), p. 14.
3. G. G. Weigend, 'Some elements in the study of port geography', *Geogr. rev.*, 48, 1958, 185-200 (see p. 191).

## 2

### THE GEOGRAPHICAL SETTING OF THE SEAPORTS OF EAST AFRICA

#### **Harbours and ports**

In describing the physical conditions that have influenced the growth of a port, there is an important distinction between the harbour, which is the sheltered area of deep water, and the port installations where the transshipment of cargo and passengers takes place. Some degree of shelter, natural or artificial, is essential for port development, and a vital factor involved in the classification of port facilities is the extent of the sheltered deep water area at a given state of the tide, usually at low water of ordinary spring tides (L.W.O.S.T.). The conditions of the harbour, in its natural or improved state, and the level of development of port facilities within the harbour, thus present two distinct sets of facts, the relationships between which are very variable. A harbour in its natural state is frequently quite inadequate for more than elementary port development, but because traffic is concentrated at a particular point extensive artificial additions must be undertaken. On the other hand, excellent natural harbours sometimes remain for long periods relatively or even completely unfrequented by commercial traffic, since the particular stretches of coast on which they lie are not important in terms of the land and sea exchanges of their region. In East Africa the inadequacy of the series of natural harbours is only now beginning to be felt, but the effect of interior communication links on the comparative development of the various seaports is very marked.

#### **Situation and site**

These points draw attention to a further distinction that must be mentioned at the outset, and which is the main subject of this chapter. This is the distinction between situation and site. The special significance given by urban geographers to these terms is now well established and deserves to be followed by those concerned with the geography of ports. The situation is the geographical position of a port in a broad sense — the physical, human and especially the economic environment within which

the port lies on the landward side, and, on the seaward side, the port's relationship to world sea-lanes and to other seaports of significance. The site, in contrast, is the area of land and associated waters on which the port and port town are actually developed: the configuration of the harbour and the conditions of area, depth, temperature and movement of the waters within it; and to these may be added the details of the topography, drainage, stability and aspect of the site of the port town. These two distinct approaches, the broader and the closer view, are necessarily complementary and form an essential basis to the study of the geography of any seaport. Clearly, the development of a seaport is normally governed to a far greater extent by the general situation than by conditions of the immediate site. As Professor Smailes remarks: "However magnificent a site may be for the approach and accommodation of shipping in a sheltered harbour, it cannot create a port unless the situation allows the development of the all-important relations with the hinterland".<sup>1</sup> The physical configuration of a land area, and the concentration of routeways upon particular stretches of coast, not infrequently make necessary the development of seaports in areas where natural harbour facilities are entirely absent; probably the best African example of this situation is provided by the new port of Tema in south-eastern Ghana.<sup>2</sup> On the other hand the small (but in a limited sense excellent) natural harbours at Dar es Salaam and Mtwara were virtually unused until the late nineteenth and mid-twentieth centuries respectively. In spite of the greater general significance of situation, however, the details of site conditions exert a marked control over the pattern (rather than the level) of development at a port.

The question of the relative significance of situation and site in port development takes on a slightly new aspect in East Africa when it is remembered that it was essentially from the seaward rather than the landward side that the seaports of this area were initially developed. In the case of Mombasa, the only East African seaport of major significance in both medieval and modern times, the dual existence of a defensive island site for the town and of a harbour offering in past times adequate shelter for sailing craft and in modern times plentiful deep water has encouraged continuous activity and development. The penetration of the interior by the railway, coupled with the economic growth of Kenya and Uganda in the present century, has involved the development of a hinterland focused upon one particular outlet. This contrasts markedly with conditions in Europe where

a developing area is often in a position to choose amongst various potential outlets.<sup>3</sup> The situation of the other three major seaports of East Africa is much the same, in that each was initially selected as a good harbour and port site by Arab or European traders and administrators; each became the starting point of a railway to the interior; and each in some degree was able to build up an extensive and largely exclusive hinterland focused upon a single point of outlet.

#### Factors involved in situation

Whereas the study of the site of a port may be pursued in relative isolation, the concept of situation implies relationships over a wide area with a variety of physical and cultural factors. It is possible accordingly to examine in general terms some of these relationships for the East African port group as a whole. Figure 1 attempts to show some of the factors involved in the situation of the seaports of East Africa: monsoonal conditions and traffic directions in the Indian Ocean; the main railways; and the distribution of relatively high and relatively well-watered areas. Most, but not all, of the main source-areas of export produce lie within the zones indicated as receiving over 30 inches of rainfall and lying over 3,000 feet above sea-level. Some of the major points illustrated by the map are elaborated below.

(a) *Indian Ocean commerce and routeways.* A fundamental factor in the general situation of the East African port group is its relationship to past and present patterns of trade and transport in the Indian Ocean. The East African coastlands prior to the nineteenth century were essentially part of the western shore of the Indian Ocean, a significant element within a widespread network of trading towns and ports stretching in medieval times through south-western Asia to China. Although trade with India is still significant, it is the coastwise routes towards the Cape and towards Europe that dominate. Traffic through the north-western part of the Indian Ocean and the Red Sea to the Mediterranean and north-western Europe owes its modern development, of course, to the opening of the Suez Canal in 1869; the existence of this canal is perhaps the most vital single factor in the situation of the modern seaports of East Africa, although trading connections with the Mediterranean, somewhat tenuous at times, date back to the classical world of ancient Rome.

(b) *The development of interior communications.* On the landward side, the principal single factor to which the situation of the seaports of East Africa may be related is the pattern of com-

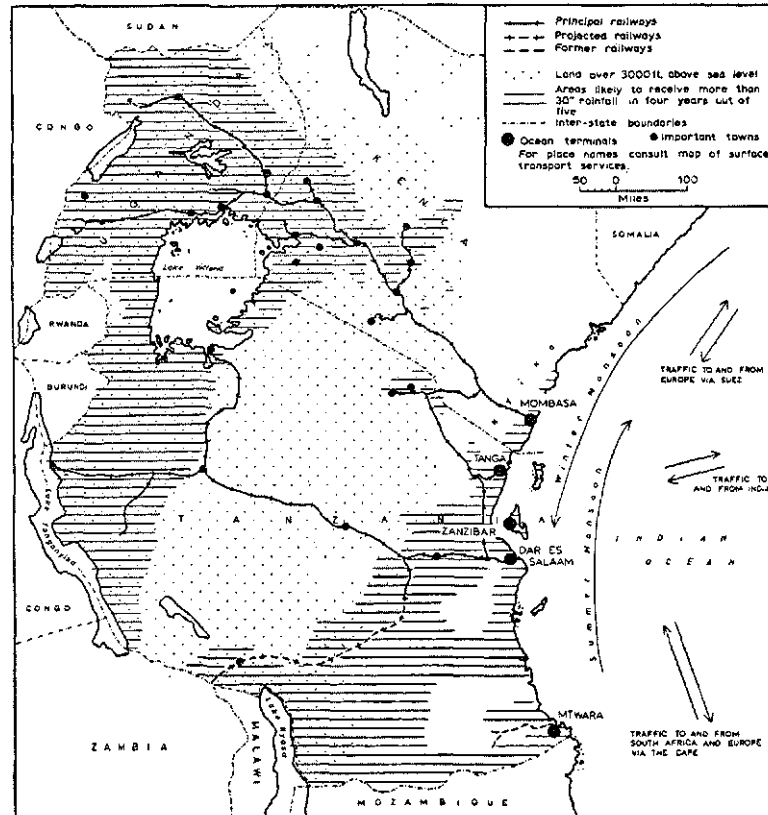


Figure 1. Factors involved in the situation of the seaports of East Africa

Relief and rainfall data from maps accompanying E. W. Russell (ed.), *The natural resources of East Africa* (Nairobi: East African Literature Bureau, 1962).

munications, especially that of railways (Fig. 2). The relationship is an intimate and obvious one for, as mentioned above, it was precisely from selected port sites that railways were built westwards to serve the interior, and through these points and routes of entry that the modern economy of East Africa has been built up. Further, since there are no major river transport routes penetrating the interior, the hinterlands of the various ports are closely related to the areas directly served by rail, which are (somewhat fortuitously in some cases) the areas where economic development is most advanced. The development of the pattern of railway communications in East Africa is of vital significance to the growth

and functions of the seaports. The port of Tanga illustrates particularly well the fact that port development reflects directly the extent of communications with the interior; although the first East African seaport to be established in modern times, Tanga is now overshadowed by both Mombasa and Dar es Salaam not only because their harbour facilities are better but also because they have rail feeders penetrating far deeper into the interior.

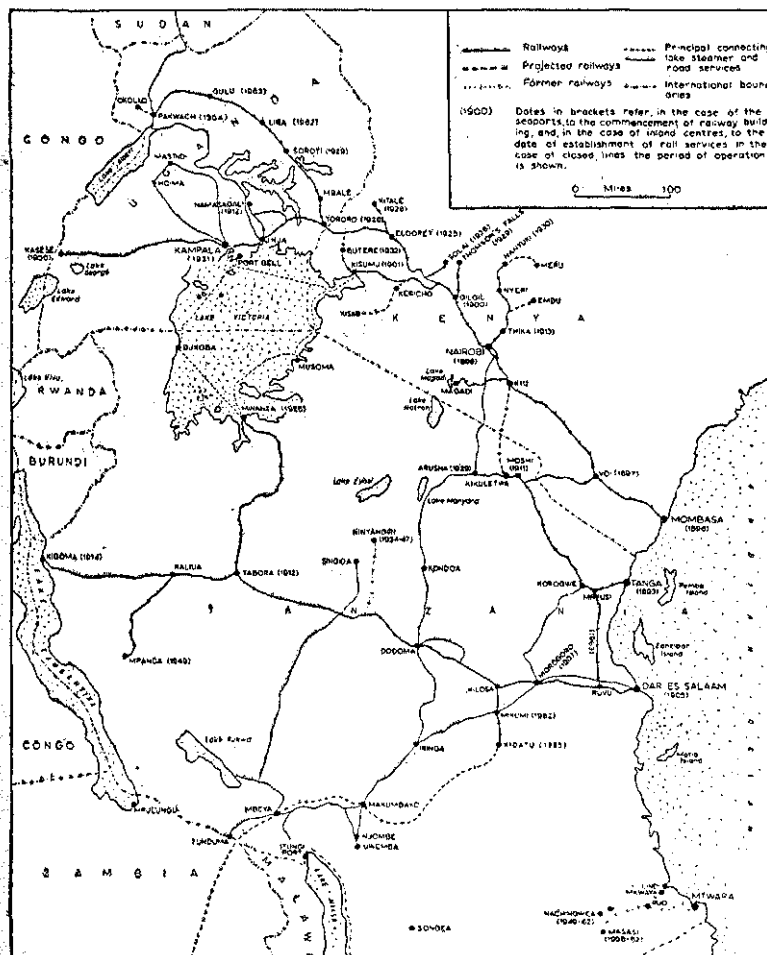


Figure 2. The pattern of surface transport services in East Africa

(c) Patterns of economic development in the interior. The relationship between areas of comparatively advanced economic

development, major lines of rail communication and ocean terminals is obviously very close in East Africa. It must be remembered however that we do not have here a case of areas of marked potential wealth experiencing development and finding convenient routes to suitable outlets at the coast. The seaports of East Africa have, it is true, grown rapidly in response to the expansion of the economies of the various countries, but the sequence of events has rather been in the reverse direction. Port sites were selected, within good natural harbours; railways were built inland, their length and direction governed largely by political and not by economic considerations; and the areas thus served by adequate communications have in certain cases, where other factors are favourable, been able to reach quite a high standard of economic development. Southern Uganda and the highlands of Kenya and northern Tanzania are cases in point where development in a favourable area has been made possible by rail communications with port outlets. Once the basic pattern of port, railway and potential development area was established, such areas have tended to develop rapidly in proportion to their resources as compared to other areas. The southern highlands of Tanzania, for example, are relatively undeveloped partly because no adequate lines of communication with ocean terminals are available. A proliferation of rail extensions in an economically advanced area does not necessarily promote commensurate development; but the provision of basic arteries for the movement of goods is of course a pre-requisite for any development. The functional pattern of the seaports of East Africa is closely related to the pattern of these arteries and to the patterns of economic activity in the areas which they serve.

(d) *The political framework.* The foundation of the modern seaports of East Africa is related closely to the political partition of the area between British and German spheres of influence towards the end of the nineteenth century. The mathematical line of demarcation which today forms, unaltered, the Kenya-Tanzania boundary, exerted a strong influence upon the direction of railway building from the coast, and for a time the various port-railway-hinterland systems of East Africa existed in parallel isolation. Uganda, of course, situated some 800 miles from the coast, is almost entirely dependent upon the railway link with Mombasa, through Kenya, for her external traffic, since the northward routeway via the Nile system has never been fully developed and the lake route via Mwanza to Dar es Salaam is inconvenient. The western frontiers of East Africa follow physio-



graphic divides, separating the higher and relatively more productive plateaulands from the lower areas of Zambia, Congo and Sudan; the hinterlands of Mombasa and Dar es Salaam extend, however, beyond these frontiers, traffic from Zambia and the Congo being significant though slight. Very little communication of any kind, however, exists across the boundaries with Ethiopia and Mozambique. Within the context of an East African Federation the real significance of the internal boundaries of East Africa would not be great, and would decrease further if East Africa were to become more closely welded as a political and economic unit. The fact that the railway system of East Africa became in 1963, for the first time, a physical as well as an administrative unit is an important step in this direction.

A problem of political geography of special relevance was that of the Kenya Coastal Strip.<sup>4</sup> Here stands the port of Mombasa, which provides services which are vital to all three mainland countries of East Africa. This added point to the necessity of finding a solution to the problem in the period immediately prior to Kenya's independence in 1963. The East African coastal strip was defined as the zone lying approximately within ten miles of the coast; in Kenya, separated from the interior by the semi-desert scrublands more effectively than from Asia by the ocean, the strip represents a minor East African parallel with the relationship of the Atlas lands to the Sahara and to Europe. For centuries the coastlands and offshore islands of East Africa were controlled by immigrant Arab traders, and there existed for long a firm geographical unity, physical and human, reflected in historical circumstances and population conditions. With the coming of the Europeans the Tanzania section of the strip was ceded by the Sultan of Zanzibar to Germany in 1890, and thus became part of Tanganyika in 1919; the Kenya section however, administered by Britain, remained technically under the authority of the Sultan until 1963. A commission of inquiry was set up in 1961 and reported that a majority of the inhabitants of the strip favoured union with Kenya.<sup>5</sup> The *de jure* Arab rule of the coastal strip was thus brought to a peaceful end, which was quickly followed early in 1964, a few weeks after Zanzibar's independence, by a revolution which ended the *de facto* Arab rule in the offshore islands. The safeguarding of the traffic of Mombasa was clearly one of the most vital aspects of these political developments; and it has been suggested that, in the event of an East African Federation being set up, Mombasa might provide a suitable federal capital, a situation that would invite comparison with that of Lagos in Nigeria.

**Site conditions**

The Pre-Cambrian Basement System which constitutes the essential foundation of the geology of much of Africa is widely exposed in eastern Kenya and Tanzania, but the immediate coastal area is fringed mainly by sediments of Tertiary and Quaternary age.<sup>6</sup> Successive marine transgressions along the coast were a notable feature of the Tertiary era in East Africa; Lower Tertiary deposits are infrequent, but the Miocene and Pliocene periods are represented by widespread sandstones, clays and limestones mainly of marine origin but sometimes originating in deltas or estuaries. In southern Tanzania, the sandstones known as the Mikindani beds reach a maximum thickness of 300 feet, and similar formations are found along many parts of the coast and on the offshore islands. During the Quaternary era positive and negative eustatic changes of sea-level continued along the coast, and the Pleistocene period is represented chiefly by raised coral reefs, by drowned river estuaries, and by sandstones, sands and dunes closely comparable to similar material of Tertiary age. Most of these sediments dip at a low angle towards the coast. Faults are not much in evidence in the coastal area, but a feature of some interest is a line of falls and rapids marking most of the smaller rivers a few miles inland from the coast and coinciding with a north-east to south-west fault running from the vicinity of Tanga to the Rovuma river.

The most interesting geomorphological feature on the coast of Kenya and Tanzania, and the one most significant from the standpoint of port development, is the existence of a series of drowned valleys or rias resulting from the Pleistocene changes in the relative sea-level to which reference is made above.<sup>7</sup> A number of tidal creeks occur on the East African coast; they vary considerably in size, their rock floors are considerably below present sea-level, and it is clear that they represent land valleys carved by river erosion and subsequently drowned. The sub-aerial erosion which produced these valleys probably took place subsequent to the formation of the Pleistocene raised coral reefs which form much of the existing coast-line. There is considerable similarity of form between Port Reitz and Port Tudor at Mombasa and the harbour of Dar es Salaam. These inlets are characterized by narrow, winding deep-water channels, partly blocked by submarine shelves of recent coral growth where they pass through the fringing reefs. During the Pleistocene period, when the sea-level was at one stage relatively much lower than at present, the creeks were formed as deep river valleys on the

seaward slope of the land, and their rapid erosion may have been accentuated by a contemporaneous pluvial epoch. Subsequently the advancing sea flooded the creeks and caused the gradual aggradation of the channels resulting in their present flat-bottomed form. Small examples of creeks of this nature are to be found along many parts of the East African coast; those mentioned above are merely the ones that have been commercially utilized, principally on account of their comparatively large size. The incidence and length of these drowned valleys is not, however, sufficiently pronounced to justify the classification of this coastline as a ria coastline comparable with that of, for example, south-western Ireland. In the Dar es Salaam area, associated features noted by Threlfall<sup>8</sup> include a series of low-lying steps, which appear to be raised beaches and old cliff lines and seem to owe their origin to pauses in the retreat of sea-level during the later Pleistocene period. The maximum elevation of the 'raised' coral reefs associated with this lowering of the sea-level is given by Sikes for various localities as follows: Malindi, 40 feet, Mombasa, 80 feet, Dar es Salaam, 50 feet, Lindi, 130 feet.<sup>9</sup> In general, therefore, the present detail of the coastline of East Africa has been brought about by discontinuous alterations of ocean level during Pleistocene and more recent times, alterations which appear to be still in progress.<sup>10</sup> A further feature of interest is that until late Pleistocene times the island of Zanzibar was a promontory joined to the mainland by a coral-fringed sandbank, whereas Pemba was severed from the mainland by faulting in Miocene times; this fact is reflected in the differences between the living fauna of Pemba on the one hand and of Zanzibar and the mainland on the other.

(a) *The site of Mombasa.* The immediate environs of Mombasa provide ample evidence in detail of the submergence to which reference is made above. The area now occupied by the open waters of Port Reitz and Port Tudor represents the drowned mouths of the rivers Kombeni, Cha Simba and Mwachi, and the present deep channel of Kilindini Harbour marks the line of the outlet to the sea of a former major river. A somewhat complex ria thus forms the most fundamental aspect of the site of Mombasa (Fig. 3). The widespread development of coral offshore is subsequent to the formation of the major creeks; silt carried in the waters of the numerous streams entering Mombasa and Kilindini Harbours has prevented coral growth across the entrance (the coral polyp can survive only in clear water at a temperature of at least 70°F.), and the break between the Leven

and Andromache reefs which flank the harbour entrance is vital for the navigation of ships to and from the port.

Mombasa Island, on which the town and most of the port

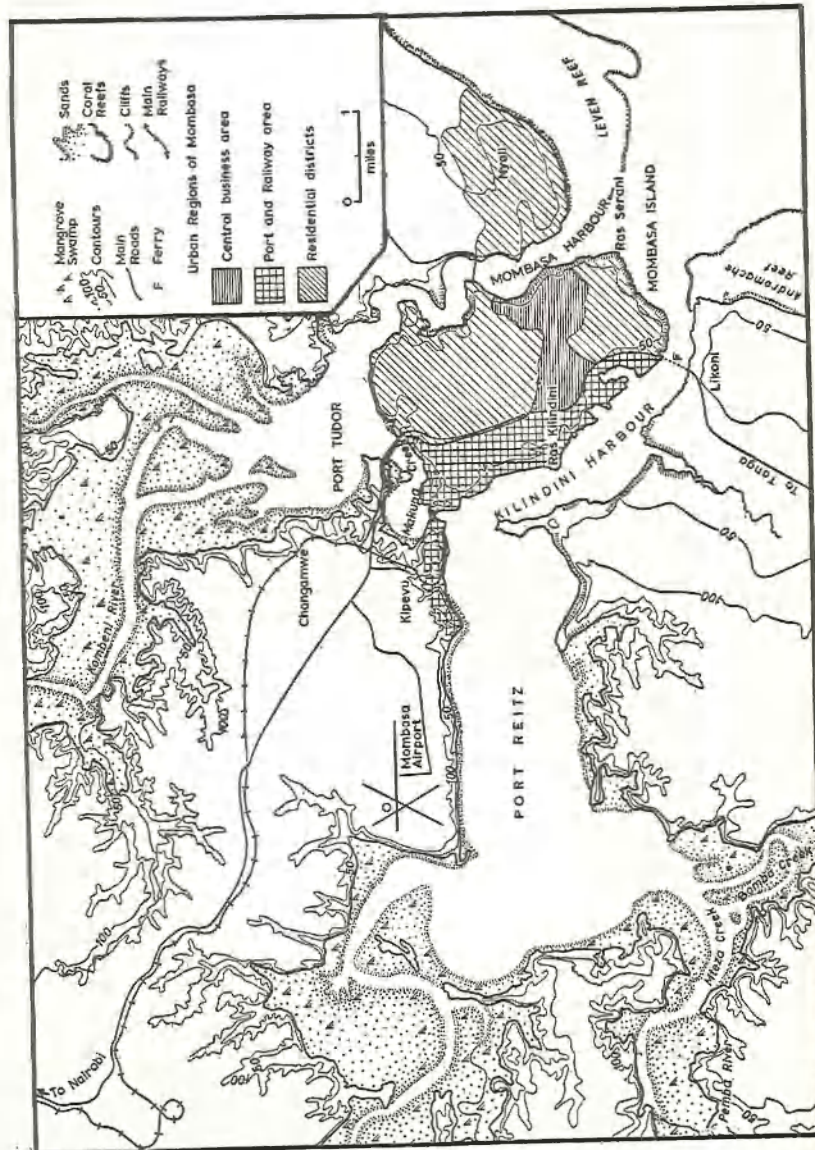


Figure 3. The site of Mombasa

Adapted from Kenya 1:50,000 maps, series SKII (Y731), sheets 198/III, 201/1.

facilities are sited, lies between Mombasa and Kilindini harbours and is separated from the mainland on the northern and north-western sides by Port Tudor and Makupa Creek. The southern two-thirds of the island, and the corresponding mainland areas on either side, are composed of coral reef and coral breccia, thicknesses of 80 feet being exposed above low water level<sup>11</sup>. Pleistocene beds known as the Kilindini Sands underlie the coral and form the remainder of the island. Shales and limestones, through which the Mwachi river cut deeply in the past, are present on the adjacent mainland. Borings near the head of Port Reitz have shown that the rock floor is 70-80 feet below low water level. Raised coral reefs of early Pleistocene age are horizontally bedded and similar in type on either side of the various creeks, and appear therefore to have been formerly more continuous and to ante-date the river erosion that produced the harbours.

Each of the two major arms of the ria system has been developed for commercial purposes, though in entirely different ways. The fact that Mombasa has been a seaport of significance in both medieval and modern times is largely attributable to her possession of not one harbour but two, contrasted in area, depth and capacity, a condition of site which has enabled the port to adapt itself successfully to functional and navigational changes. Mombasa Harbour, generally known as the Old Harbour, lies on the eastern side of the island between Ras Serani and Nyali Bridge. Overlooked by Fort Jesus and the older parts of Mombasa town, this small harbour provided excellent shelter for early sailing craft; but neither the entrance channel, which involves a rock bar, nor the harbour itself is sufficiently wide or deep for modern vessels. Due to physical constriction Mombasa Harbour retains the form and functions it acquired in the later Middle Ages. It is still used by the traditional dhows, which come in decreasing numbers each year on the north-east monsoon; but port facilities are almost non-existent and there has, naturally, been no attempt to cater for modern ocean-going vessels. If this small creek were all that Mombasa had as a harbour, her development as a modern seaport would have been severely limited.

Kilindini Harbour, on the south-western side of the island, is much wider and deeper than Mombasa Harbour, and is clearly much better fitted from the standpoint of physical geography to become the focus of modern shipping at Mombasa. The entrance from the sea, which of course also leads to Mombasa Harbour, is a channel some 300 yards wide at its narrowest point between

the 5-fathom lines, and is flanked by coral reefs on either side.<sup>12</sup> The depth of the channel varies considerably: the maximum depth is about 25 fathoms, and for some years the minimum has been maintained at  $5\frac{1}{2}$  fathoms; this permitted the entry of vessels of up to 45,000 tons and 800 feet in length. Recently, however, the building of an oil refinery has necessitated the deepening of the entrance channel to a minimum depth of 13 fathoms to allow the entry of large tankers of up to 65,000 tons. The tidal range in the harbour varies from 3 feet to 13 feet during the year, but does not interfere with shipping movements. A major advantage of Kilindini Harbour is that deep water is available close inshore: over 5,500 feet of quay space are available to vessels of up to 31-foot draught. A significant disadvantage of the harbour is that the entrance channel, which is a dog-leg in shape, is wide enough to permit the passage of only one vessel at a time; since it is rarely possible for vessels to wait outside the harbour entrance, especially during the monsoon seasons, considerable congestion sometimes results in the harbour, and very great care has to be taken by vessels leaving and entering since the lying-off space for vessels awaiting a berth is no more than adequate for current shipping manoeuvres.

(b) *The site of Tanga.* The port and town of Tanga are developed on the southern shore of Tanga Bay, a considerable indentation along a stretch of coast otherwise characterized by mangrove swamps and by muddy or sandy estuarine flats (Fig. 4). The bay, roughly circular in shape, represents the drowned mouths of the rivers Sigi and Mkulumuzi; these small streams merge into the open waters of the bay through a maze of mangrove swamps fringing the western shores. The harbour is sheltered from the south-east monsoon which blows in strongly, setting up a sea; outer reefs, however, protect the harbour from a heavy swell. Toten Island provides further protection for the inner harbour. The town of Tanga stands on a coral platform, a further example of a raised beach, in this case some 50 feet above low water level. The port facilities are grouped on a small area of land, partly of artificial construction, at the base of the 50-foot cliff.

Ships approaching the harbour must pass through the ship channel, a gap in the outer reefs about six miles from Ras Kazone, and the inner harbour is entered through a channel between the reefs lying off Ras Kazone and off Toten Island; the width of this channel between the 3-fathom lines is 1,700 feet. The tidal stream in the harbour is virtually negligible, and ship-

ping movements are limited only by the depth of water available at the various berths. Depth of water is the chief physical ob-

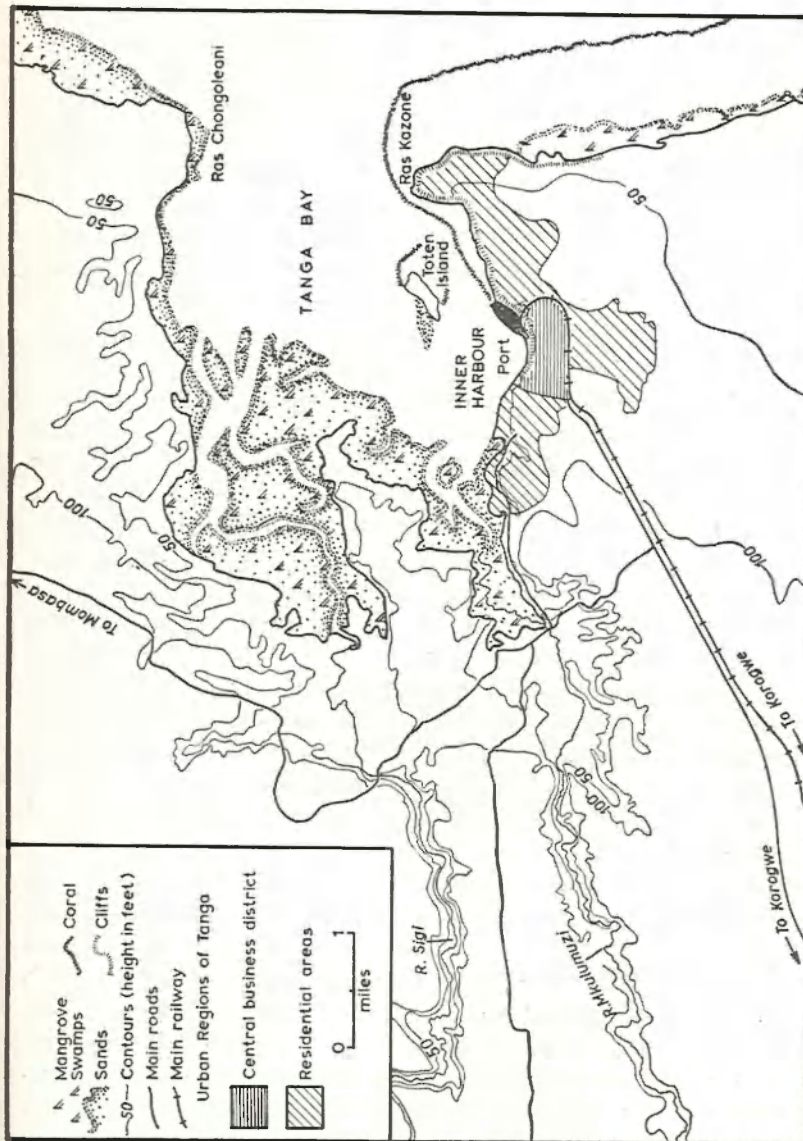


Figure 4. The site of Tanga

Adapted from Tanganyika 1:50,000 map, series Y742 (DOS 422), sheet 130/EI.

stacle restricting the development of Tanga as a seaport; within the inner harbour, about one quarter of a square mile is available with a depth of rather more than three fathoms, and a further quarter of a square mile with less than three fathoms, suitable only for smaller craft. With these restrictions, Tanga has been able to develop only as a lighterage port. There are five anchorages for ocean-going vessels within the inner harbour, where the maximum length of vessels that can be accommodated varies between 500 and 600 feet, and the maximum draught between 19 and 25 feet. There is also an anchorage situated to the north north-east of Toten Island, suitable for vessels of up to 30-foot draught, but during the north-east monsoon weather conditions frequently make this berth unsuitable for working cargo. Several other anchorages are available for small craft. Cargo is transported between ships at anchor in these berths and the quays by lighters, a procedure which involves the double handling of goods and which is obviously unsatisfactory.

(c) *The site of Dar es Salaam.* Many of the physical features noted in the case of Mombasa are repeated at Dar es Salaam (Fig. 5). The harbour, which is a tidal basin with a deep water area of 237 acres, and the Southern Creek, where four vessels may swing at anchor in deep water, together represent a further example of the drowned river valley feature noted elsewhere. Three small rivers drain into the head of Southern Creek, which is choked with mangrove swamp.

From the navigational standpoint, Dar es Salaam is in some ways the most difficult of the East African ocean terminals, for in spite of its deep water facilities the harbour itself is very small and the entrance is constricted. The entrance channel, at the north-eastern end of the basin, is narrow and angular, and is obstructed by coral growth; the minimum width between the 4-fathom lines is 420 feet, and the minimum depth is 19 feet at L.W.O.S.T. The tidal range is 12 feet and the maximum current in the channel is  $3\frac{1}{2}$  knots at the spring tides. Shipping movements in and out of the basin are subject to restrictions depending on draught and the state of the tide, especially the spring tides. Normally vessels of up to 500 feet in length (550 feet in the case of twin-screw vessels) are permitted to enter the harbour, and the maximum permissible draughts at various tides vary between 19 and 30 feet.

However, few ships entering the harbour exceed 25-foot draught. Ship manoeuvres, for which pilotage is compulsory at all times, are limited as far as possible to the hours of daylight,



and night pilotage is only used for vessels not exceeding 450 feet in length. A major obstacle to free navigation in and out of the harbour is that vessels must stem the tide when entering or

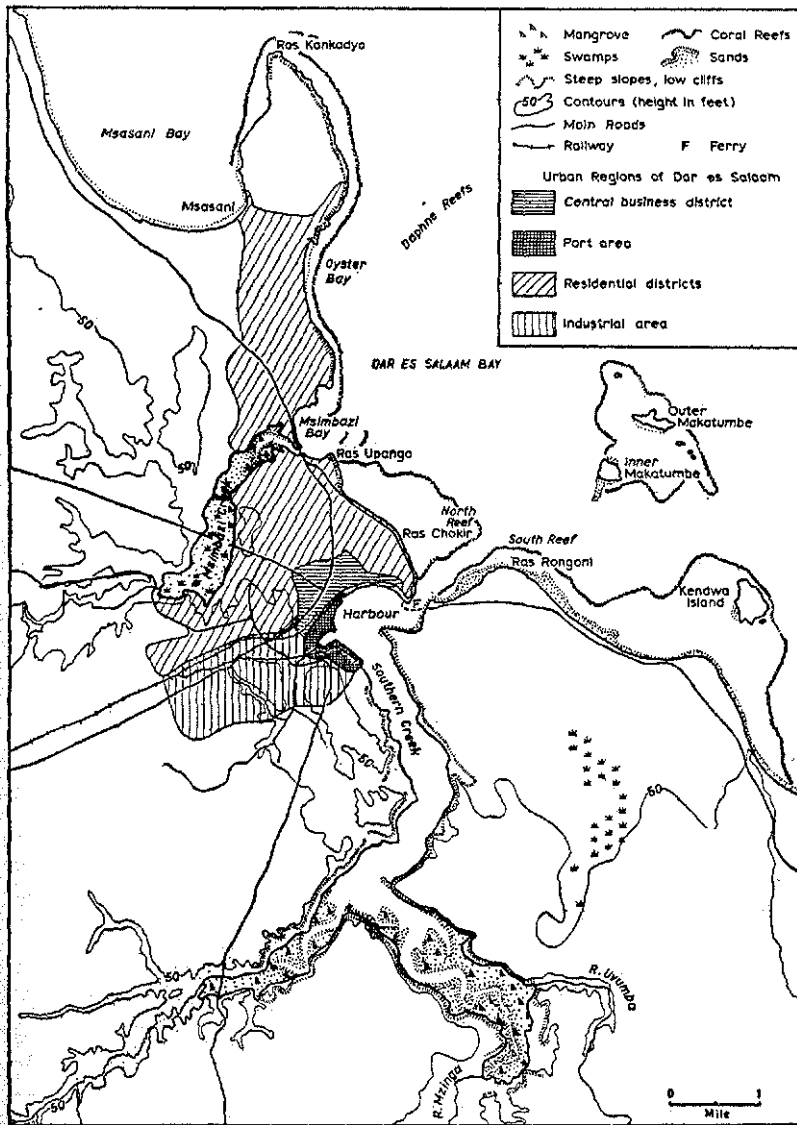


Figure 5. The site of Dar es Salaam

Adapted from Tanganyika 1:50,000 maps, series Y742 (DOS 422), sheets 186/1, 186/IV.

leaving the harbour during the spring tides.

The picturesque inner harbour, often incorrectly described as a lagoon, is well concealed from the sea; Captain Owen, when making his hydrographic survey of the East African coast for the Admiralty in 1824-6, completely failed to realize its existence.<sup>13</sup> In addition to three deep water berths, partly constructed on reclaimed land, and four lighterage berths, eight further anchorages are provided within the harbour. A small creek in the south-western corner of the main basin, known as Kurasini Creek, is about 1,000 feet long and has a maximum width of 350 feet between the one-fathom lines at its entrance. It is obviously too shallow to be of much use. More important is the Southern Creek, the main arm of the ria, which is navigable for about  $1\frac{1}{2}$  miles for ships drawing up to 30 feet of water. The average width of the creek between the 4-fathom lines is 1,000 feet. Although deep water close inshore is lacking, Southern Creek serves as an extension to the main basin, and a maximum of six vessels may lie at anchor there.

(d) *The site of Mtwara.* Mtwara Harbour is the larger of two almost landlocked stretches of water in the inner reaches of Mikindani Bay, a considerable indentation on the coast of southern Tanzania near the Mozambique border (Fig. 6). Mtwara and Mikindani Harbours, together with Mikindani Bay of which they form a part, constitute an extensive ria system comparable to those noted at the more northerly seaports of East Africa. However, whereas Mikindani Harbour is small and relatively shallow, Mtwara Harbour provides a spacious area of some  $4\frac{1}{2}$  square miles of deep and well-sheltered water, and it is on this fact that its modern development as a seaport is based. Within the harbour there is ample room for ship manoeuvres and numerous anchorages are available in depths up to 18 fathoms. A limiting factor however is the entrance to the harbour, which is a dog-leg not unlike that at Dar es Salaam and involving an awkward turn. Vessels entering Mtwara Harbour from Mikindani Bay must negotiate a narrow channel, some 13 fathoms deep at its shallowest point, between Mwamba Ribunda and Mwamba Shagani, two stretches of low coral reef exposed only at low tide. Abreast a low sandspit known as Msemo (or Masemo) Spit, the entrance channel is only  $1\frac{1}{2}$  cables wide, and it is at this point that a  $90^\circ$  turn is involved. A deep water quay is situated on the south side of the harbour, developed partly on artificial ground, and the minimum depth at the quayside is 32 feet.

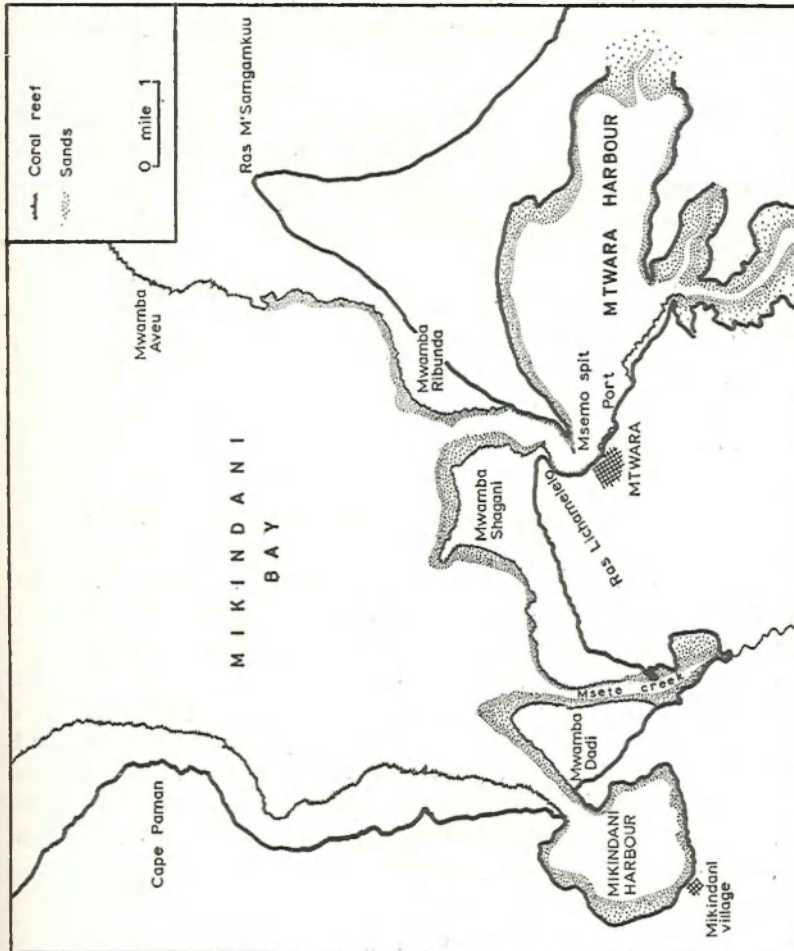


Figure 6. The site of Mtwarra

Adapted from Admiralty Chart No. 684.

**Summary**

Table 1 indicates certain particular and relative defects of locational conditions. It is at once obvious that Mombasa is unique among the seaports of East Africa, having no major defect of situation or site. Although the water situation of all East African seaports is broadly the same and is reasonably satisfactory, Mombasa clearly possesses the most advantageous water site and the best land situation in terms of an extensive and comparatively well-developed hinterland. These facts clearly go

TABLE I

PARTICULAR AND RELATIVE DEFECTS IN THE LOCATION OF EACH EAST AFRICAN SEAPORT

	<i>Water Situation</i>	<i>Water site</i>	<i>Land situation</i>	<i>Land site</i>
MOMBASA .. ..				
TANGA .. .. .		X	X	
DAR ES SALAAM ..		X		
MTWARA .. ..			X	

*(X indicates defect).*

some way towards explaining the predominance of Mombasa as East Africa's principal seaport. Dar es Salaam, in comparison, does not share the same advantages, having a comparatively restricted water site and a less advanced (although still very extensive) hinterland. The shallowness of the water within the harbour at Tanga, and the disadvantageous land situation between the two larger ports (so that only minimal hinterland growth has been possible) help to explain the comparatively low level of development at that port. The only major defect in the location of Mtwara, in contrast, is in the land situation: with little development in the hinterland, and with no railway, Mtwara still stands today as a port of potential rather than actual development.

*Notes and References*

1. A. E. Smailes, *The geography of towns* (London: Hutchinson, 1953), p. 57.
2. D. Hilling, 'Tema, the geography of a new port', *Geography* 51, 1966, 111-125.
3. There is a contrast also, in a different sense, with certain other African countries, e.g. South Africa and Rhodesia.
4. A more detailed account of this problem than would be appropriate here may be found in A. Melamid, 'The Kenya coastal strip', *Geogr. rev.*, 53, 1963, 457-59.
5. J. W. Robertson, *The Kenya coastal strip: report of the commissioner* (Cmd. 1585, London: H.M.S.O., 1961).
6. E. P. Saggerson, 'The geology of East Africa', *The natural resources of East Africa*, ed. E. W. Russell (Nairobi: E. Afr. Lit. Bureau, 1962), pp. 52-66.

7. A detailed account of this phenomenon is given by H. L. Sikes, 'The drowned valleys on the coast of Kenya', *Journ. E. Afr. and Uganda nat. hist. soc.*, 38, 1930, 1-9. The feature was first observed by H. B. Maufe, *Geology of the East Africa Protectorate* (London Col. Rep. Misc. No. 45, Cd. 3828, 1908).
8. H. R. Threlfall, 'Some physical features of the Dar es Salaam district', *Tang. notes & records*, 29, 1950, 68-72.
9. Sikes, *op. cit.*, p. 2.
10. At Kilwa the floor of a mosque, which cannot be more than a few centuries old, is now slightly below sea-level. See G. M. Stockley, 'Geological notes on the coastal region of Tanganyika', *Tang. notes & records*, 3, 1937, 82-86.
11. Geological Survey of Kenya, *Geology of the Mombasa-Kwale area*, Report no. 24 (Degree sheet 69), by P. V. Caswell, (Nairobi: Govt. Printer, 1953).
12. Navigational details obtained from *Africa pilot*, Vol. III, *The southern and eastern coasts of Africa from Table Bay to Ras Hafun* (London: Hydrographic Dept., Admiralty, 11th ed., 1954), and from information supplied by the Chief Ports Manager, E.A.R.&H.
13. Capt. Thomas Boteler, *Narrative of a voyage of discovery to Africa and Arabia performed in His Majesty's ships Leven and Barracouta from 1821 to 1826* (2 vols.; London, 1835).

### 3

## THE MODERN DEVELOPMENT OF THE SEAPORTS OF EAST AFRICA

### Introduction

The growth of port activity on the East African coast may be divided into two distinct periods, the first stretching from the first millennium A.D. to the mid-nineteenth century and the second from the later nineteenth century to the present day. Between these two periods, so unequal in length and so different in character, a transitional epoch occurred during which the external trading activity of East Africa focused upon the port of Zanzibar. This chapter is devoted to an analysis of the second, most recent, period of port development. The level of development of the present East African port group as a whole should, however, be viewed as a reflection of the varying pattern of relationships with the maritime foreland and with the interior hinterland; for on the same physical foundations different generations of men have built up quite different hierarchies of ports. Today the East African coastlands constitute the maritime façade of a developing region of considerable economic potential, and form a vital outward-looking link with the rest of the world. This orientation is a product of the last hundred and fifty years, for during all the long preceding centuries the coastlands of East Africa were for trading purposes effectively nothing more than part of the western shore of the Indian Ocean.<sup>1</sup> The new orientation of the coastlands in the nineteenth century was a result of several factors: the movement of African traders to the coast, the inland trading activities of the Arabs (from about 1825), European exploration (from 1856), and European administration (from 1885). The rise and present traffic of the modern seaports of East Africa is an indication of the extent to which the twentieth century economic development of the area has been successful.

### The concept of 'Anyport'

In his study of the principal seaports of the United Kingdom J. H. Bird introduced the concept of a hypothetical *Anyport* as a pattern and standard against which to compare the develop-

ment of actual individual ports.<sup>2</sup> The method is useful in relation to the growth of the seaports of East Africa since each historical stage in the development of *Anyport* involves a change in the physical layout of the port, and thus the way in which the present pattern of port facilities has evolved may clearly be seen. Further, the application of the concept to a group of ports such as that existing in East Africa is helpful in assessing the comparative progress and patterns of development of the various individual components of the group. The development of *Anyport* begins "when the two-way exchange between land and water transport is regularly performed at a place, even if there are no port installations of any kind upon the shore".<sup>3</sup> Factors affecting the choice of site have already been discussed in Chapter II, but obviously the place selected must be at the point of intersection of the coastline and at least one serviceable route running inland. Since land and water transport systems can never be precisely integrated, the provision of storage and handling facilities is necessary; their construction, and that of a quay or jetty designed to steepen the gradient between land and water, marks the beginning of the first or *primitive* era of the development of *Anyport* (Table 2). Pressure on space, and the increasing size and number of vessels, soon demand an expansion from the port nucleus, which sometimes takes the form of a new beginning on a slightly different site. These events mark the beginning of the second era of development, that of *marginal quay extension*, which involves lineal extension beyond the confines of the primitive nucleus. Distance from the nucleus, and physical obstacles, set a limit to this process and introduce the third era of *marginal quay elaboration* which is characterized by the construction of jetties extended into the water and of quays developed with the help of land excavations, known respectively as water-encroaching and land-encroaching sites. Pressure on water space initiates the next era, that of *dock elaboration*, in which the first docks are built, equipped with locks, to enclose a number of ships and to minimize the effects of the tides on the activity of the port. Such docks are also equipped with warehouses and often have elaborate outlines, since their designers wished to obtain the maximum length of quayage in relation to the available water area. The complex patterns of these docks, characteristic of the nineteenth century in Britain, has meant that in more modern times, as the size of ships has rapidly increased, their usefulness has become limited, and the cost of making extensive alterations is prohibitive. Thus a new period of lineal

development became necessary; this is termed the era of *simple lineal quayage*, and has enabled *Anyport* to berth the largest ships efficiently and with flexibility. However, *specialized quayage* is required by many modern vessels, for example by oil

TABLE 2  
SUMMARY OF THE GENERAL THEME OF THE DEVELOPMENT OF A MAJOR BRITISH PORT

<i>Era</i>	<i>Terminated by the epoch of . . . .</i>
I <i>Primitive</i>	the overflowing of the port function from the primitive nucleus of the port, or the change in location of the dominant port function.
II <i>Marginal quay extension</i>	the change from a simple continuous line of quays.
III <i>Marginal quay elaboration</i>	the opening of a dock or the expansion of the harbour.
IV <i>Dock elaboration</i>	the opening of a dock with <i>simple lineal quayage</i> .
V <i>Simple lineal quayage</i>	the provision of oil berths in deep water.
VI <i>Specialized quayage</i>	the occupation of all waterside sites between the port nucleus and the open sea.

Source: J. H. Bird, *The major seaports of the United Kingdom*, (London: Hutchinson, 1963), p. 34.

tankers and by bulk ore- and grain-carriers, and the development of facilities to meet these needs marks the beginning of the sixth era of *Anyport's* development. Oil tankers, in particular, are suited to specialized treatment. Large tankers cannot easily negotiate many harbours; the unloading of oil is a simple and rapid process; and for security reasons it is preferable that oil installations should be sited away from other port facilities, often, in fact, in deep water. In the modern era *specialized quayage* is often carried a stage further: a series of berths serves public utilities, gas works and generating stations; and certain berths may specialize in handling certain types of cargo, a certain class of vessel, or ships of a certain company. In this process of specialization elements of former eras are adapted to modern needs. As trade increases and ship design changes, and as one era of development moves into another, the facilities of earlier eras become adapted to serve later ones, often in a secondary capacity. This process of adaptation poses many problems, especially at large ports, but facilities representative of various eras of development may often be seen in present-day port lay-



outs. The usefulness of the *Anyport* concept is thus not only that it draws attention to different eras of port development but also that, bearing the concept in mind, attention is more readily drawn to any unusual or unique features in the growth of an individual port.

#### **The application of the concept of 'Anyport' to the seaports of East Africa**

This method of analysing the development of *Any (British) port* is not applicable in every detail in the case of the seaports of East Africa. There are several important reasons for this, which draw attention to significant contrasts between British and East African seaports. Firstly, there is the fact that whereas many British seaports have been active since medieval times, the seaports of East Africa are very largely twentieth century developments, at least as far as material port facilities are concerned, and they have thus had a much shorter period of time in which to develop. Secondly, the pattern of development analysed under the scheme for *Any (British) port* is closely related to the characteristic siting of major British seaports on tidal estuaries; since all the major mainland seaports of East Africa are sited on drowned estuaries, since most have deep-water sites, and since the tidal range is relatively small, physical influences upon port development have been somewhat different. The creation of enclosed docks has not been necessary; the era of *dock elaboration*, a result of estuarine sites and of the peculiar tidal régime around the British coasts, is thus not represented in East Africa. Thirdly, in more general terms, there is the fact that Britain is a small area of highly concentrated, advanced economic activity, whereas East Africa is a much larger area still in a relatively early stage of economic development. Britain is thus served by a large number of complex ports with overlapping hinterlands; the sixth era of *specialized quayage* has reached an advanced stage and traffic flow has reached a high level. In East Africa, on the other hand, a small number of ports with a relatively small traffic flow and with hinterlands that are to a large extent mutually exclusive, exhibits a much simpler pattern of development and activity. However, although the system devised for *Any (British) port* cannot apply in detail to East Africa, the concept is a valuable one and can be worked out in a different form using a simpler system of stages of development. In working out such a system for *Any (East African) seaport*, an obvious contrast is at once apparent in relation to the stages reached and the stages

represented at various individual ports. Some East African ports have not progressed beyond the earlier stages of development; only in two cases are all the eras represented; and in one instance an advanced stage is represented yet an earlier one is completely by-passed.

Table 3 summarizes the five eras of port development that may be recognised at the major seaports of East Africa. In tracing the growth of the modern seaports of the area, it is necessary to go back to the end of the nineteenth century to the era of *dhow traffic*. This era, which encompasses virtually the whole of the period from early medieval times to the end of the nineteenth century, and which involved the development of different hierarchies of ports at different periods, did not necessitate the construction of any substantial port facilities and was thus an era in which flexibility of port sites was an important keynote. Towards the end of the nineteenth century, however, historical factors made necessary a crystallization of the pattern of port development into a more permanent system which became the basis of the present-day hierarchy. Around the turn of the century there was a geographical shift from a series of harbours or open roadsteads used by the dhows to the series of harbours constituting the present major East African seaports; this movement was made necessary chiefly by the increasing size and increasing manoeuvrability of ships, and affords an interesting

TABLE 3  
SUMMARY OF THE GENERAL THEME OF THE DEVELOPMENT OF A MAJOR EAST AFRICAN SEAPORT

<i>Era</i>	<i>Terminated by the epoch of . . .</i>
I <i>Dhow traffic</i>	the construction of the first port facilities on the modern harbour site.
II <i>Primitive</i>	the construction of the first lighterage quays.
III <i>Marginal quay extension</i>	the opening of the first deep-water berths.
IV <i>Simple lineal quayage</i>	the provision of oil berths in deep water.
V <i>Specialized quayage</i>	the occupation of all deep-water sites within the confines of the harbour.

illustration of the way in which the design of ships, rather than the conditions of harbours, has always been the pacemaker in sea transport developments.

The period of *dhow traffic* is thus concluded, and the *primitive* era introduced, by the construction of the first port facilities on the site of the nucleus of the modern port. In most cases this development is associated with the change from sail to steam propulsion, and with the building of railways inland, and may thus be precisely dated. The concentration of traffic at particular points by the simultaneous development of land transport and port facilities rapidly induced an increase in traffic in the early colonial period. Thus the *primitive* era was short-lived and was soon superseded by the era of *marginal quay extension*. The inauguration of this era, marked by the opening of the first properly constructed lighterage wharves (as opposed to the somewhat makeshift jetties of the *primitive* era), may again be precisely dated; moreover, in all cases where the era is represented, its beginning in each port is almost simultaneous and its duration is considerable (Table 4).

The two eras which succeed that of *marginal quay extension* in the development of *Any (British) port* — the eras of *marginal quay elaboration* and *dock elaboration* — are not represented in the growth of *Any (East African) seaport*. The small size of the ports and their rate of growth in relation to their sites meant that *marginal quay extension* could continue without difficulty, no part of the port being too far away from the original nucleus or from the township area with which it was associated. Similarly, the necessity for *dock elaboration* did not arise, since

TABLE 4  
COMPARISON OF DATES OF THE TERMINATION OF PORT  
DEVELOPMENT ERAS AT MAJOR EAST AFRICAN SEAPORTS

	<i>Mombasa</i>	<i>Dar es Salaam</i>	<i>Tanga</i>	<i>Mtwara</i>
End of <i>dhow traffic</i> era ..	1896	1900	1892	1920
End of <i>primitive</i> era ..	1907	1907	1914	1954
End of <i>marginal quay extension</i> era .. ..	1926	1956	—	—
End of <i>simple lineal quayage</i> era .. ..	1963	1966	—	—

the tidal range in the deep-water harbours of East Africa is never sufficiently great to affect shipping movements seriously. Enclosed docks thus do not exist, and the slipways are adequate

for small-scale ship repairs. As a result of the availability of plentiful shipping space and of deep water at all stages of the tide, *Any (East African) seaport* thus moved on directly to the era of *simple lineal quayage*, introduced by the construction of the first deep-water berths in response to increasing ship size and increasing traffic. In this era the extent of development varies considerably between the individual seaports. Tanga, for example, has not yet entered this era and is not now likely to do so; Mombasa, however, reached this stage of development almost thirty years earlier than Dar es Salaam or Mtwara, the latter port moving directly into the era of *simple lineal quayage* from the *primitive* era, due to somewhat artificial circumstances of which details are given below.

Only at the present time is *Any (East African) seaport* introducing major elements of the fifth and final era of *specialized quayage*. The term 'major' is used because specialized equipment for the export of Magadi soda has in fact been available at Mombasa since 1913. The introduction of facilities for the reception of crude oil in association with the construction of oil refineries is however a dominant feature of the period 1963-66; facilities for the unloading of refined oil products have of course been available for many years, but do not fall precisely within the category of *specialized quayage*.

Thus at *Any (East African) seaport* the pre-twentieth century *dhow traffic* era has been succeeded by a variety of eras which, seen in an historical context, have followed one another with considerable rapidity. The *primitive* era is seen essentially as a brief transition, a mere beginning on the modern port site, leading to the two most significant periods in which lighterage quays and deep-water quays were respectively developed. For the sake of easy comparison with Bird's analysis of the eras of development of *Any (British) port* the terms *marginal quay extension* and *simple lineal quayage* have been retained, but the distinction between the two forms of lineal development is fundamentally that of the presence or absence of deep-water facilities, which in East Africa is a reflection of physical site conditions as well as of traffic levels. In East African circumstances a deep-water berth may be defined as a minimum of 500 feet of quay in one uninterrupted line with a minimum depth of 30 feet alongside. The analysis of the eras of development of *Any (East African) seaport* applies, of course, principally to the larger seaports of Mombasa and Dar es Salaam, at which all the (East African) eras are represented; elsewhere certain eras have either been

omitted completely, or have not yet been reached. Part of the usefulness of the analysis is thus that it serves to highlight the significant contrasts between the various seaports of East Africa. A further point that requires emphasis is that the termination of an era by the inauguration of its successor does not mean that the earlier era came to a sudden end or that the constructions belonging to that era ceased to be of service. *Any (East African) seaport* is still a dhow port — although it seems that vestiges of this period may soon vanish altogether; and although few elements representative of the brief *primitive* era now remain, the facilities constructed during the eras of *marginal quay extension* and *simple lineal quayage* constitute the basis of the present range of equipment. Further development of *simple lineal quayage* is in fact continuing during the present era of *specialized quayage*.

#### The modern growth of Mombasa

When Mr. (later Sir) George Whitehouse stepped ashore at Mombasa in 1895 to direct the building of the railway from the Indian Ocean to Victoria Nyanza one of his most immediate problems was the provision of some kind of facilities for the unloading of the steamers bringing railway materials from overseas. Whitehouse established his base on the island, and bought 372 acres of land near Kilindini Harbour. Cargoes from the earliest steamers to use the harbour were landed on the beach: "the lighters were brought as near high water mark as they would float, then they were allowed to ground and they were off-loaded between half-flood and half-ebb tides".<sup>4</sup> In 1896 a jetty was built on the Mbaraki side of Ras Kilindini — an event which marks the transition of the port of Mombasa from the era of *dhow traffic* into the *primitive* era. The jetty, which was partly embanked and partly of timber piling, "was built so that fully loaded lighters could lie alongside at any tide and be off-loaded by steam cranes direct into wagons".<sup>5</sup> A few sheds for perishable stores were also built. In 1898-99 an experienced engineer, Sir Guildford Molesworth, visited East Africa and reported on the progress of the railway and harbour developments. With regard to Kilindini, the development of which he strongly recommended in preference to the Old Harbour of Mombasa, he commented that "the port possesses great facilities for development as well as sites for warehouses and wharves of almost indefinite extension".<sup>6</sup> Molesworth's views were strongly endorsed by another inspector, Colonel T. Gracey, who wrote in 1901 that "the most urgent

TABLE 5

ERAS AND EPOCHS IN THE DEVELOPMENT OF THE PORT OF MOMBASA

<i>Era</i>	<i>Terminated by . . .</i>	<i>Present-day symbols</i>
I <i>Dhow traffic:</i> largely confined to Mombasa Harbour	Construction of first port facilities at Kilindini: Mbaraki jetty, 1896.	Continuing (though slight) dhow traffic in Mombasa Harbour; landing place.
II <i>Primitive:</i> Mbaraki jetty	Construction of first lighterage quay, 1907.	Slipways south of Ras Kilindini.
III <i>Marginal quay extension:</i> lighterage quays	Opening of first deep- water berths, 1926.	Lighterage quays south of Ras Kilindini.
IV <i>Simple lineal quayage:</i> deep- water berths.	Opening of Kipevu oil terminal, 1963.	Deep-Water berths nos. 1-5, 7-14.
V <i>Specialized quayage:</i> oil terminal facilities		Kipevu oil terminal (jetty and facilities).

necessity at Kilindini is a deep-water berth, along which large vessels can lie connected by rail with railway warehouses . . . The first thing necessary is the preparation of a comprehensive plan showing what will be the ultimate aim and object to be attained when traffic largely develops . . .”<sup>7</sup>

The *primitive* era came to an end with the construction of a lighterage wharf in 1907. The earlier wooden structures rotted away, and traffic continued to increase. The new wharf was 550 feet long, built in concrete, and represents the inauguration of the era of *marginal quay extension* at Mombasa. It was hoped that additional quays would be built to relieve the increasing congestion, but in fact all traffic was handled at this wharf until the first of the deep-water berths was opened almost twenty years later; apart from some temporary wartime constructions the only exception to this was a concrete pile wharf built in 1913 on the present site of berths 9 and 10 to handle exports of soda ash from Magadi — an early example of *specialized quayage*. The Acting Manager of the railways reported in 1912 that at Kilindini “the wharf and sheds have now been in full use sufficiently long to satisfy everyone concerned that the accommodation is totally inadequate to meet the rapidly increasing needs of the port. . . . Wharfage, provided with the necessary cranes and siding facilities (whether of the expensive deep-water sort, or a wharf capable of receiving only lighters) is urgently

wanted and until provided no one can rest satisfied".<sup>8</sup> The efficient working of the port was further handicapped by the very irregular arrival of steamers. At times the wharf and sheds lay idle, at other times they were overcrowded with goods and the number of lighters was inadequate. Complaints arising from damage and delay were frequent. The only remedy to the problem was the provision of facilities adequate in relation to the increasing traffic. In 1914 plans were finally approved for the building of a deep-water berth, and the British Parliament made available £700,000 for the purpose. The project was however abandoned on the outbreak of war in August of that year. During the war Kilindini harbour was taken over by the navy and closed to public traffic; most of the imports and exports to and from Uganda and the East Africa Protectorate (Kenya) had therefore to pass through the Old Harbour at Mombasa which was entirely inadequate for the purpose, even though lack of shipping space severely curtailed trade.

Mombasa's entry into the era of *simple lineal quayage* was thus postponed by the war and its aftermath until 1926. The urgent necessity for deep-water berths had become increasingly obvious as the railway system was extended and as European settlement and export crop production increased. Investigations at a site immediately north of Ras Kilindini were commenced in 1912 and resumed in 1920. Deeper water offshore, and a less strong tidal current, made this part of the coast of Mombasa Island more suitable for port development than the Mbaraki area. On 2 August, 1926 berths 1 and 2 were completed; they consisted of 1,100 feet of quayage, with 33 feet of water alongside, together with transit sheds and ancillary equipment. At the same time a comprehensive plan was drawn up for the extension of deep-water quayage north-westwards along the shore of the island, and a contract was placed immediately for the building of berths 3 and 4; these were completed in 1929 and represented an extension of 1,000 feet. A fifth deep-water berth was opened in 1931, at a cost of £550,000, at about the same time as a new lighterage wharf and the bulk oil jetty at Shimanzi. "Kilindini was now a well-equipped port, capable of handling simultaneously at the deep-water berths six of the largest ships plying on the East Coast of Africa, and an oil tanker at the Shimanzi jetty".<sup>9</sup>

No further major developments took place before the second world war. A significant test of the capacity of the harbour came in the early months of 1940, when as a result of the closure of the Red Sea all northbound British shipping in the Indian Ocean

was sent to Kilindini to await orders. The pilot service at Kilindini had to be expanded quickly, and a rapid survey was made of Port Reitz as a useful extra space for anchorage. Later, Mombasa became important as a naval base, and to improve the turnround facilities two new deep-water berths (numbered 7 and 8, with a total length of 1,218 feet) were built in 1942-44.<sup>10</sup> At one time during the war a total of 217 ships of all kinds were berthed or anchored in Kilindini Harbour.

During the immediate post-war period increases in traffic handled made necessary further development of port facilities, but unfortunately adequate finance was not available and congestion in the port was the inevitable result. However, work on two further deep-water berths (nos. 9 and 10) was begun in 1953; two years later berth no. 9 was completed, and in 1954 a new lighterage wharf with eight stub jetties was opened south of Ras Kilindini. No. 10 berth was not completed, however, until 1958, owing to an unfortunate setback in 1954 when the greater part of the construction work collapsed into the harbour as a result of subsidence, apparently related to a submarine geological fault.

The opening of no. 10 berth in 1958 completed the possible programme of port works on Mombasa Island since no suitable sites for the further development of deep-water quays remained unutilized. It was necessary therefore to direct attention to the nearby mainland at Kipevu, where further development of *simple lineal quayage* is still in progress. Here, on a site running in an east-west direction, connected to Mombasa Island by a road/rail causeway built in 1957, the Kipevu Project has involved the construction of four additional deep-water berths at a cost of over £4 millions. Two of the berths (nos. 11 and 12) were fully equipped and brought into service in 1961; the other two, making up a total length for the Kipevu berths of 2,400 feet, were not immediately utilized but were brought into service in 1967 in response to increasing traffic pressure.

A further development of great importance has been the building of an oil jetty at Kipevu to receive large tankers bringing crude oil supplies to a refinery established at Changamwe. This event marks Mombasa's entry into the fifth era of *specialized quayage*. An earlier site for a refinery at Likoni was abandoned in favour of the Changamwe site because the latter is near the main Mombasa-Nairobi road and railway routes, in a developing industrial zone, and within two miles of the tanker jetty site at Kipevu, to the west of the new deep-water berths. The



£15 million project involved, in addition to the building of the refinery itself, the construction of a tank farm on the foreshore at Port Reitz, adjacent to the oil jetty, and the dredging and deepening of the approach channel to Mombasa harbour to allow the entrance of supertankers. These operations were completed in the period 1961-63. The entrance channel to the harbour is dredged to 40 feet; and the jetty, 1,100 feet long with a depth alongside at L.W.O.S.T. of 47 feet, is capable of accommodating tankers up to 65,000 tons deadweight.<sup>11</sup>

#### The modern development of Tanga

Tanga was the first of the modern seaports of East Africa to be developed, but its disadvantageous situation and site conditions have seriously curtailed its progress. Situated between Mombasa and Dar es Salaam, both of which have better water sites, superior port facilities and more extensive rail connections inland, Tanga has been effectively prevented from developing as a major seaport serving a wide area of the East African hinterland. Rather, Tanga remains as a port of small, almost local importance, deriving the bulk of its traffic from the sisal-growing areas of north-eastern Tanzania.

Very little information is available on the earliest era of Tanga's development. The harbour was certainly used by dhow traffic, like most other creeks and inlets along the East African coast, from an early date. Mtang'ata and Tongoni, of some significance as seaports in earlier centuries, are located a few miles south of Tanga Bay; and in some senses the once-flourishing port of Pangani stands in the same relationship to modern Tanga as Mombasa Old Harbour to Kilindini or Bagamoyo to Dar es Salaam.

In 1891 the German Chancellor, von Caprivi, signed an agreement with the German East Africa Company which undertook to form a subsidiary company to construct and operate ports and railways in German East Africa. The subsidiary company was known as the Eisenbahn Gesellschaft fuer Deutsch Ostafrika (Usambara Line), and the construction of port facilities at Tanga was to be its first undertaking. It was originally intended that three lines should be built: Tanga was selected as the seaward terminus of a line heading north-westwards towards Kilimanjaro; a second line was planned to connect Dar es Salaam with Kigoma; and a third was proposed, but never built, from Kilwa south-westwards towards Lake Nyasa.<sup>12</sup> Preparatory work for the Usambara line was started in 1891, and actual construc-

tion in 1893. The building of a small jetty in 1892, designed to receive imported railway materials, marks the beginning of the *primitive* era of Tanga's port development (Table 6). Unfortunately, however, due to bad workmanship, part of the jetty collapsed in 1896. Attention was focussed upon Tanga and the Usambara line at this early period, rather than upon Dar es Salaam and the central line, for two main reasons: it was thought that the Usambara line would be easier to build (although in fact it was very badly constructed and did not reach

TABLE 6  
ERAS AND EPOCHS IN THE DEVELOPMENT OF THE PORT OF TANGA

<i>Era</i>	<i>Terminated by . . .</i>	<i>Present-day symbols</i>
I <i>Dhow traffic:</i>	Construction of a primitive jetty to unload railway materials, 1892.	
II <i>Primitive:</i> jetty for the unloading of railway materials.	Construction of a lighterage quay, 1914.	Lighterage quay.
III <i>Marginal quay extension:</i> lighterage quay, 1914: extended 1954.		Lighterage quay.

Moshi until 1911); and the German East Africa Company had already acquired vast tracts of land in the Usambara Mountains and several coffee and rubber plantations had been started. The railway proved, as was expected, an effective stimulus to the further development of plantation agriculture in this area. 1893 was also the year in which sisal was introduced into the Tanga area from Florida, an event which laid the foundation stone of Tanzania's principal modern agricultural industry and of the present-day export traffic of Tanga.<sup>13</sup>

Tanga did not move into the era of *marginal quay extension* until 1914, some years later than either Mombasa or Dar es Salaam. The unsatisfactoriness of the primitive jetty had been obvious for some time, but funds for improvements were not available until 1909 when the German government voted 1,500,000 marks for new installations at Tanga harbour. These installations consisted of a lighterage quay, together with sheds and ancillary equipment, and construction was completed in 1914. Unfortunately, however, the project was "an ignominious failure. It was, indeed, a strange and complex design. In 1913 the shore

at Tanga was littered with thousands of tons of reinforced concrete piles cast at Mannheim on the Rhine. They had been carried by river barges to Rotterdam and thence shipped to Tanga. The available records provide no answer to the question why these concrete works were not cast at Tanga. Soon after completion, part of the quay wall collapsed, another example of bad design, bad work and lack of common sense".<sup>14</sup>

No further major extensions took place at Tanga for forty years. Any further German developments were prevented by the first world war, after which, in the context of an East Africa unified under British administration, it seemed more reasonable to concentrate development on the larger ports of Mombasa and Dar es Salaam. From time to time considerable sums were spent in major repairs to the single lighterage wharf, but no strong pressure for an extension of the available facilities came until 1944 when Mr. J. R. Farquharson, then Chief Engineer, Tanganyika Railways, recommended the post-war construction of two deep-water berths at Dar es Salaam and one at Tanga.<sup>15</sup> This recommendation in respect of Tanga has, however, never been implemented, since traffic levels do not warrant the heavy expenditure that would necessarily be involved in overcoming the physical obstacles which the site of Tanga presents.

Unlike the two major East African seaports, Tanga has thus never progressed beyond the era of *marginal quay extension*. Certain major improvements were however completed in 1954, at a total cost of £1 million, and at a time when congestion at Mombasa was particularly severe. Clearly, pressure on facilities at Mombasa provided a stimulus for the provision of additional equipment at Tanga so that the latter port could absorb Mombasa's overflow traffic as required. The new developments consisted of a prolongation of the original 1914 lighterage quay towards the north-east, adding 770 feet to the length of the wharf. Large new warehouses were built, together with a modern passenger terminal, port offices, a small dockyard and a marshalling yard. Certain improvements were effected at the same time at the old wharf, and modern cargo-handling equipment was installed.

#### **The origin and growth of Dar es Salaam**

Whereas Mombasa, equipped with a dual harbour suited to both medieval and modern needs, has for centuries been a seaport of significance, the harbour of Dar es Salaam has no history of commercial activity before the third quarter of the nineteenth

century. Arab and Portuguese navigators and writers largely ignored the coast between Kilwa and Bagamoyo. The hostility of local inhabitants may have deterred an early Arab settlement, and the harbour is well hidden from the open sea and may have remained for long unknown; among others, Captain Owen<sup>16</sup> failed to realize the existence of the harbour at Dar es Salaam during his hydrographic survey of the coast in 1824-26, and in 1850 the explorer Krapf put in at Msasani but ignored the large harbour nearby.<sup>17</sup> However, to discover the scene of the *dhow traffic* era in the development of port activity in the Dar es Salaam area, one must travel a few miles north along the coast to the open roadstead port of Bagamoyo. For a very long period, but especially in the nineteenth century, Bagamoyo marked the end of the long caravan route to Tabora and Ujiji, along which unknown numbers of slaves and unknown quantities of ivory and other goods had travelled. Bagamoyo acted in the nineteenth century as a kind of mainland outpost to the principal emporium at Zanzibar; no port facilities were necessary, and none were built, since dhows could easily be drawn up on the beach.

TABLE 7

ERAS AND EPOCHS IN THE DEVELOPMENT OF THE PORT OF DAR ES SALAAM

<i>Era</i>	<i>Terminated by . . .</i>	<i>Present-day symbols</i>
<b>I</b> <i>Dhow traffic:</i> the open roadstead port of Bagamoyo; Seyyid Majid's attempts to develop Dar es Salaam.	Construction of first port facilities at Dar es Salaam 1900.	Beach at Bagamoyo; no present port activity.
<b>II</b> <i>Primitive:</i> Masonry stairways and shoots, 1900; railway contractors' jetty, 1905.	Opening of first lighterage quay, 1907.	Town Quay
<b>III</b> <i>Marginal quay extension:</i> lighterage quay, 1907; extended 1929, 1933.	Opening of deepwater berths, 1956.	Town Quay
<b>IV</b> <i>Simple lineal quayage:</i> Main Quay (deepwater berths).	The provision of modern facilities for the reception of crude oil, 1966.	Main Quay.
<b>V</b> <i>Specialized quayage:</i> Kigamboni jetty for the reception of crude oil for refining nearby.		Kigamboni jetty and associated oil refinery.

One may justifiably ask why the open roadstead at Bagamoyo was used in preference to the port of Dar es Salaam where the potentialities were so much greater. Apart from the important consideration of the greater proximity of Bagamoyo to the main centre of trade at Zanzibar, the chief reasons are related to navigational conditions and techniques and to the physical characteristics of the sites of the two ports. The development of a new port at Dar es Salaam and the simultaneous decline of Bagamoyo provides, in fact, a very interesting example of the interaction of geographical circumstances and historical events. In the days of sailing ships and small, easily handled cargoes, the flat sandy shore at Bagamoyo was quite adequate. Dar es Salaam, however, with its almost enclosed harbour, awkward entrance, and strong winds, tides and currents, was quite unsuitable for sailing ships; with the development of more easily controllable steamships the advantages of Dar es Salaam became increasingly clear, and Bagamoyo quickly declined into insignificance as ships and cargoes increased in size.<sup>18</sup> The period 1867-70, during which increasing interest was shown in Dar es Salaam harbour at the expense of Bagamoyo, is a curious and interesting period of transition during which the first attempts were made to utilize the deep-water harbour. The period does not fall squarely into the *dhow traffic era*, because dhows continued for the most part to use Bagamoyo; nor does it fall in the *primitive era*, since no port facilities were constructed. The foundation of a new port and town within the harbour of Dar es Salaam, near the site of the small village called Mzizima, was the work of Seyyid Majid, who succeeded his father Seyyid Said as Sultan of Zanzibar in 1856. Majid realized the advantages of a large and sheltered harbour, and decided to create there a new seaport, a new centre of trade, and an alternative, somewhat cooler residence to Zanzibar. His precise motive, like the motive of his father in moving to Zanzibar, is obscure, but seems to have been not so much the extension of Seyyid Said's trading network as a desire to escape from the political insecurity and intrigues of Zanzibar.<sup>19</sup> There is evidence that Seyyid Majid formally opened Dar es Salaam as a seaport in 1867;<sup>20</sup> the acting British consul at Zanzibar, Dr. Seward, did not rate the chances of success of the new venture very highly, writing that "the conception is good but the want of labour appears to be fatal to its realization; no considerable body of slaves could be kept together there . . . The settlements of Lamoo and Mombasa are flanked by tribes more dangerous to the fugitive slave than the Arab, but the

country behind Dhar Salaam has no such flight-restraining terror".<sup>21</sup> In 1867 Father Hoerner estimated the population of Dar es Salaam at "about nine hundred";<sup>22</sup> in the following year Bishop Steere commented that "there are some very fine buildings" and that "several Europeans went to Dar es Salaam for the sake of their health, and found great benefit".<sup>23</sup>

In 1870, however, Seyyid Majid died and was succeeded by Seyyid Barghash, who did not share his brother's enthusiasm for the development of Dar es Salaam. A hurricane in April 1872 caused much damage, and the buildings of the new town, many incomplete, were left to decay. Joseph Thomson, first of the early explorers to begin his expedition from Dar es Salaam, visited the town in 1879 and described its desolation: "the tenantless houses give shelter only to bats, owls, lizards and snakes, and the whole place wears the aspect of an old, battered and deserted city, instead of a new one just springing to life . . . But certainly, from the advantages which Dar es Salaam possesses over most places on the coast, there can be no doubt that it will, sooner or later, become all that its founder wished it to be".<sup>24</sup>

The establishment of a small trading station and of a mission settlement in 1887 marked the beginning of the period of German activity at Dar es Salaam, and also of a new phase in the development of the port.<sup>25</sup> Dar es Salaam became, under von Wissman, the main military depot of German East Africa, whilst Bagamoyo was retained for a time as the seat of government. In 1891, however, the government was transferred to Dar es Salaam, several commercial enterprises moved over from Zanzibar, and a customs department was created. Yet in 1898-99 the export customs revenue at Bagamoyo was Rs. 115,000, whilst that at Dar es Salaam was only Rs. 38,000.<sup>26</sup> A few port facilities were established at this time: the buoying of the intricate harbour entrance was begun in 1891, and a lighthouse was built on an outer coral reef in 1892-94; Bornhardt records that in 1900 "a series of masonry stairways and shoots, up and down which all cargo was manhandled into lighters, led from the natural narrow beach up the steep slope of the lowest coastal terrace to sheds and warehouses perched along the latter's upper edge".<sup>27</sup> A floating dock came into service in 1902, and a small dockyard was built near the entrance to Southern Creek; the small fleet of coastal vessels continued to grow, and repair facilities were provided for naval vessels.

Thus the period of Seyyid Majid's unsuccessful efforts to develop Dar es Salaam and the earliest years of the German

period lead gradually into the *primitive* era in the evolution of the port. The year 1900, when evidence first becomes available of the building of some simple aids to the unloading and loading of cargo, may be taken to mark the beginning of this era. A major stimulus to the development of the port in this era came, as at Mombasa and Tanga, with the construction of the railway to the interior, a project essential for the consolidation and extension of German political control and for the continued growth of Dar es Salaam at the expense of Bagamoyo, served only by slow-moving caravans. Surveys for a railway to Lake Tanganyika began in 1894 and construction commenced in 1905; closely following the route of the old slave caravans, except at its seaward end, the railway reached Tabora in 1912 and Kigoma in 1914. To facilitate the unloading of railway materials a small jetty was built at Dar es Salaam in 1905, and in the same year work was begun on a large customs shed and upon a more substantial quay equipped with cranes and joined to the town by road and rail. These developments form the basis of the present-day Town Quay. It is interesting to note that as early as 1906 the desirability of deep-water berths was pointed out, but it was not until fifty years later that this objective was achieved.<sup>28</sup>

The entry of Dar es Salaam into the era of *marginal quay extension* was marked by the opening of the first lighterage wharf in 1907. No further significant changes occurred until the end of the first world war when, after the defeat of Germany, Tanganyika emerged as a mandated territory under British administration. In 1921 an important development took place when sites at Dar es Salaam and Kigoma were leased to the Belgian Government to facilitate the handling of traffic to and from the eastern Belgian Congo; under the terms of the Milner-Ortiz Convention, Britain undertook to grant freedom of transit across East Africa to all traffic to or from the Belgian Congo and Ruanda-Urundi (former German territories administered by Belgium after 1919) on a footing of equality with traffic to and from Tanganyika. The sites in the ports of Dar es Salaam and Kigoma were leased to the Belgian Government in perpetuity, in return for an annual rent of one franc; the Dar es Salaam site was originally the northernmost of the two lighterage berths on the Town Quay. These sites were operated by a company entitled L'Agence Belge de l'Est Africain, S.A., known as Belbase.

Improvements to the port facilities at Dar es Salaam were made at various times in the 1920's and 1930's. An extension to the lighterage quay was completed in 1929; it then consisted of

930 feet of wharf, under British control, and a further 280 feet in the Belgian concession. A further extension, completed in 1933, had the effect of lengthening the British section to 1,166 feet. The inter-war period was also marked by a considerable improvement in the entrance to the harbour, achieved by dredging after a careful survey. There was a considerable increase in traffic in the late 1920's, partly as a result of increased mineral exports from the Congo, and a large new goods shed and marshalling yard were added to the existing terminal facilities. The depression of the 1930's meant that for a time little use was made of these facilities and, in the words of the Tanganyika geographer Clement Gillman, "reminded optimistic enthusiasts that the reviving port's vast hinterland was not a land of unlimited dormant wealth . . . but at best a somewhat precarious borderland . . . a realm where prudent stocktaking of resources rather than adventurous boasting . . . was the only correct way of approach."<sup>29</sup>

The post-1946 period has shown very considerable advances in tonnages handled at Dar es Salaam, and in terms of port facilities the principal reflection of this growth has been the provision of deep-water berths. This development, which marks the entry of Dar es Salaam into the era of *simple lineal quayage*, was actively considered for a number of years, and the original site investigations were made between 1927 and 1933. The decision to proceed with the construction of two deep-water berths was taken in 1949, and the Belgian Government, conscious of the need to develop its own share of the facilities of the port, decided to finance the construction of a third deep-water berth. In these circumstances a new agreement, supplementing the Milner-Ortiz Convention of 1921, was signed in 1950; this provided for the development of the new deep-water site in exchange for the old lighterage quay, and it was agreed that should the volume of Congo traffic expand so as to necessitate further extensions, such facilities would readily be made available. Work on the three deep-water berths was begun in 1951, and completed, at a cost of £4 millions, in 1956. The construction of the new deep-water berths involved the demolition of the old German dockyard, south of Kurasini Creek, and a new one was opened nearby in 1954.

The era of *simple lineal quayage* is still in progress at Dar es Salaam, since additional deep-water berths are now under construction. However, at the same time, the port has moved on into the era of *specialized quayage*, by the construction of an oil



refinery and the rehabilitation of an existing small jetty to receive crude oil. These facilities were completed in 1966.

**The foundation and development of Mtwara**

The story of the development of Mtwara is somewhat different from those of the more northerly seaports of East Africa. The *dhow traffic* era is comparable, but the transition into the *primitive* era did not take place, as at the other ports, as a result of railway building projects. The era of *marginal quay extension*, moreover, is completely unrepresented at Mtwara, for the port progressed directly from the *primitive* era into the era of *simple lineal quayage* when deep-water berths were opened in 1954. Thus the stages of development at Mtwara do not follow the pattern established elsewhere on the East African coast and, although the port is today a small and relatively insignificant trade centre, the details of its evolution merit attention because of this departure from the more characteristic pattern of *Any (East African) seaport*.

In pre-steamship days the winds, currents and reefs off the mainland coast of East Africa induced sailing ships to keep well out at sea when making their way up and down the coast between Mozambique and the ports to the north. This explains, in part, why some of the present-day seaports remained unutilized and even unknown outside their immediate locality until relatively recent times. Mtwara, however, provides an example of

TABLE 8  
ERAS AND EPOCHS IN THE DEVELOPMENT OF THE PORT OF MTWARA

<i>Era</i>	<i>Terminated by . . .</i>	<i>Present-day symbols</i>
I <i>Dhow traffic:</i> Mikindani Harbour	Construction of a sisal wharf in Mtwara harbour, c. 1920.	Mikindani harbour.
II <i>Primitive:</i> Sisal wharf	Opening of deepwater berths, 1954.	Sisal wharf (disused)
IV <i>Simple lineal quayage:</i> deep-water berths		Deep-water berths.

a harbour known to navigators from the late eighteenth century but which remained unutilized until the mid-twentieth century when changed economic circumstances made its development possible. Mtwara thus illustrates clearly the general principle

that port development is not a reflection of the availability of good natural harbours, but rather of changing navigational and economic circumstances and of changing patterns of land and sea traffic.

Evidence relating to the *dhow traffic* era of the development of Mtwara is available from the late eighteenth and nineteenth centuries. In Chapter II attention was drawn to the distinction between the two separate harbours located in the inner reaches of Mikindani Bay; the shallow Mikindani Harbour and the deep-water Mtwara harbour. Mikindani Harbour provided the setting for the *dhow traffic* era of port development in this area, and this small harbour stands as the southern counterpart of Mombasa Old Harbour and of Bagamoyo and, like them, retains the form and function of earlier centuries since modern developments have utilized a different site. French traders, taking slaves from the mainland to their new plantations on the Ile de France (Mauritius) and Bourbon (Réunion) were probably amongst the first to become aware of the existence of Mikindani Bay. Sir John Gray has drawn attention to a reference to 'Miquimdany' by the Chevalier Saulnier de Mondévit, who made a hydrographical survey of part of the East African coast in 1787.<sup>30</sup> The French were also responsible for a chart delineating Mtwara Bay, reproduced by Alexander Dalrymple, hydrographer to the East India Company, in 1796.<sup>31</sup> Dr. David Livingstone stayed at Mikindani in 1866 at the outset of his last journey, and described the bay as "a beautiful landlocked harbour . . . a first-rate harbour for Arab dhows . . . completely screened by the masses of trees growing all around it from seaward observation".<sup>32</sup> The reference is clearly to Mikindani Harbour and not to Mtwara Bay. The first detailed survey of Mtwara Harbour was undertaken by Captain J. W. Dixon of H.M.S. *Nassau* in 1874,<sup>33</sup> Dixon's chart remained unaltered until 1947, and it was on the basis of the promising figures marked on his chart that Mtwara was selected as the site of a new port seventy-five years later.<sup>34</sup> The explorer Joseph Thomson passed through Mikindani and recorded in 1882 that it had "prospered immensely since Livingstone visited it in 1866. . . . The trade has increased exceedingly, almost the entire produce of the Rovuma region finding its way there — gum copal, rubber, millet, rice and other grains being the chief articles, though the trade in ivory and slaves . . . is by no means unimportant. South of Bagamoyo, Mikindany will now rank in importance next after Kilwa and

Lindy".<sup>35</sup> Again the reference is clearly to Mikindani rather than to Mtwara, but the account provides the first firm indication of significant commercial activity other than slave-trading in the Mikindani Bay area.

The first indication of a transition from the *dhow traffic* era to the *primitive* era, and of a change in the balance of activity between Mikindani and Mtwara harbours, is provided in 1920 by the building of a small jetty on the western side of the entrance to Mtwara harbour. This jetty, the first port construction of any kind within Mtwara harbour, was developed to facilitate the export of sisal from an estate, originally a German undertaking, which then occupied much of the land around the harbour. The fact that the sisal transported over this jetty was subsequently transhipped at Mikindani reveals the dominant role still played at this time by Mikindani harbour. The sisal jetty, still in existence today but no longer used, is the only evidence of the utilization of Mtwara harbour for trade purposes before very recent years.

It was not until 1954, when deep-water berths were opened, that Mtwara moved on from the *primitive* era to a more advanced stage of port development. The era of *marginal quay extension* was completely by-passed, since no lighterage quays were built, and the era of *simple lineal quayage* was introduced in somewhat artificial circumstances. In spite of its excellent site conditions, Mtwara has never been able to overcome its disadvantageous land situation, with a small and relatively unproductive hinterland. The necessary stimulus for post-*primitive* development at Mtwara was provided by the "groundnut schemes" of the immediate post-1945 period, when there was a serious world shortage of edible oils and fats. Despite local advice to the contrary, it was envisaged that several centres in Tanganyika could quickly become the foci of major groundnut-producing areas. In 1946 the Overseas Food Corporation, in association with the British Government, drew up a plan for the establishment of 107 mechanized units of 30,000 acres each, designed to produce a minimum of 600,000 tons of groundnuts a year by 1950-51; of these units, the principal group of 55 was to be in the Southern Province of Tanganyika in the hinterland of Mtwara, with 25 elsewhere in Tanganyika, 17 in Northern Rhodesia and 10 in Kenya. Capital expenditure was estimated at £24 millions, and a profit of £10 millions a year was envisaged on the basis of the estimated minimum production of 600,000 tons.<sup>36</sup> Localized production for export on such a scale demanded

the provision of port facilities which at that time were not in existence anywhere in Tanganyika. Considerable development was therefore necessary at whatever terminal might be selected. A Harbour Commission appointed by the British Ministry of Food visited Lindi and Kilwa Kisiwani in February 1947; these ports were initially thought to be able to provide adequate outlet facilities; finding their disadvantages of site too great for the construction of deep-water berths, however, the Commission recommended the development of an entirely new port within the harbour of Mtwara, designed to meet the needs of the groundnut project and also such further requirements as future developments beyond the groundnut schemes might one day call for. In addition to its deep, sheltered and capacious harbour, Mtwara provided a suitable site since there were no difficulties involved in finding adequate level ground for the construction of wharves, a rail terminal, a town and an airport.

As first proposed, the groundnut schemes gave rise to considerable optimism which proved in the event to be unfounded. The scheme in southern Tanganyika was thought likely "to cause a revolutionary upheaval at Mtwara, one that will advance the area and its people and provide opportunities for such progress in so short a time that none could have dreamed possible. . . . The villagers of Mtwara already speak of their village as a future Mombasa".<sup>37</sup> A detailed hydrographic survey was made, and plans for the new port and town were rapidly drawn up. Construction work on the new port facilities began in 1948, and in the following year a railway was opened from Mkwaya, at the head of Lindi Creek, to Ruo and Nachingwea.<sup>38</sup> The port of Lindi, meanwhile, was improved so as to serve the scheme until the Mtwara developments were completed. By 1951, however, local conditions and the world market made it apparent that large-scale groundnut production was not a practical proposition and the scope of the scheme was therefore considerably reduced. The railway administration nevertheless hoped that general agricultural development might eventually provide sufficient traffic to cover operating costs on the new line within the space of a few years; the Mtwara-Ruo rail link was therefore completed and opened at the same time as the new deep-water facilities at Mtwara in 1954. The date marks the transition of the port from the *primitive* era of development directly into the era of *simple lineal quayage*. In 1958 a 23-mile rail extension to Masasi was added as a last bid to attract more traffic. There proved, unfortunately, to be no tendency for earnings to increase and the total freight traffic

handled — amounting only to 32,616 tons in 1958, the peak year — never reached 25 per cent of the level originally envisaged. In addition to the failure to produce cash crops on the scale forecast, the eventual closing of the line in 1962 was partly due to increasing road competition; road transport was the traditional method, focused on Lindi before Mtwara was developed, and the planned re-orientation to the new rail-served port never took place to the expected extent; furthermore, road hauliers avoided transshipment costs at the Nachingwea and Masasi rail-heads and, by using the railway to absorb peak loads, could operate generally at full capacity.

The failure of the complex plans involved in the groundnuts project had important repercussions at Mtwara. The town was never built as planned, but a few shops, a bank, an hotel and various government offices now stand in isolation, separated from each other by bumpy lanes and stretches of open grassland. The town has been “built in small patches, like a crossword just begun”.<sup>39</sup> The closed railway to Nachingwea and Masasi has now been lifted, and the lines used elsewhere; the government of independent Tanganyika was not prepared to meet the annual losses of about £200,000 that were entailed. In a sense the port facilities now available at Mtwara are not fully utilized, since traffic there follows a very markedly seasonal pattern; although at certain times of year facilities are under pressure, for the remainder of the year the activity of the port reaches only a low level.<sup>40</sup>

Although they have been widely discussed, the reasons for the failure of the development schemes so closely associated with transportation in this corner of East Africa are not easy to assess, and a lengthy discussion of the problem would not, in any case, be appropriate here. The basic reason was, however, an urgent desire for rapid and spectacular results, of a type which Africa rarely yields, a desire that inevitably involved inadequate preparation and inadequate investigation of the complex ecological factors that to a large extent control development in such an area. The eventual total cost of the scheme — some £35 millions — was not, however, entirely wasted. Southern Tanzania is now equipped with a deep-water port which, although not proving a marked stimulus to development within its hinterland, probably provides adequate port facilities for some time to come. Groundnut production in the Nachingwea area is quite considerable, and the agricultural pattern of this and other development areas associated with the groundnut project has to some

extent been diversified. Skilled labour and professional services have also proved, in part, to be of permanent benefit. But perhaps the most worthwhile result of the project was a new and rather expensive demonstration of the fact that in Africa development schemes must make haste slowly and in full cognizance of the ecology of the areas involved.

#### Notes and References

1. The phrase is taken from Sir Charles Lucas, *The partition and colonization of Africa* (Oxford: Clarendon Press, 1922), p. 9.
2. J. H. Bird, *The major seaports of the United Kingdom* (London: Hutchinson, 1963), pp. 24-34.
3. *Ibid.*, p. 26.
4. M. F. Hill, *Permanent Way, Vol. I, the story of the Kenya and Uganda railway* (Nairobi: E.A.R. & H., 1949), p. 148.
5. *Ibid.*
6. Sir G. Molesworth, *Report on the Uganda Railway, Africa*, No. 5, 1899. Quotations from the *Report* are given in Hill, *op. cit.*, pp. 179-85.
7. Colonel Gracey's report was printed in *Africa*, No. 6, 1901, and is quoted in Hill, *op. cit.*, pp. 204-210.
8. Cited in Hill, *op. cit.*, p. 321.
9. Hill, *op. cit.*, pp. 477-78.
10. The site of No. 6 berth has never been developed, for reasons connected with the instability of the site which includes a natural drainage channel.
11. For further technical details on the Kipevu oil-tanker jetty see 'New tanker berth at Mombasa' (anon.), *The dock and harbour authority*, 44, 1964, pp. 282-85.
12. Accounts of the development of the railway system of Tanganyika are to be found in M. F. Hill, *Permanent Way: Vol. II, the story of the Tanganyika railways* (Nairobi: E.A.R. & H.), 1957, and in C. Gillman, 'A short history of the Tanganyika railways', *Tang. notes and records*, 13, 1942, pp. 1-43.
13. Sir E. Hitchcock, 'The sisal industry of East Africa', *Tang. notes and records*, 52, 1959, 4-17.
14. Hill, *Permanent Way, Vol. II*, p. 75.
15. Farquharson, J. R., *Tanganyika transport: a review* (Dar es Salaam: Govt. printer), 1945.
16. Capt. T. Boteler, *Narrative of a voyage of discovery to Africa and Arabia performed in His Majesty's ships Leven and Barracouta from 1821 to 1826* (London, 2 vols.), 1835.
17. J. L. Krapf, *Travels, missionary researches and labours in eastern Africa* (London: Trübner), 1860.
18. Strong opposition from Bagamoyo towards its replacement by Dar es Salaam received a firm setback in 1892 when a cruiser squadron of the German navy successfully steamed into and out of Dar es Salaam harbour.
19. Controversy surrounds the origin of the name 'Dar es Salaam'. The derivation from the Arabic phrase *Bandar-ul-Salaam* (harbour of peace) has been for long accepted, but J. W. T. Allen suggests that a more likely source is the phrase *Dar-Ulslam* (land of peace). See M. Hartnoll, 'A story of the origin of the name Bandar es Salaam, which in the old days was called Mzizima', *Tang. notes and records*, 3, 1937, 117-19; and J. W. T. Allen, 'The name Dar es Salaam', *Tang. notes and records*, 19, 1945, 67-68.
20. In a short article entitled 'The opening of Dar es Salaam as a seaport' (*Tang. notes and records*, 59, 1962, p. 224) Sir John Gray draws attention to correspondence between two successive United States consuls at Zanzibar and the Secretary of State, Foreign

- Department, Washington, which appears to show that Seyyid Majid went through a ceremony of formally opening Dar es Salaam as a seaport in September 1867.
21. Zanzibar Archives, Political Agent to Bombay Government, 1865-67. Dr. Seward commented further that "the narrowness of the leading channel is a drawback which only the presence of a steam tug can countervail. This want has been anticipated and a powerful steam tug ordered from Hamburg".
  22. G. Schneider, *Die Katolische Mission von Zanguabar, Thaetigkeit und Reisen des Pater Hoerner* (Regensburg, 1877). (For this and other early German references, which I have not been able to consult personally, I am indebted to the late Mr. C. Gillman's paper 'Dar es Salaam, 1860-1940: a story of growth and change', *Tang. notes and records*, 20, 1945, 1-23).
  23. *Report from the select committee on the slave trade (East coast of Africa)*, 1871. Cited in Sir John Gray, 'Dar es Salaam in 1868', *Tang. notes and records*, 24, 1947, 1-2.
  24. J. Thomson, *To the central African lakes and back* (London, 1881), pp. 73-75.
  25. Dr. Karl Peters founded the Gesellschaft fuer Deutsche Kolonisation in 1884, and in the following year this became the Deutsche Ostafrikanische Gesellschaft. These developments did not however directly affect Dar es Salaam.
  26. Cited in Gillman, 'Dar es Salaam', p. 7.
  27. W. Bornhardt, *Zur Oberflaechengestaltung und Geologie Deutsch Ostafrikas* (Berlin, 1900), p. 198.
  28. H. Paasche, *Deutsch Ostafrika* (Berlin, 1906) pp. 190-94.
  29. Gillman, 'Dar es Salaam', p. 16.
  30. Sir J. M. Gray, 'Mikindani Bay', *Tang. notes and records*, 59, 1962, p. 287.
  31. *Ibid.*, 'Mikindani Bay before 1887', *Tang. notes and records*, 28, 1950, 29-37.
  32. Letter to the Earl of Clarendon, 18 May, 1866. Cited in Gray, 'Mikindani Bay before 1887', p. 31. See also H. Waller (ed.), *The last journals of David Livingstone* (London: John Murray, 1874; 2 vols.), vol. I, pp. 14-15.
  33. J. W. Dixon, 'Mikindani Bay, east coast of Africa', *Nautical Magazine*, 1874, pp. 840-41. See also a note on this survey in *Petermann's Mitteilungen*, 21, 1875, p. 118; and P. H. Johnston, 'Mtwara Bay', *Tang. notes and records*, 24, 1947, 61-65.
  34. At the time when Mtwara was developed as a deep-water port the headman of Mtwara village claimed to remember the 1874 survey taking place.
  35. J. Thomson, 'Notes on the basin of the river Rovuma, East Africa', *Proc. roy. geogr. soc.*, 4, 1882, p. 76.
  36. *A plan for the mechanized production of groundnuts in East and Central Africa* (London: H.M.S.O., 1947), Cmd. 7030.
  37. Johnston, op. cit., pp. 63, 64.
  38. This line should not be confused with the "Lindi tramway", one of several temporary light railways constructed to carry supplies to the forces during the first world war. The Lindi tramway was lifted in 1932. See Hill, *Permanent Way*, vol. II, pp. 180, 195.
  39. *The Observer*, 2 September, 1962.
  40. The closure and lifting of the "groundnuts line" has been widely regarded as an obvious necessity, since a poor country cannot afford to waste £200,000 a year on keeping open an uneconomic line. Taking a long-term view of the situation, however, it is to be hoped that Tanzania will not regret her decision to remove the railway from an underdeveloped area where alternative forms of transport are barely adequate for present needs.

## 4

### PORT EQUIPMENT AND ORGANIZATION

Port capacity, in as far as it determines a country's ability to engage in external trade, is often an indicator of the country's prosperity. This is particularly true of the new states of Africa, the vast bulk of whose trade is with overseas areas. In this chapter, therefore, an attempt is made to compare briefly the principal seaports of East Africa in terms of their present-day facilities. In using the present-day equipment of the ports as a basis for comparison it must be remembered that the value of the comparison is to some extent reduced by the fact that berths and cargo handling appliances are not necessarily in full use at all times, since the flow of traffic at *Any (East African) seaport* may vary considerably from one season to another. Further, assessment of port capacity in a geographical sense is an exercise not normally carried out by the East African Railways and Harbours Administration; the view of the Administration on the complex question of port capacity is that "different assessments might be given for any combination of an unlimited number of separate sets of circumstances and conditions, and would vary quite substantially according to the period on which the average is based".<sup>1</sup> The figures given in Table 9 cannot represent more than an approximate indication of the relative capacity and significance of the seaports of East Africa. They do however serve to illustrate the very wide variation that exists between the largest and the smallest of these ocean terminals, and to emphasize the present-day hierarchy of seaports as it has been shown to exist in Chapter 3.

#### **Port facilities at the four sea terminals**

There is no doubt whatever that Mombasa is the best equipped of the seaports of East Africa, not only in terms of the extent of quayage and associated equipment but also in most other senses as well. In spite of this Mombasa has frequently suffered in the past, and still suffers today, from congestion which at times is serious. The modern port of Mombasa, or Kilindini, is made up basically of three component parts: a series of lighterage wharves, slipways and other relatively minor port installa-



TABLE 9  
EAST AFRICAN SEAPORTS: FACILITIES AND EQUIPMENT

	Mombasa	Dar es Salaam	Tanga	Mtwara	Total
Deep-water berths: number	13	3	—	2	18
length (ft.)	7,690	1,800	—	1,248	10,738
Lighterage wharves: number	2	4	2	—	8
length (ft.)	1,350	1,929	1,250	—	4,529
Number of lighter handling points	9	8	9	—	26
Transit sheds: number	16	6	9	3	34
floor area (sq. ft.)	988,358	430,940	235,867	80,000	1,735,165
Stacking grounds: area (sq. ft.)	539,835	496,934	81,832	50,000	1,168,601
Total storage area: (sq. ft.)	1,528,193	927,874	317,699	130,000	2,903,766
Cargo lighters and pontoons: number	31	30	32	3	96
capacity (tons)	7,295	5,590	6,380	470	19,735
Cargo handling appliances:					
Crane capacity (tons):	4211	218	74	46	759
Scammells: horses	32	13	5	1	51
trailers	74	26	13	3	116
Forklift trucks:	85	30	13	3	131
Pallets:	26,984	16,000	1,369	1,014	45,367
Platform trucks:	47	33	4	13	97
Tractors:	1	4	—	—	5

Source: East African Railways and Harbours, *Annual report, 1964*, pp. 56-57.  
1. Excluding a 60-ton floating crane.

tions situated on the south-western shore of Mombasa Island between Ras Kilindini and Likoni Ferry; a series of nine deep-water berths, and the Shimanzi oil jetty, built along the north-western shore of Mombasa Island between Ras Kilindini and Makupa Creek; and a series of four deep-water berths, and the Kipevu oil terminal, situated at Kipevu on the mainland north of the entrance to Port Reitz and connected to the island by a road-rail causeway.<sup>2</sup> The extent and predominance of deep-water facilities is an important feature at Mombasa which contrasts with the position at the other major East African terminals. Minor installations include bulk cement loading equipment located at Ras Kidomoni within the Old Harbour. The extensive stacking grounds and transit sheds which lie adjacent to the deep-water quays at Kilindini are all rail-served, emphasizing the fact that transport within the port area itself, as well as transport to and from the port by land and sea, is an essential aspect of port working.

The extent of port facilities and the cargo-handling capacity is considerably less at Dar es Salaam than at Mombasa. Whereas Mombasa is able to accept ships of up to 65,000 tons deadweight and can accommodate over 50 ships at one time, Dar es Salaam is only able to accept ships of up to 25,000 tons and cannot provide simultaneous anchorage for more than 15 deep-water vessels. Port facilities at Dar es Salaam may be divided geographically into two main parts, separated by the shallow Kurasini Creek: to the north of the Creek lies the Town Quay, the older part of the port, where there are four lighterage wharves; and to the south is situated the Main Quay, where there are three deep-water berths, one of which is now under the administration of a quadripartite Commission established by the governments of the Congo (Kinshasa), Rwanda, Burundi and Tanzania. A dhow and schooner wharf and a bulk oil jetty are situated on the western shore of Southern Creek.

Tanga is equipped only as a lighterage port, as a result of restricted draught at all points near the shoreline. There are two lighterage wharves, a passenger landing pier and a dhow and schooner wharf. Tanga is able to accommodate at any one time five ocean-going vessels of up to approximately 17,000 tons. Lighterage is, of course, an awkward and time-consuming process, but since Tanga acts chiefly as a sisal-exporting port the delays and damage often associated with lighterage are not particularly significant factors in this case. Port facilities at Mtwara bear little relation to the extensive deep-water harbour

available there; a deep-water quay with two berths is sited on the southern side of the harbour, and this quay is used for all cargo movements including the unloading of petroleum products by pipeline. Mechanization is employed as much as possible at

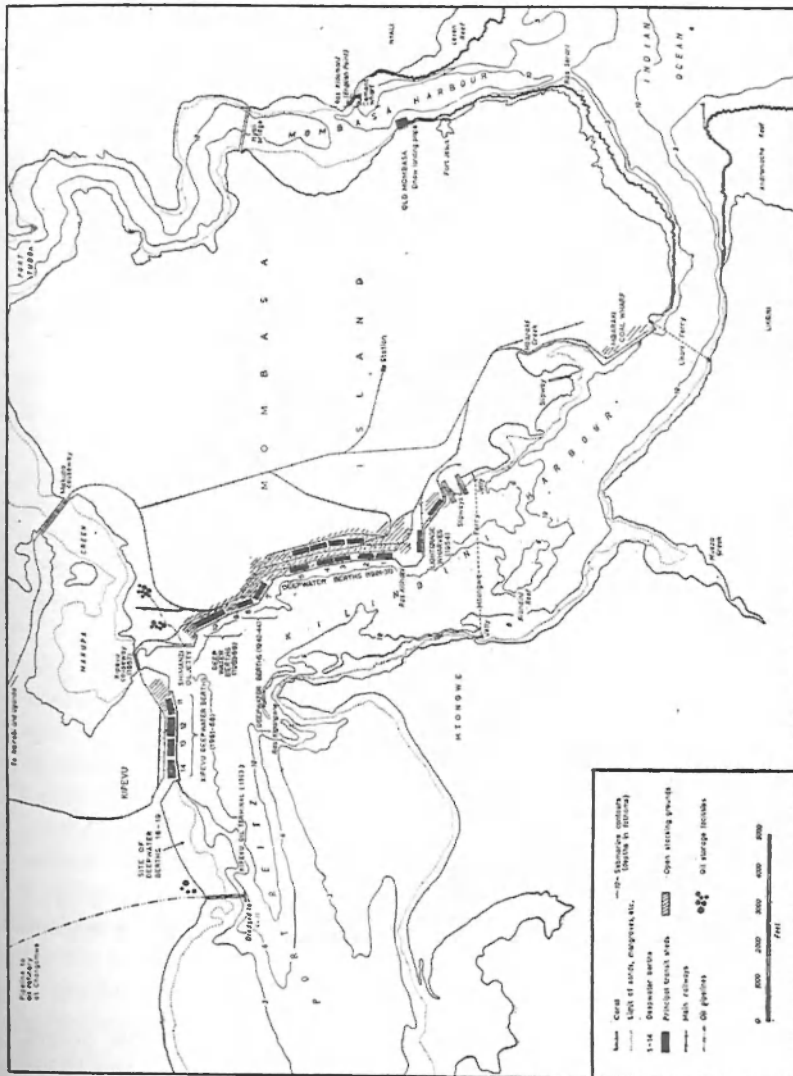


Figure 7. Port facilities at Mombasa  
Adapted from Admiralty Chart No. 666.

all four ports, especially at Mombasa, but the amount of equipment varies considerably.

### The inadequacy of present port facilities

There is little doubt that the level of facilities at the ports serving East Africa is not adequate to deal with present-day traffic

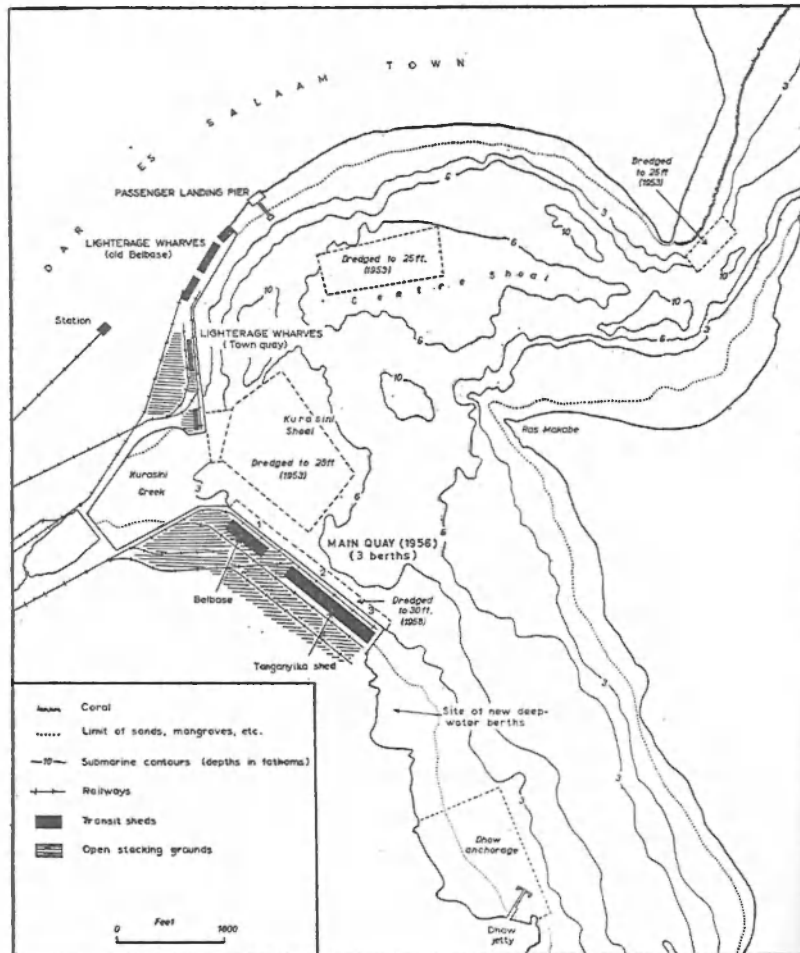


Figure 8. Port facilities at Dar es Salaam  
Adapted from Admiralty Chart No. 693.

movements without involving frequent and considerable delays. This is particularly true of the two larger ports. During the 1950's a very unsatisfactory situation developed at Mombasa in relation to the average length of time that a ship had to wait for a berth and the average time taken in working a ship, and the opening of the Kipevu extensions in 1961 did no more than keep pace with traffic increases. In 1964 the average waiting days in port per

ship declined to 0.76 (1963, 1.24) and the average working days to 3.05 (1963, 3.23);<sup>3</sup> but in the first half of 1965 a serious state of congestion arose at Mombasa involving delays of up to 12 days before working. A number of factors caused congestion at this particular period; the simultaneous arrival of an unusually large number of ships with heavy cargoes (imports for January-March 1965 were 35 per cent higher than for the same quarter of 1964); the inadequacy of the port labour force at such a time; and the shortage of wagons for railing goods up-country. Although extra labour was promptly recruited, it became very clear that present port facilities at Mombasa are inadequate for the prompt and efficient movement of goods during peak periods, and that the margin of spare capacity available over and above normal working conditions is very small. In these circumstances it is surprising that five years were allowed to elapse between the completion of the basic construction and the final equipment for service of the third and fourth deep-water berths at Kipevu; the main problem is, of course, shortage of capital and the dangers of over-capitalization and resultant high interest charges. Attention has now been directed, however, to the course of further port expansion, and plans have been drawn up for the building of four further deep-water berths on the mainland coast at Kipevu between berth 14 and the oil terminal. Initial site clearance began towards the end of 1965.

At Dar es Salaam there was a marked improvement in shipping turnaround immediately following the opening of the deep-water quays there in 1956, an event which relieved a considerable degree of congestion that had built up, and changed the character of the principal port operations at Dar es Salaam from lighterage to normal wharfage. At the time this development gave rise to the widespread opinion that the port was equipped with adequate facilities for handling the likely volume of traffic for a good many years to come. Ten years later, this optimistic opinion was no longer justified, and plans have been announced for the building of two additional deep-water berths to the south of the Main Quay. The facilities for the reception of oil have also undergone improvement: a project similar to the Changamwe-Kipevu oil developments at Mombasa was completed at Dar es Salaam in 1966, involving the rehabilitation of the oil jetty to receive tankers discharging crude oil, and the connection of the jetty by means of a submarine pipeline to a refinery at Kigamboni on the eastern shore of Southern Creek. The oil jetty is designed to accommodate tankers of up to

36,000 tons deadweight, but the maximum size of tanker that can be received in the harbour at present is 575 ft. length and 32 ft. draught. The reception of larger tankers would necessitate considerable dredging and deepening of the harbour entrance. In spite of pressure from the oil companies involved, who would naturally have favoured a more economic project involving larger tankers and a larger refinery, the Tanzania government is not at present prepared to finance developments which are inessential in present circumstances. In view of current trends in tanker size and oil consumption it may prove in due course that the siting of the refinery is suited only to temporary conditions.

Pressure on facilities at the two smaller ports is not so marked. At Tanga, where exports of sisal, the main commodity handled, have risen steadily over the past decade, there has been only a slight tendency towards congestion. This reflects the comparatively low level of traffic handled, but may also result from the situation of Tanga; in the event of undue pressure developing on facilities there, traffic could without difficulty be diverted from all but the immediate environs of Tanga to either Mombasa or Dar es Salaam. The process of course works also in the opposite direction; the expansion of lighterage facilities at Tanga in 1954 took place at a time when port congestion at Mombasa was particularly severe, and one of the main factors stimulating the physical growth of Tanga was the function of the port as an overflow for Mombasa, a role which Tanga could perhaps fulfil more effectively today if political circumstances allowed. Mtwara, in the far south of Tanzania, is too far away from the main East African centres of export crop production to serve the same function in relation to Dar es Salaam. Yet congestion has recently made itself felt at Mtwara, in spite of the fact that the port has fallen far short of fulfilling its originally planned function as a major groundnut-exporting port. The chief cause of delays to shipping at Mtwara — which in 1964 were higher than at Tanga in terms of waiting days — is essentially the markedly seasonal nature of the export traffic of the port. At the larger East African seaports exports of certain major commodities are also confined to certain seasons, but the seasons tend to occur at different times of year so that although overlapping occurs extreme seasonal congestion is to some extent avoided. At Mtwara, however, facilities are very limited and there is only one major item of export — cashew nuts; exports take place largely in the

November-January period, and sometimes coincide with the movement of the bulk of the cassava crop. During this period, therefore, the port of Mtwara is very busy indeed, and to cope with pressure on storage facilities a new transit shed has recently been built. During the rest of the year, however, the facilities at Mtwara are definitely underworked, and comparatively little traffic passes across the quays.

#### **Port capacity and port efficiency**

The related questions of port capacity and port efficiency are complex issues and to a large extent they lie outside the scope of this geographical study. Some general points of geographical interest may, however, be made. At the two major ports of Mombasa and Dar es Salaam berths are comparable from the viewpoint of efficiency of working. At these ports the practical (as distinct from the potential) capacity per fully equipped berth is taken as 142,000 deadweight tons per annum. The potential capacity of the two lighterage wharves at Tanga has been assessed at 320,000 deadweight tons per annum. No detailed estimate has been made of the potential capacity of Mtwara, but the figure is thought to be between 200,000 and 250,000 tons per annum.<sup>4</sup>

A number of factors, several of them geographically significant, affect the variations in tonnages handled per ship working day at the individual ports.<sup>5</sup> The generally higher levels achieved at Mombasa and Dar es Salaam no doubt reflect the greater size and greater degree of mechanization at these ports, whereas Tanga with its inefficient lighterage system remains fairly consistently at the bottom of the scale. Mtwara, which shows the widest variation, is rather a special case; very high figures are achieved there during the October-January period when the cashew-nut crop is exported along with cassava and other produce, and when the port is working under pressure; during the remainder of the year much lower figures are the rule because there is little traffic moving and little incentive to move goods quickly. At the larger ports the most potent factor influencing the pattern of tonnages handled per ship working day is the weather. During the early part of the year, especially the period March-May, and again at the end of the year (October-December), the coastlands of East Africa experience heavy rainfall which frequently interferes considerably with ship working. Conversely, the peaks which occur at Mombasa and Dar es Salaam in the third quarter of the year represent a higher level of working during the cool dry season.

**The organization of port working**

The East African Railways and Harbours Administration is the statutory port authority for all the mainland ports of East Africa, and administers each one, on a non-profit-making basis, on behalf of the East African Common Services Organization which provides common services in Kenya, Uganda and mainland Tanzania. The authority over port matters is vested in the General Manager of the E.A.R. & H. (Nairobi), and is exercised departmentally for the East African mainland seaports by a Chief Ports Manager with headquarters at Mombasa; each individual port is under the immediate control of a Port Manager (Mombasa, Dar es Salaam and Tanga) or Officer-in-Charge (Mtwara). The E.A.R. & H., as the port authority, is responsible for port management, the construction and maintenance of facilities, the provision of shore equipment (the maintenance of which is carried out by the railways as distinct from the port authority), and the direct operation of ancillary port services such as pilotage, tug assistance to ships, and craning.

All cargo handling on shore and on ship is carried out on behalf of the East African Railways and Harbours Administration by its contractors, East African Cargo Handling Services Ltd. This system came into operation in 1964 as a result of a major re-organization of cargo-handling facilities and methods. Previously the handling of cargo at the four ocean terminals had been divided between the two complementary services of stevedoring (handling of cargo on board ship) and shore handling. These services were carried out by different organizations; stevedoring was carried out under licence by four privately-owned commercial firms, the East African Lighterage and Stevedoring Company Ltd., the African Wharfage Company Ltd., the Tanganyika Boating Company Ltd., and Associated African Dock Enterprises Ltd., whereas the sole contractor for shore handling was the Landing and Shipping Company of East Africa Ltd., in which the E.A.R. & H. held a majority of the shares.

In 1962, at a time when tonnages handled per ship working day were declining at all East African seaports as compared with the period 1959-61, and when labour unrest was causing serious concern, it became increasingly obvious that this system was unsatisfactory and was not conducive to maximum efficiency in port working. The government of Tanganyika thereupon engaged Dr. Amos Landman, manager of the port of Haifa, to examine the working of the existing system with special reference to Dar es Salaam, and to make recommendations for improvements. The



Landman Report,<sup>6</sup> although concerned specifically with Dar es Salaam, was generally taken to refer to all the four mainland ocean terminals. The report recommended that, in the interests of cargo-handling and the national use of costly equipment and manpower, complete co-ordination of ship and shore working should henceforward be effected through the medium of a single operating company, publicly-owned and operated under the direct authority of the E.A.R. & H. The report made it clear that the division of responsibility for stevedoring between four private, profit-making firms, led to a marked loss in efficiency, adversely affecting the turn-round of shipping and the prompt clearance of cargo. This move towards the 'nationalization' of port working, as it has been termed, was widely supported and was accepted by the three East African governments. The result was the formation of a unified organization termed the East African Cargo Handling Services Ltd. in which all shares are held by the E.A.R. & H. Administration. The new system came into operation on 1 January 1964. All the employees of the four commercial companies were offered employment in the new company, which took over the shares and assets of the defunct companies at agreed valuation. The new company employs over 12,000 employees of whom over 10,000 are manual workers. The adoption of the system of placing cargo handling on ship and on shore under the control of a single organization, a system that is part of the accepted pattern at many large ports, has effected an improvement in the efficiency of port working in East Africa.

#### Notes and References

1. Communication from Mr. D. A. Simister, Commercial Assistant to the Chief Ports Manager, E.A.R. & H., Mombasa, 25 July, 1963.
2. The disparity between the enumeration of the deep-water berths at Mombasa and their actual number arises from the non-existence of berth no. 6. See Chapter III, note 10.
3. Details from correspondence with the Chief Ports Manager, E.A.R. & H., Mombasa, March-June 1964.
4. *Ibid.*
5. A 'ship working day' is a statistical concept based on the fact that on several holidays during the year no ship working takes place. Other interruptions such as strikes are also taken into account. The number of ship working days per year is thus equal to six days per week minus holidays, strikes etc.
6. A. Landman, *Report on the port of Dar es Salaam* (Haifa, 1962; reproduced by the E.A.R. & H., Nairobi). Cyclostyled, 23 pp.

## 5

### THE STRUCTURE OF PORT TRAFFIC

Patterns of commodity flow through a seaport may be analysed in various ways. In East Africa, with four separate mainland ocean terminals and a large number of commodities moving through each port in both directions and in varying quantities, it is not easy to build up simultaneously a detailed picture of the total traffic handled at each individual port and a comparative statement of successive aspects of the traffic of the port group as a whole. In this chapter emphasis is placed on the question of comparability, thus to some extent leaving the reader to build up in his own mind a parallel impression of the traffic of the individual terminals. Attention is devoted mainly to exports since these reflect more closely than imports the detailed relationships between port and hinterland.

#### **Shipping movements**

The number and net registered tonnage of shipping entering the four major mainland seaports of East Africa has shown a gradual overall increase during the past twenty years. Recently, the number of ships has shown little tendency to change significantly, and the following figures for the year 1964 are typical of recent years: Mombasa, 1,548; Dar es Salaam, 1,030; Tanga, 571; Mtwara, 232.<sup>1</sup> The net registered tonnage of ships entering East African seaports has risen more sharply than the number of ships; this is important, since a declining, steady or only slightly rising number of ships does not necessarily indicate a lack of progressive activity at a port but more often reflects increasing ship sizes and economies in sea freight movements, for the greater the proportion of cargo landed or shipped at one port, the greater are the economies effected in ship working. The net registered tonnage of ships calling at Mombasa in 1964 was 5.4 million tons, and the corresponding figures for Dar es Salaam, Tanga and Mtwara were respectively 3.6 million, 2.1 million and 0.6 million tons. The differences between these totals are not so great as those between the corresponding totals for cargo traffic movements, since the same ships frequently call at several of the individual ports but tend to land or ship a greater proportion of

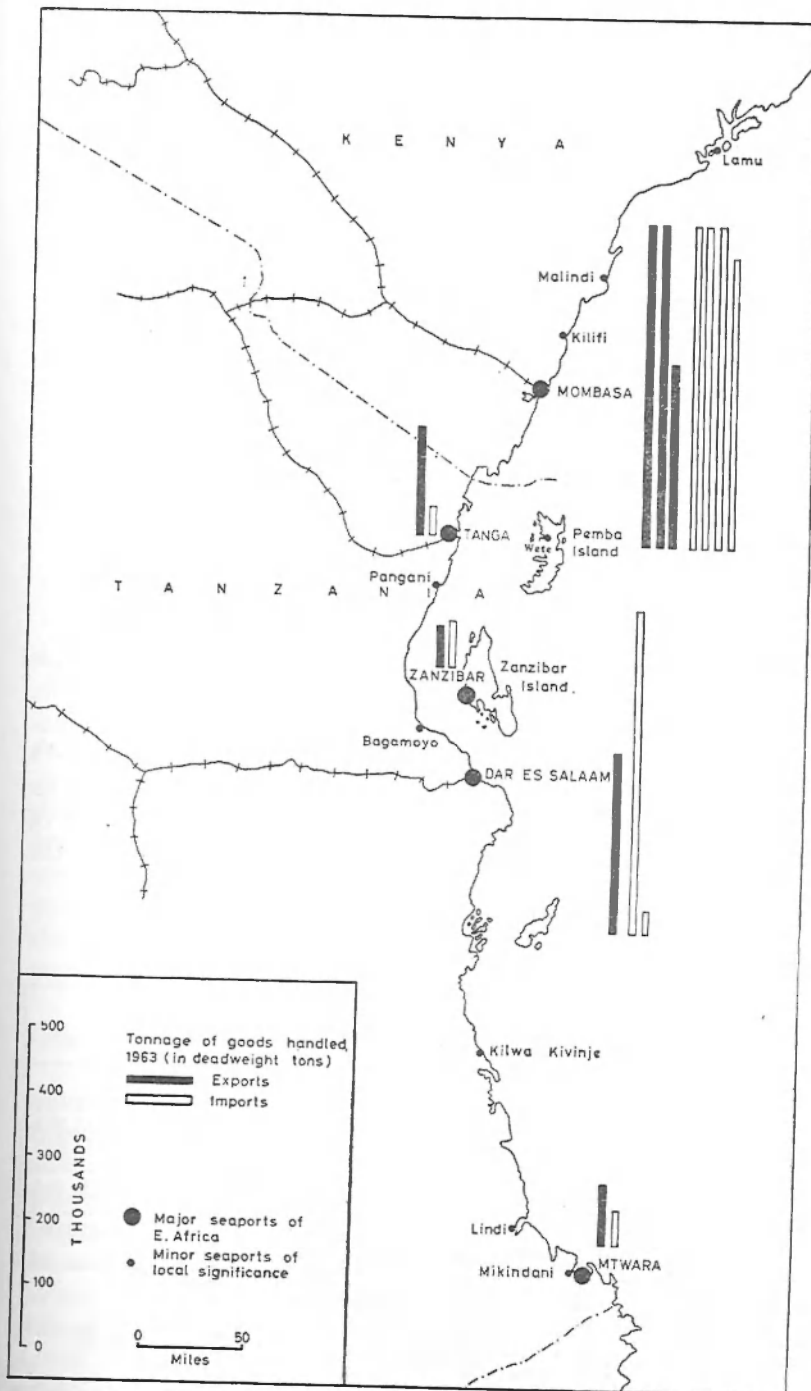


Figure 9. Volume of cargo traffic at the seaports of East Africa, 1963.

Source of statistical data: East African Railways and Harbours Administration Annual Report 1963

their cargo at the larger terminals. At all the major East African ocean terminals except Mtwara a predominant place is occupied by shipping of British registration. This is the outcome of three main factors: British political interest in East Africa, Britain's dominant role in East African trade patterns, and the strength of the British merchant marine on the world seas. Shipping of other European nationalities is also important in East African waters: ships of Dutch, West German, French and Italian registration are all important. Oil tankers comprise much of the Dutch traffic. Although East Africa's long-standing maritime links with Asia are still actively maintained, the absence of internationally significant merchant marine services has not permitted Asian shipping to become strongly represented in East Africa, with the important exception of Japan. American shipping services are quite important at all the East African terminals.

#### The general pattern of cargo traffic

The comparative significance of the four major East African mainland terminals in 1963, in terms of import and export traffic, is shown in Figure 9. The overwhelming predominance of Mombasa is at once obvious, with 70 per cent of the exports and 74 per cent of the total traffic of the port group as a whole. The contrast with Dar es Salaam, which handles only 25 per cent of Mombasa's total, is particularly important, for it emphasizes the

TABLE 10  
CARGO HANDLED AT MAJOR EAST AFRICAN MAINLAND SEAPORTS IN 1963

	<i>Mombasa</i>	<i>Dar es Salaam</i>	<i>Tanga</i>	<i>Mtwara</i>	<i>Total</i>
Imports					
dry cargo	645,637	282,599	27,429	16,856	972,521
bulk oils	1,305,583	253,609	15,156	7,946	1,582,294
total imports	1,951,220	536,208	42,585	24,802	2,554,815
Exports	1,284,903	279,737	168,047	92,227	1,824,914
Total <sup>1</sup> ..	3,253,636	821,461	210,986	117,906	4,403,989

1. Totals include goods in transshipment.  
All figures in deadweight tons.

Source: E.A.R. & H. *Annual report, 1963* (Nairobi, 1964), p. 63.

disparity between the facilities at the two ports and in the extent of development in their respective hinterlands. Nevertheless, the two major terminals taken together contrast even more strikingly

with the smaller seaports of Tanga and Mtwara, where the total traffic handled constitutes respectively only 6 and 4 per cent of that dealt with at Mombasa. In the case of Mombasa, and to a lesser extent in the case of Dar es Salaam, these figures reflect a relatively advanced level of development within an extensive hinterland. In the case of Tanga the low level of traffic handled is directly related to the location of the port mid-way between the two major terminals; this circumstance, together with Tanga's relatively poor facilities, has prevented extensive hinterland growth. The small amount of traffic handled at Mtwara is certainly not a reflection of an inadequate harbour but rather of the low level of economic development in the hinterland and the consequent lack of demand for a better-equipped port at the present time.

Another feature of general interest is the fact that at the two major terminals imports far exceed exports in terms of weight. This is chiefly a reflection of the large quantities of petroleum products imported in bulk at these ports. If these products are disregarded, imports and exports are almost equally balanced at Dar es Salaam, but at Mombasa exports exceed dry cargo imports by approximately 100 per cent. A different pattern is seen at the two smaller ports, where the tonnages of oil products imported are much smaller and where exports outweigh imports by a wide margin. This pattern reflects the fact that the primary function of both these ports is the export of a single primary product from the immediate hinterland, an area which does not constitute in either case a very important market for imported goods.

#### **Export cargo traffic**

Table 11 shows the principal export commodities passing through Mombasa in terms of volume and value. Although considerable variations have occurred over the years in respect of individual commodities, the principal exports are clearly divisible into two types: agricultural primary products and semi-manufactured raw materials. In the first group cotton and coffee are the most important; cotton was outstanding as Mombasa's principal export item from 1954-59, but since 1960 coffee exports have exceeded those of cotton. Stimulated by high world market prices, coffee cultivation increased rapidly in East Africa in the 1950's, but in present circumstances, when world coffee prices have fallen sharply and over-production is a problem, it is unlikely that coffee exports through Mombasa will see further

sharp rises in the near future. Thus in the case of coffee the world market exerts a firmer control over exports than do hinterland factors. In 1964, for the first time, cement exports took first place at Mombasa in terms of weight; derived entirely from the Bamburi factory a few miles north of the port, cement is exported in bags from Kilindini and in bulk with the aid of special loading facilities in the Old Harbour. Soda ash is another heavy item of export at Mombasa, and of much longer standing than cement, having been exported in quantity as early as 1913; used mainly in glass manufacture, exports of soda ash are strongly regulated by overseas demand, and it is unlikely that exports will rise sharply unless the demand from foreign markets shows any marked increase. Exports of sisal have shown a gradual steady increase at Mombasa over the past decade, and this may well continue. In contrast, exports of grains vary between wide limits from year to year, as a result of the official policy directed towards the production of a surplus of maize for export sufficient to provide a safety margin against seasonal fluctuations in home

TABLE II  
MOMBASA: VOLUME AND VALUE OF PRINCIPAL COMMODITIES EXPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>	<i>£'000</i>
Coffee .. .. .	233,729	41,630
Cement .. .. .	170,221	490
Cotton .. .. .	153,580	16,050
Soda ash .. .. .	107,002	1,230
Grains .. .. .	106,239	1,800
Sisal .. .. .	103,149	7,180
Oil seed cake .. .. .	60,170	900
Tea .. .. .	59,438	7,706
Beans .. .. .	29,156	1,080
Wattle bark & extract .. .. .	20,674	800
Hides and skins .. .. .	15,986	1,900
Copper .. .. .	15,717	3,980
Castor seed .. .. .	15,705	670

*Note:* The table shows all items exported through Mombasa in 1963 exceeding 12,000 tons or £1m. Coffee exports from areas outside East Africa are not included.

*Source:* Volume statistics from E.A.R. & H. *Annual report 1963* (Nairobi, 1964), p. 62. Values based on correlation of volume data and East African Customs and Excise *Annual trade report for the year 1963* (Nairobi, 1964).

production, especially in Kenya where maize is the basic food crop of many people. Substantial quantities become available for

export therefore only in occasional years, and imports are in fact quite frequently necessary. Exports of tea have risen sharply in recent years, and now rank quite firmly amongst the major items passing through the port. This growth is expected to continue, for there has been for some years a healthy relationship between supply and demand on the world tea market, and prices have shown a greater degree of stability than in the case of some other primary commodities. The case for expanding tea production in East Africa, both in terms of estate production and smallholder cultivation, largely rests on the relative efficiency of the industry in East Africa in relation to the major exporting countries elsewhere. Much of the tea industry of East Africa has been established fairly recently, under the influence of the latest technological methods, and market results indicate that the quality of East African tea is high. Further substantial increases in tea exports through Mombasa are therefore likely. Exports of wattle bark and wattle extract have, on the other hand, declined as a result of the gradual replacement of wattle by other cash crops, by mixed farming and by settlements in the central area of Kenya during and since the Emergency of 1952-60, and of unfavourable world market conditions. Although measurement by weight is the most important consideration in terms of port working, measurement by value is of wider economic significance, and a comparison of the volume and value of the major export items passing through Mombasa reveals several points of interest. In 1963, for example, the volume of cotton exported was 66 per cent of that of coffee, but in terms of value the proportion was only 38 per cent. Tea, with a high value per unit of weight, takes third place on the list of exports in terms of value compared to eighth place in terms of weight. Copper and canned meat are other commodities taking a much higher place in terms of value than in terms of volume, whereas conversely soda ash and cement reflect their very low value per unit of weight.

Sisal and cotton are the two outstanding exports at Dar es Salaam. Sisal has for many years been the leading export in terms of volume, and since 1959 tonnages in excess of 100,000 harbour tons have been exported each year. Sisal thus constitutes approximately one quarter of the total volume of exports passing through the port, but the commodity is not so important, either in absolute or relative terms, as it is at Tanga. There has been a rapid increase in cotton exports during the past decade, largely attributable to increased acreage under the crop in the Lake Region of Tanzania and to the stimulation provided by high cotton

prices maintained by the Tanzania government by means of a price stabilization fund. Market conditions in the Far East and in Europe are good, and there is likely to be a further increase in cotton exports through Dar es Salaam, but this is likely to be achieved at the cost of continued expansion of acreage rather than by the achievement of higher yields per acre. Increases in cotton exports have been paralleled by increases in exports of oil seed and seed cake, largely a by-product of cotton. Exports of coffee through Dar es Salaam are slight and variable compared with those through Mombasa; this results from the varying quantities moving through Tanzania from Rwanda, Burundi and the Congo, and from the fact that most of the coffee crop from northern Tanzania passes through Mombasa. Grains are occasionally important, as at Mombasa, and hides and skins represent a fairly stable minor export item. Tea exports are increasingly important, and exports of cashew nuts, castor seed and canned meat are also rising. Cotton easily takes first place amongst the commodities exported through Dar es Salaam in respect of value, although the volume of sisal is greater, and the relatively high value of coffee, tea and canned and frozen meat is also noteworthy.

TABLE 12

DAR ES SALAAM: VOLUME AND VALUE OF PRINCIPAL COMMODITIES EXPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>	<i>£'000</i>
Sisal .. .. .	107,391	6,750
Cotton .. .. .	97,793	9,430
Oil seed cake .. .. .	34,609	1,070
Castor seed .. .. .	21,774	980
Cashew nuts .. .. .	15,187	720
Coffee .. .. .	12,021	3,000
Hides and skins .. .. .	9,116	1,060
Groundnuts .. .. .	8,670	560
Tea .. .. .	8,216	1,200
Canned & frozen meat .. .. .	6,134	1,700
Sunflower seed .. .. .	5,284	160
Wattle bark & extract .. .. .	5,015	220

*Note:* The table shows all items exported through Dar es Salaam in 1963 exceeding 5,000 tons or £100,000.

*Source:* Volume statistics based on information provided by the Port Manager, E.A.R. & H., Dar es Salaam. Values based on correlation of volume data and East African Customs and Excise *Annual trade report for the year 1963* (Nairobi, 1964).



The most noteworthy feature of the export traffic of Tanga is that there is only one major commodity involved. Exports of sisal, which rose in 1963 to a record level of 231,105 harbour tons, constituted in that year 88 per cent of the total volume of exports through the port of Tanga and 72 per cent of the total volume of traffic handled at the port. The predominance of sisal exports at Tanga, and their leading role in the export pattern at Dar es Salaam, reflects the fact that sisal constitutes the premier industry of Tanzania, contributing almost 25 per cent of the country's total exports in recent years and accounting for about 10 per cent of the total product of the monetary economy. Exports of sisal have grown gradually since the first shipments took place at the beginning of the century. In 1959 and in 1962-64 exports of sisal through the port of Tanga have exceeded 200,000 harbour tons a year, and the annual rate of increase has risen quite sharply in most recent years, although 1964 showed a slight decline to 219,938 harbour tons. This situation reflects the steadily growing world demand for sisal, which is likely to continue, and also the relatively high prices at present obtainable. The recent sharp upward trend in sisal exports thus represents a policy of cutting and selling as rapidly as possible whilst prices remain high. Although Tanzania still leads the world in sisal production her percentage of the total world output has shown a slight decline over the period 1958-63, chiefly as a result of a notable increase in exports from Brazil. Other commodities exported through Tanga are comparatively of very minor significance, although exports of tea, canned meat and timber have risen in recent years.

At Mtwara the most important item of export is cashew nuts. Exports of this commodity have risen from a level of three to four thousand tons a year, in the period immediately following the opening of Mtwara as an ocean port in 1954, to 44,708 harbour tons in 1962 (declining slightly to 40,907 tons in 1964). To some extent therefore cashew nuts have taken the place which it was expected that groundnuts would take in the structure of port traffic at Mtwara, although the volume of cashew nuts exported has by no means equalled the anticipated level of groundnut traffic which was scheduled to rise to 600,000 tons a year by 1950-51 (see Chapter III). It is arguable that the presence of Mtwara as a deep-water port has done something to encourage the development of cashew nuts as a cash crop, although considerable quantities of cashew nuts continued to move through the older port of Lindi (1955-59: 7,000-11,000 tons annually)

TABLE 13

TANGA: VOLUME AND VALUE OF PRINCIPAL COMMODITIES EXPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>	<i>£'000</i>
Sisal .. .. .	231,105	15,050
Timber .. .. .	5,151	90
Maize & maize meal ..	3,114	50
Tea .. .. .	2,998	352
Wattle bark & extract ..	2,833	150
Oil seed cake .. ..	1,802	30
Canned & frozen meat	1,098	250

*Note:* The table shows all items exported through Tanga in 1963 exceeding 1,000 harbour tons or £50,000.

*Source:* Volume statistics based on information provided by the Port Manager, E.A.R. & H., Tanga. Values based on correlation of volume data and East African Customs and Excise *Annual trade report for the year 1963* (Nairobi, 1964).

until deep-sea ships ceased to use that port in 1962. More important factors in stimulating production, however, have been the suitability of large areas of southern Tanzania for cashew nut cultivation, which does not require good soil and can tolerate dry conditions; and the rising demand for cashew nut products on the world market. The only other export commodities of significance at Mtwara are cassava and sisal. Cassava shipments rose to a record level of 26,816 harbour tons in 1964; sisal was

TABLE 14

MTWARA: VOLUME AND VALUE OF PRINCIPAL COMMODITIES EXPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>	<i>£'000</i>
Cashew nuts .. .. .	36,138	1,530
Cassava .. .. .	19,441	320
Sisal .. .. .	18,651	1,270
Groundnuts .. .. .	3,304	210
Beans and peas .. ..	3,247	260
Timber .. .. .	2,617	50
Coffee .. .. .	1,683	420

*Note:* The table shows all items exported through Mtwara in 1963 exceeding 1,000 harbour tons or £50,000.

*Source:* Volume statistics based on information provided by the Officer in Charge, Southern Region, E.A.R. & H., Mtwara. Values based on correlation of volume data and East African Customs and Excise *Annual trade report for the year 1963* (Nairobi, 1964).

exported from Mtwara during the *primitive* era in the development of the port (see Chapter III), and production from local estates is still of some importance. A total of 18,651 harbour tons of sisal was exported in 1963. The volume of groundnuts exported has never risen above 2,000-3,000 tons a year, and exports of timber (which in the 1950's usually stood at about 10,000 tons a year) declined by 1962 to the level of groundnuts. In 1962-63 a total of 9,927 tons of railway material was shipped from Mtwara, consisting of the lines, sleepers etc. from the Southern Province Railway which ceased to operate in July 1962; most of the material was sent to Mombasa for use on the Northern Uganda railway extension which was in progress at that time.

Monthly variations in the volume of the principal commodities exported through each of the seaports are important, especially because exports consist primarily of agricultural products the cultivation of which is closely related to climatic conditions. The seaward flow of these commodities tends as a result to become concentrated in particular seasons which are sometimes quite sharply defined. If the exporting seasons of several commodities coincide pressure upon port capacity may occur temporarily, whereas at other seasons of the year port facilities may be underworked. At Mombasa there is a double peak in coffee exports in March-April and September-November. The crop is exported through Mombasa from four major areas each with a different peak exporting season. The bulk of the Uganda crop passes through the port in January-April, and this overlaps with the slightly later Kenya crop which is shipped chiefly between February and May. Coffee from Rwanda and from northern Tanzania is exported chiefly towards the end of the year. There is some degree of overlap therefore between coffee-exporting seasons in different parts of East Africa but in fact exports from Mombasa do not often fall below about 10,000 tons in any one month. Variations in monthly tonnages of cotton exported through Mombasa chiefly reflect the Uganda cotton exporting season which runs from January to May. Sisal exports through Tanga and Dar es Salaam do not show variations that are significant in the same respect; changes are attributable largely to market conditions than to circumstances of production. The degree of concentration in particular seasons of the exports of coffee and cotton is however more marked at Dar es Salaam than at Mombasa; coffee exports rise sharply in June and continue at a fairly high level until October, and within this mid-

year period coffee is exported both from Tanzania and from the Congo. Exports of cotton through Dar es Salaam chiefly take place in the period September-January, so that there is an important overlap in September-October as cotton exports rise rapidly before the shipping of the coffee crop is completed. At Mtwara there is the striking phenomenon of an extreme concentration of cashew nut exports in the period November-January which in certain years overlaps with the main cassava exporting season which extends from August to December. During these peak periods, especially as a result of the recent heavy cashew nut crops, port facilities at Mtwara are definitely under considerable pressure; but during the rest of the year, from February to October, the volume of traffic handled is comparatively slight.

#### **Import cargo traffic**

As an element within the structure of the total traffic at a group of seaports such as those of East Africa, the pattern of import cargo traffic is relevant to two main broad considerations: the general level of the economy of the hinterland, chiefly in terms of the purchasing power of the population, and the general nature of the resources of the hinterland, in terms of the degree of dependence upon overseas sources of essential goods. The economies of the East African countries, like those of many developing areas, are fundamentally based upon the production for export of a fairly narrow range of primary raw materials, almost entirely agricultural. Local resources for the development of manufacturing industry are relatively slight, although much progress has already been made in this field. In these circumstances the basic pattern of import cargo traffic at the seaports of East Africa comprises four main elements: fuel and power supplies, industrial products (machinery, transport materials etc.), manufactured goods for the consumer market, and supplementary foodstuffs.

Petroleum products imported in bulk represent by far the most important item in the structure of import traffic at all four major mainland terminals. East Africa seems unfortunately to be completely devoid of significant oil resources, and such coal reserves as are known have yet to be exploited. In spite of considerable developments in the hydro-electric field, East Africa therefore remains heavily dependent upon imports of petroleum and petroleum products. Heavy diesel oils, petrol, kerosene, gas and lubricating oils are all imported in large quantities for inland distribution; and the opening of oil refineries at Mombasa

and Dar es Salaam in 1963-66 has introduced the added element of crude oil imports. At Mombasa, in recent years, the tonnage of

TABLE 15  
MOMBASA: VOLUME OF PRINCIPAL COMMODITIES IMPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>
Fuel oils in bulk .. .. .	704,090
Petroleum in bulk .. .. .	240,887
Kerosene in bulk .. .. .	144,543
Motor vehicles and tractors .. .. .	143,614
Fertilizers .. .. .	61,831
Ironware .. .. .	46,077
Cotton piece goods .. .. .	42,374
Coal in bulk .. .. .	40,260
Salt .. .. .	38,205
Lubricating oil in bulk .. .. .	20,547
G.C.I. sheets .. .. .	17,691
Motor vehicle tyres and tubes .. .. .	16,715
Sugar .. .. .	16,041
Gunnies .. .. .	13,929
Pipes and fittings .. .. .	13,111
Motor vehicle spares and batteries .. .. .	12,132
Railway materials .. .. .	12,028
Bitumen .. .. .	11,410
Malt .. .. .	8,556
Rice .. .. .	8,433
Wines and spirits .. .. .	8,099
Condensed and preserved milk .. .. .	6,779
Agricultural machinery .. .. .	4,500

Source: Based on information provided by the Chief Ports Manager, E.A.R. & H., Mombasa.

TABLE 16  
DAR ES SALAAM: VOLUME OF PRINCIPAL COMMODITIES IMPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>
Bulk oils	
diesel oils .. .. .	128,632
Petrol .. .. .	102,516
kerosene .. .. .	22,054
gas oil .. .. .	11,214
lubricating oil .. .. .	5,149
liquid gas .. .. .	284
total .. .. .	269,849
General cargo .. .. .	243,253
Bulk cement .. .. .	58,461
Vehicles .. .. .	41,678
Railway material .. .. .	17,044
Maize .. .. .	10,085
Sugar .. .. .	8,830
Wheat .. .. .	6,349
Fertilizers .. .. .	4,592
Bitumen .. .. .	3,614
Salt .. .. .	3,584

Source: Based on information provided by the Port Manager, E.A.R. & H., Dar es Salaam.

TABLE 17

TANGA: VOLUME OF PRINCIPAL COMMODITIES IMPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>
Bulk oils .. .. .	15,156
Vehicles .. .. .	5,236
Cement .. .. .	3,564
Fertilizers .. .. .	3,076
Iron and steel .. .. .	3,063
Ghee .. .. .	2,165
Coffee .. .. .	1,660
Salt .. .. .	1,490
Milk .. .. .	1,157

*Source:* Based on information provided by the Port Manager, E.A.R. & H., Tanga.

TABLE 18

MTWARA: VOLUME OF PRINCIPAL COMMODITIES IMPORTED, 1963

<i>Commodity</i>	<i>Harbour tons</i>
Bulk oils .. .. .	7,946
Cement .. .. .	5,737
Gunny bags .. .. .	1,296
Maize meal and flour .. .. .	1,065
Tinned milk .. .. .	809
Rice .. .. .	588
Sugar .. .. .	367
Lubricating oils .. .. .	297
Fertilizers .. .. .	215
Onions and potatoes .. .. .	214
Cigarettes and tobacco .. .. .	213
Maize .. .. .	200

*Source:* Based on information provided by the Officer-in-Charge, E.A.R. & H., Southern Region, Mtwara.

petroleum products imported has exceeded that of all other import cargoes: in 1963, 67 per cent of all imports at Mombasa (excluding transshipment) were comprised of bulk oils. The proportion is much smaller at the other terminals, and reflects the greater degree of concentration of population, wealth and industry in the hinterland of Mombasa than elsewhere. At Dar es Salaam imports of bulk oils are rising more sharply than those of general cargo, and comprised in 1963 some 47 per cent of the total imports. At Tanga the proportion is reduced to 35 per cent and at Mtwara to 32 per cent. These facts may be clearly correlated with the character of the respective hinterlands as described in Chapter 6.

Apart from the predominance of petroleum, varying as it

does between one-third and two-thirds of the total imports at individual ports, no very clear pattern emerges in the structure of import cargo traffic beyond what has already been stated concerning its general nature. Furthermore, information on imports is less easily accessible than details of exports; the E.A.R. & H. Administration is clearly much more interested in the movement of the products of its home area, and records of import commodities are often much less detailed. Tables 15-18 make it quite clear that the range as well as the volume of imported goods is greater at Mombasa than elsewhere. Tanga and Mtwara are, in fact, of very little significance as importing ports.

#### **Passenger traffic**

Emphasis on the structure of cargo traffic at the seaports of East Africa should not be allowed to mask the fact that at all the four terminals of the mainland group passenger traffic is of some significance. The varying amounts of passenger traffic handled re-emphasize the pattern of quantitative relationships between the various terminals which has been illustrated in other respects. Mombasa deals with well over half the total number of passenger movements and the bulk of the remainder passes through Dar es Salaam. Passenger traffic at the smaller ports of Tanga and Mtwara (and Lindi), although never entirely absent, is comparatively slight. Since 1958 there has been a gradual tendency towards a reduction in the number of passengers using the ports, the decline in the number of passengers arriving being more marked than that in the number of those leaving. In 1964, 45,728 passengers disembarked at the four major mainland terminals and 65,619 passengers embarked; of these, 26,048 disembarking passengers and 44,486 embarking passengers passed through Mombasa, and the corresponding figures for Dar es Salaam were 16,659 and 17,530.

#### **Notes and references**

1. Attention is drawn to Appendix A — Statistical Note, in connection with the figures used in this Chapter and in Chapter 6. Except where otherwise stated, statistical data quoted in these chapters are taken from the *Annual reports* of the E.A.R. & H. Administration and from the unpublished records and files of the Administration in Nairobi and at the ports.

## 6

### THE HINTERLANDS OF THE PORTS

#### The concept of the hinterland

The geographical analysis of a seaport or group of seaports is impossible without reference to the concept of the hinterland. Just as the study of a port in chronological isolation may lead to superficiality of treatment, so the examination of a port without reference to its hinterland leads inevitably to a partial and truncated view of reality; for the port cannot exist in geographical isolation since its sole *raison d'être* is to connect together the land and sea transport systems. The broad concept of the hinterland, the land area behind the port which is served by it, has been long familiar, but no very successful attempt has been made to define the term with any precision. This is perhaps understandable in view of the complexity of even the simplest hinterland when analysed in detail, the great differences between the hinterlands of different ports, and the overlapping of one port's hinterland with that of one or more others. A simple parcelling out of the land area behind a series of ports is clearly an inadequate interpretation of the concept of the hinterland, and a more realistic approach is that involving the building up of a composite hinterland from a series of individual commodity hinterlands. Three main factors may be said to influence, in different ways, the hinterland of a port: firstly, the nature of the commodities exported from, or needed by, the hinterland area and which thus pass through the port; secondly, the facilities of the port (i.e. the type and level of traffic that the port is equipped to handle), together with the number and type of vessels regularly using the port; and thirdly, the extent, character and degree of efficiency of the inland surface transport services linked to the port.<sup>1</sup> It is possible to introduce, on the basis of these factors, an elementary distinction between 'primitive' hinterlands, linked with only one port, and 'complex' hinterlands where an inland area has access to two or more ports and where lateral traffic and overlapping of hinterlands both occur. Attention may also be drawn to a further distinction within the 'complex' hinterlands between the 'primary' area firmly within the sphere of influence of a single port, and the 'secondary' area tributary to two or



more terminals, although there can rarely be a sharp break between the two on the ground. Beyond this, port geographers have suggested a host of terms by means of which hinterlands may be further classified, but these appellations generally contribute more to the description of individual hinterlands than to the analysis of the concept in a way that is universally applicable.<sup>2</sup> As suggested above, the variety of hinterlands is so great that any such analysis, other than in the most general terms, is unlikely to be found.

The present analysis of the hinterlands of the seaports of East Africa is based upon the fact, generally accepted, that a port has not one hinterland but a multiplicity of hinterlands. For each individual commodity that a port exports or imports a separate hinterland may be said to exist and, if adequate statistical records are available, it may be analysed in detail. The correlation of all these individual hinterlands then leads to the building up of a broad but nevertheless fairly accurate picture of the composite hinterland of a port. The statistical records maintained by the E.A.R. & H. would permit the development of this method of analysis in the fullest sense, if unlimited resources of time and labour were available. However, a partial but still reasonably accurate analysis of the pattern may be arrived at by directing attention to the outstandingly significant export commodities and to representative import commodities. From the analysis of these individual hinterlands an accurate representation of the bulk of the port's traffic may be arrived at, and the range of minor commodities not dealt with individually may generally be assumed to fall within the pattern thus established. Certain export commodities occupying an important place in the general structure of port traffic in East Africa (e.g. soda ash and cement exports passing through Mombasa) are, however, derived from a single source in the hinterland and thus do not require cartographic analysis of the type used for the major cash crop exports.

#### **Export hinterlands**

##### *(a) The coffee hinterland of Mombasa*

Coffee ranks as the leading commodity exported through the port of Mombasa, and has attained this position partly because it is the only major cash crop produced for export in all the three most important areas that lie within the hinterland of Mombasa: Uganda, northern Tanzania and the highlands of Kenya. Figure 10 attempts to give a quantitative expression to

the coffee hinterland of Mombasa, by indicating the tonnages of coffee railed to Mombasa from individual stations in 1963. The picture that results is not as clear as it might be, since the towns of Kampala, Nairobi and Moshi act as major collecting centres for coffee produced over a considerable area, and the map gives no indication of the extent of the area tributary to each of these centres. Kampala emerges as the most important single point in the coffee hinterland of Mombasa by virtue of the volume of

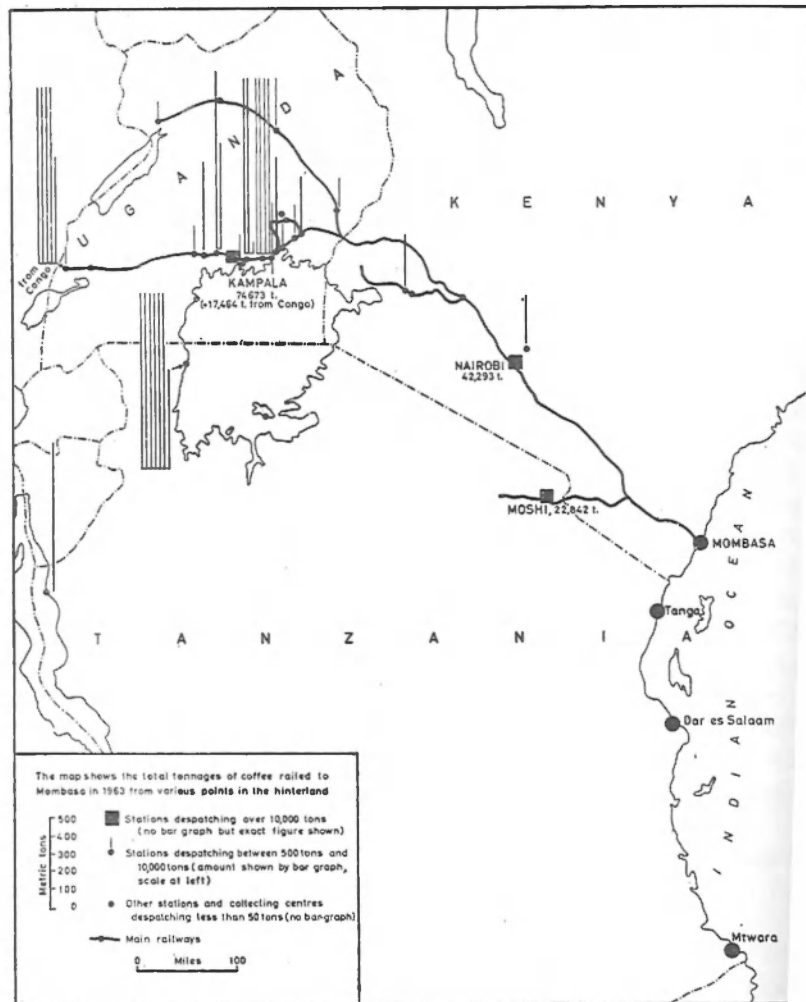


Figure 10. The coffee hinterland of Mombasa  
Based on statistical data obtained from the East African Railways and Harbours Administration.

coffee despatched from that station. Kampala acts as the sole collecting centre for Uganda dry Robusta coffee, which is brought into the Coffee Marketing Board by road from a wide area of southern Uganda. Arabica coffee grown in West Nile, Toro, Ankole and Kigezi is also collected by the Board, but Arabica coffee grown in the Bugisu District of eastern Uganda is collected independently by the Bugisu Co-operative Union. In 1963 a significant amount of coffee of Congolese origin also passed through Kampala, coming in to the capital mainly by road although some was railed through Kasese; this traffic has now entirely ceased. The total amount of coffee despatched from Kampala makes up over one-third of the total exported from Mombasa. Coffee is also despatched coastwards from stations in Uganda — chiefly between Kampala and Tororo — without passing through the capital centre, but on the whole the degree of centralization is fairly strong.

The relative importance of Nairobi as a coffee collecting centre is greater than that of Kampala, although the total volume handled is considerably less. Coffee from both African growers and from estates reaches the Nairobi market almost exclusively by road, and few other stations enter into the picture to give a clearer impression of the extent of the coffee-growing areas of Kenya. The same is true of Moshi, which acts as the principal collecting and despatching centre for the coffee-producing areas of northern Tanzania. The fact that the Moshi area, and the Bukoba area west of Lake Victoria, both lie within the coffee hinterland of Mombasa rather than of Tanzanian ports, is significant; it reflects, in the case of Bukoba, the greater convenience of transport via the lake and the Mombasa railway than via Mwanza to Dar es Salaam, and in the case of Moshi the utilization of a modern deep-water port in preference to a small lighterage port. The export of East African coffee and its distribution on the world market is, moreover, largely controlled through Mombasa, since the coffee exchange established there is the only recognised trade centre for all East African coffees. Coffee auctions are, however, carried out both by the East Africa Hard Coffee Trade Association in Mombasa and by the Mild Coffee Trade Association in Nairobi.

(b) *The cotton hinterland of Mombasa.* The cotton hinterland of Mombasa is much less widespread than the coffee hinterland; although all the three East African mainland countries are again represented, the degree of concentration in Uganda is much more marked in the case of cotton than in the case of coffee.

Cotton remains *par excellence* the export crop of Uganda, in the sense that cotton production in Uganda is not rivalled elsewhere in East Africa; but coffee production has risen rapidly in recent years and has now exceeded the cotton output. The degree of concentration in Uganda is such as to make the representation of the East African pattern of production on a single map somewhat awkward; Figure 11 therefore shows the general pattern, with railings from stations in Kenya and Tanzania indi-

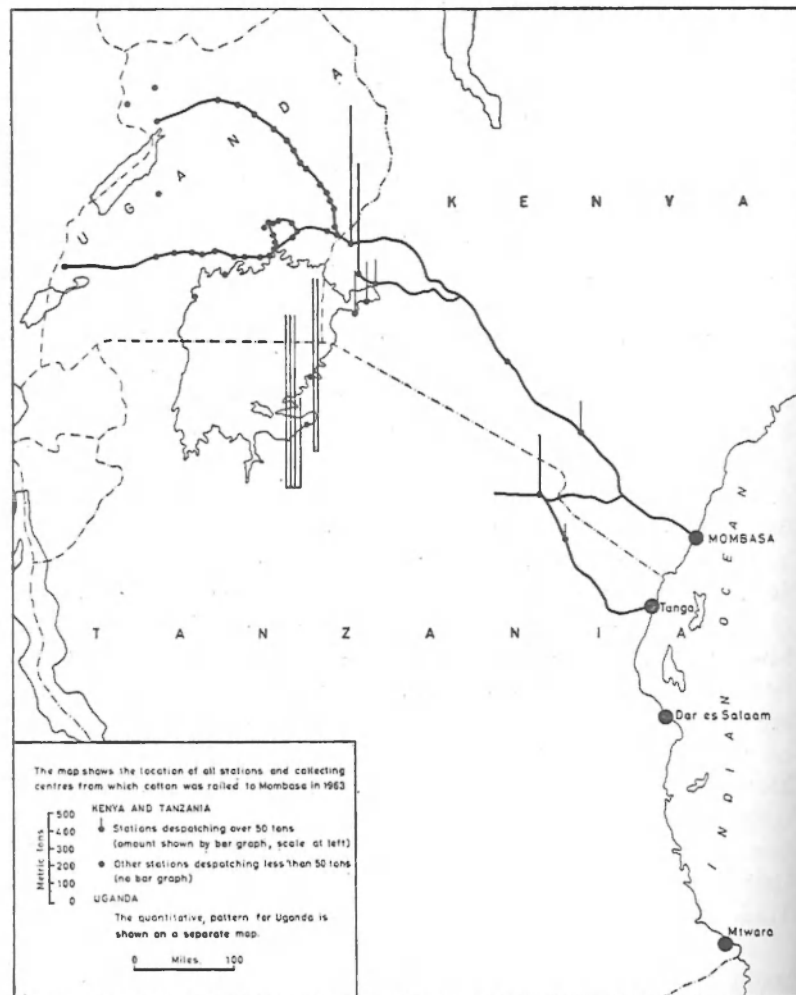


Figure 11. The cotton hinterland of Mombasa  
Based on statistical data obtained from the East African Railways and Harbours Administration.

cated in quantitative terms, but with stations in Uganda shown only by a qualitative symbol, and in Figure 12 a quantitative elaboration of the Uganda pattern is presented on an enlarged base map.

The marketing and despatch of cotton is less centralized than that of coffee, although carefully controlled by the Lint and Seed Marketing Boards. Thus the railings to Mombasa from individual stations present a more accurate picture of the pattern of the cotton hinterland of the port than in the case of coffee. Within Uganda, production is markedly concentrated in the

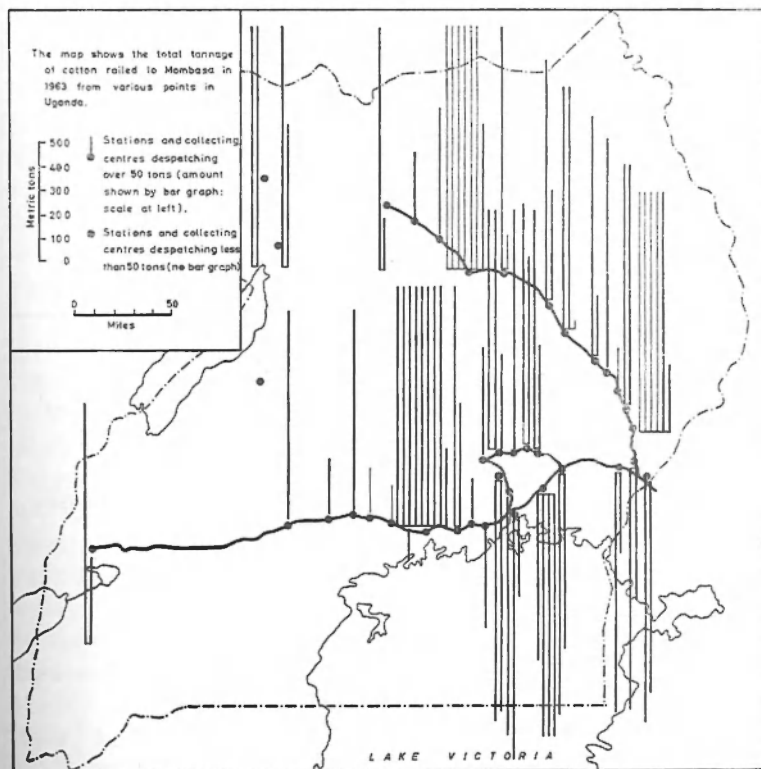


Figure 12. The cotton hinterland of Mombasa: Uganda  
Based on statistical data obtained from the East African Railways and Harbours Administration.

eastern half of the country, the traditional major cotton-growing zones being in Buganda and in the Eastern and Northern Regions. Some expansion of cotton production has taken place in the east and north in recent years as the coffee output has grown

in Buganda. The opening of the northern railway line beyond Soroti to Lira (1962) and Gulu (1963) has been principally significant as a more satisfactory means of transporting the cotton crop of northern Uganda towards the coast than the earlier lake steamer services, now withdrawn. The prolongation of this line to Pakwach (1964) and its proposed continuation into West Nile District is important in the same respect.

Kenya constitutes an almost negligible component in the cotton hinterland of Mombasa. Production is important in the

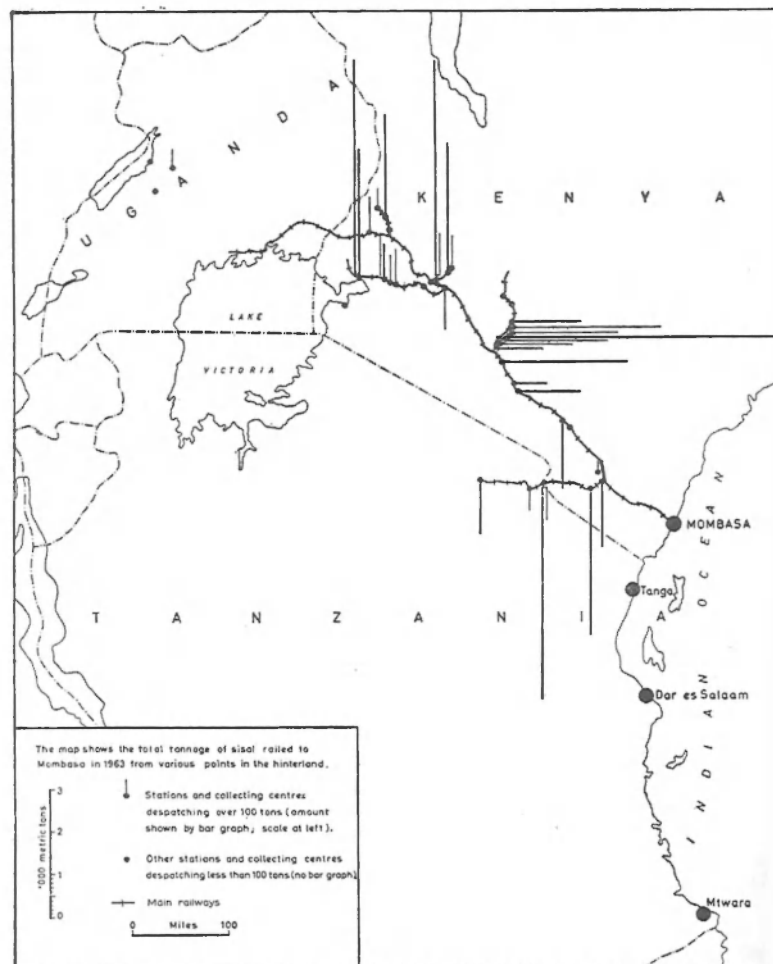


Figure 13. The sisal hinterland of Mombasa  
Based on statistical data obtained from the East African Railways and Harbours Administration.

Western Region, around the shores of Kavirondo Gulf, and a small amount is grown in the dry eastern areas in the vicinity of Kibwezi. The hinterland extends, however, as with coffee, to parts of Tanzania; some cotton is despatched to Mombasa from the Moshi area and, more significantly, from Tanzanian ports on the south-eastern shores of Lake Victoria.

(c) *The sisal hinterland of Mombasa.* Sisal ranks high amongst the principal cash-crop exports passing through Mombasa, and an analysis of the hinterland in terms of sisal (Fig. 13) reveals an interesting pattern that contrasts forcibly with the patterns established for coffee and cotton. Since sisal is a crop characteristically associated with the drier parts of East Africa, its cultivation is very limited in Uganda, which is in any case rather too far from the coast to permit the economic exportation of so heavy a crop. Production is, however, significant in several parts of Kenya, notably in the drier parts of Nyanza Province and in the Thika area north of Nairobi. Production in the dry zone between Nairobi and Mombasa is limited, as is the volume despatched from the Moshi-Arusha area of Tanzania.

(d) *The tea hinterland of Mombasa.* The inland sources of tea exported through Mombasa are less numerous than those of sisal, although both the volume of tea exported and the extent of the tea hinterland are increasing. The most important single source within the hinterland is the Kericho area of western Kenya, where highly suitable conditions of altitude, temperature and rainfall have encouraged the establishment of a major tea industry on an estate basis.<sup>3</sup> Tea production in other parts of western Kenya is much less significant (Fig. 14). Tea production in Uganda does not exhibit the same degree of concentration. A number of estates are found in southern Buganda between Mityana and Jinja, and production in the Fort Portal area of western Uganda is also important. Tea production could be extended to several other parts of western Uganda where suitable conditions are found; production in Kigezi and in Ankole, for example, is now bringing these areas within the tea hinterland of Mombasa and, unlike sisal, the crop can easily bear the cost of long-distance transport to the exporting port.<sup>4</sup> In the past a certain amount of tea of Congo origin has also entered into the picture, being railed to Mombasa either from Kasese or from Kampala.<sup>5</sup>

(e) *The sisal hinterland of Dar es Salaam.* Although sisal ranks as the leading export commodity passing through Dar es

Salaam, the source area of this commodity is largely restricted to a relatively small area within a radius of less than two

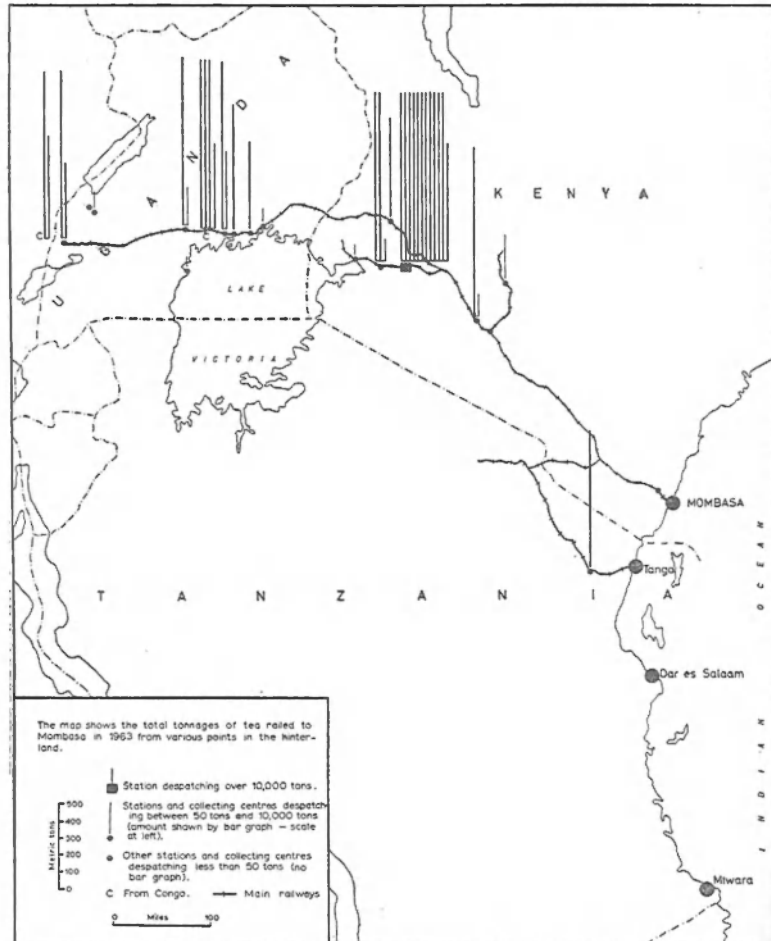


Figure 14. The tea hinterland of Mombasa

Based on statistical data obtained from the East African Railways and Harbours Administration.

hundred miles from the port (Fig. 15). This is not so much a reflection of the particular suitability of this zone for sisal cultivation, for the crop requirements of sisal are minimal and are fulfilled over a wide area of Tanzania, but rather of the bulky nature of the crop which encourages cultivation as near as possible to the exporting port so as to reduce heavy transport costs as much as possible. Large amounts of capital are required to establish the industry on an economic footing, and this has en-



couraged concentration of production on an estate basis rather than its dispersal amongst individual farmers. The core area of the sisal hinterland of Dar es Salaam does not extend far beyond Kilosa and Mikumi, and lies close to the main railway line

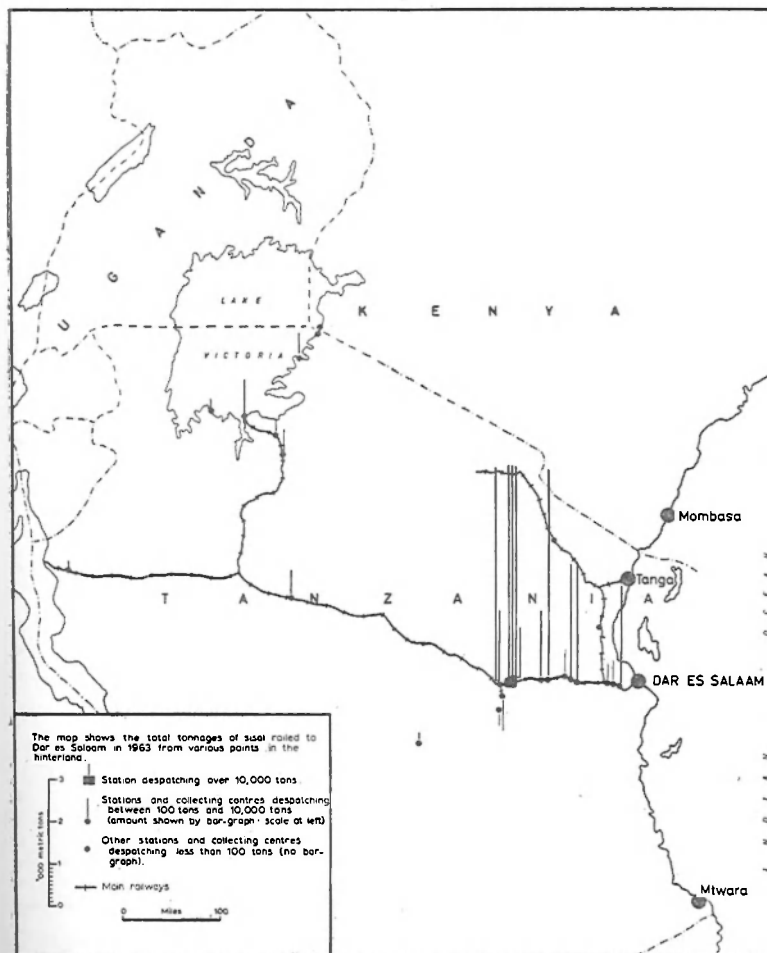


Figure 15. The sisal hinterland of Dar es Salaam

Based on statistical data obtained from the East African Railways and Harbours Administration.

serving the port. Outside this area, sisal passing through Dar es Salaam is derived in small quantities from a number of points, notably in the Mwanza area. Sisal from the Musoma area passes through Dar es Salaam, whereas cotton from the same zone is at times sent through Mombasa.

## THE SEAPORTS OF EAST AFRICA

(f) *The cotton hinterland of Dar es Salaam.* The cotton hinterland of Dar es Salaam is shown in Figure 16. The pattern exhibited is the reverse of that for sisal, the most significant area of production being the Lake Region south of Mwanza, whereas the main sisal zone near the port is relatively unimportant for cotton growing. The transport factor is not, clearly,

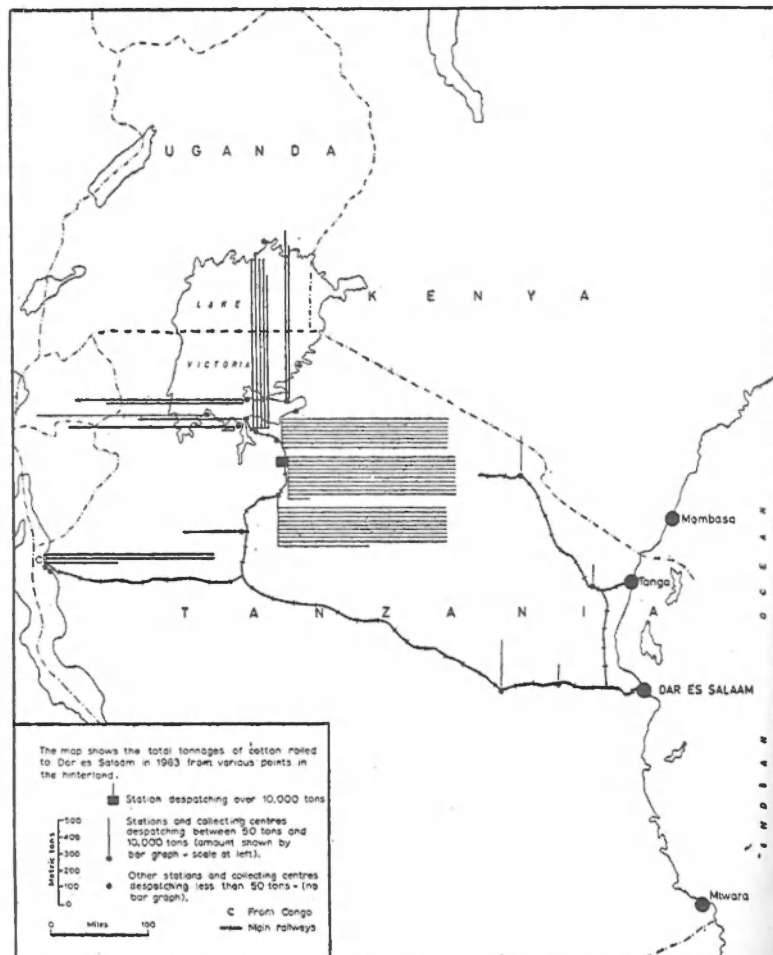


Figure 16. The cotton hinterland of Dar es Salaam  
Based on statistical data obtained from the East African Railways and Harbours Administration.

a very significant one in the economy of cotton production for export in East Africa, since in the case of both the cotton hinterlands of Mombasa and Dar es Salaam the core areas lie towards

the north-western extremities of the respective rail links. Cotton production in the Mwanza area extends around the lake shore and is important on some of the islands in the southern part of Lake Victoria; the most significant areas of production lie, however, inland, to the south of the lake and in the zone served by the northern half of the Mwanza-Tabora railway. A small amount of cotton reaches Dar es Salaam from the Congo, via Kigoma, from the Moshi area and from the locality of Morogoro.

(g) *The sisal hinterland of Tanga.* Of the various cash crop hinterlands of the seaports of East Africa, the sisal hinterland of

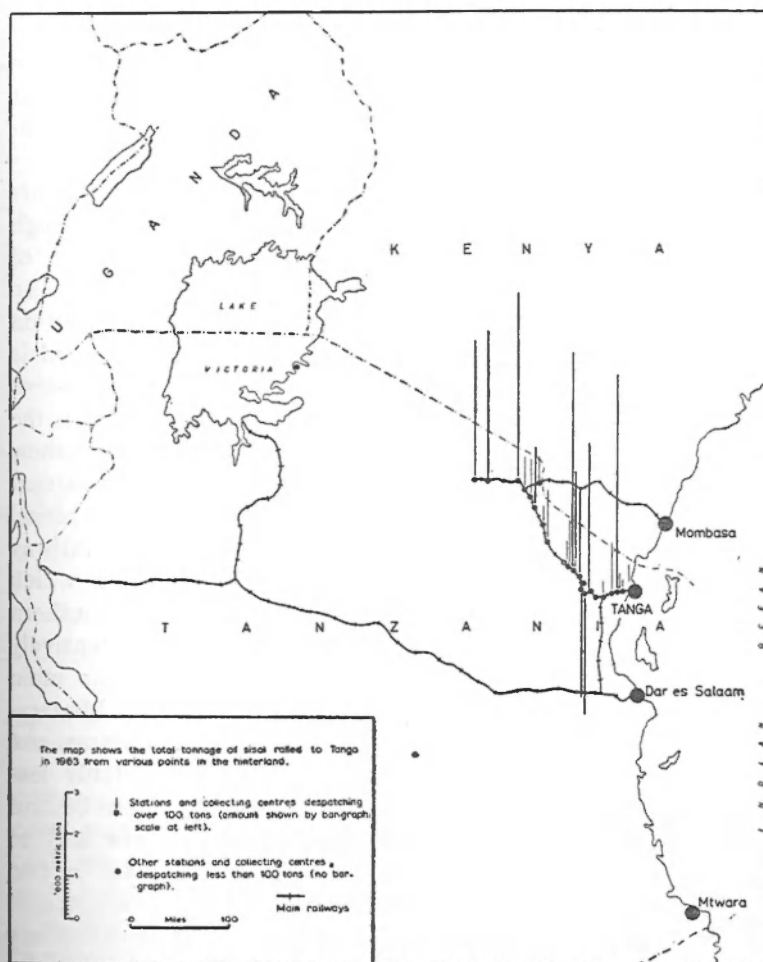


Figure 17. The sisal hinterland of Tanga

Based on statistical data obtained from the East African Railways and Harbours Administration.

Tanga (Fig. 17) is one of the most restricted, at least in the sense that it is confined to an area within relatively close proximity to the coast. Although other cash crop hinterlands are areally restricted, in most cases they lie some considerable distance inland. Sisal is the only commodity handled in large quantities at Tanga, and the sisal hinterland may be taken to represent at least the core area of the hinterland of the port as a whole. Reference to Figure 17 will show that the sisal hinterland of Tanga is fairly precisely confined to the area served by the Tanga railway which extends as far as Arusha; the hinterland does not extend outside Tanzania, but production is fairly evenly distributed through this zone, showing a slight tendency towards concentration in, if anywhere, the Korogwe-Mkomazi zone.<sup>6</sup> The pattern emphasizes, as in the case of the sisal hinterland of Dar es Salaam, the importance of proximity to the coast for commercial sisal production.

(h) *The cashew nut hinterland of Mtwara.* Cashew nuts constitute the only really important commodity exported through the port of Mtwara. Figure 18 attempts to show the extent of the cashew nut hinterland of the port, and since there is now no railway linking Mtwara with its hinterland the map is drawn on a different basis from Figures 10-17. Since the area involved is so restricted, the map is confined to a small part of south-eastern Tanzania; all cashew nut markets in the area are marked on the map and a quantitative symbol indicates the volume of cashew nuts exported through the port of Mtwara from each market during the 1962-63 season. The map thus represents the period immediately following the closure and removal of the railway from Mtwara to Nachingwea and Masasi, the period in which Mtwara emerged as the only deep-sea terminal in southern Tanzania. Although cashew nuts are grown quite extensively northwards along the coast, the map indicates that the main focus of cultivation lies in the Newala area, on the main Mtwara-Masasi road near to the Mozambique border. Beyond Masasi and Nachingwea the incidence of cashew markets is notably less marked, although cultivation continues sporadically even beyond Tunduru. The relationship of the cashew nut hinterland of Mtwara to the road network of the area is important in two further ways. Firstly, the present road system is inadequate, and funds are urgently needed for improvements including extensions to areas that are potentially productive but at present virtually inaccessible. In the 1963-64 season a heavy strain was placed on the road system when a record crop of 43,000 tons of cashew

nuts was shipped and when unusually heavy rains occurred in November. Secondly, the marketing pattern of cashew and other export crops in the area has traditionally been closely geared to the road system and to the coastal port of Lindi, so that the impact of the new facilities provided by the railway in 1949-62 was

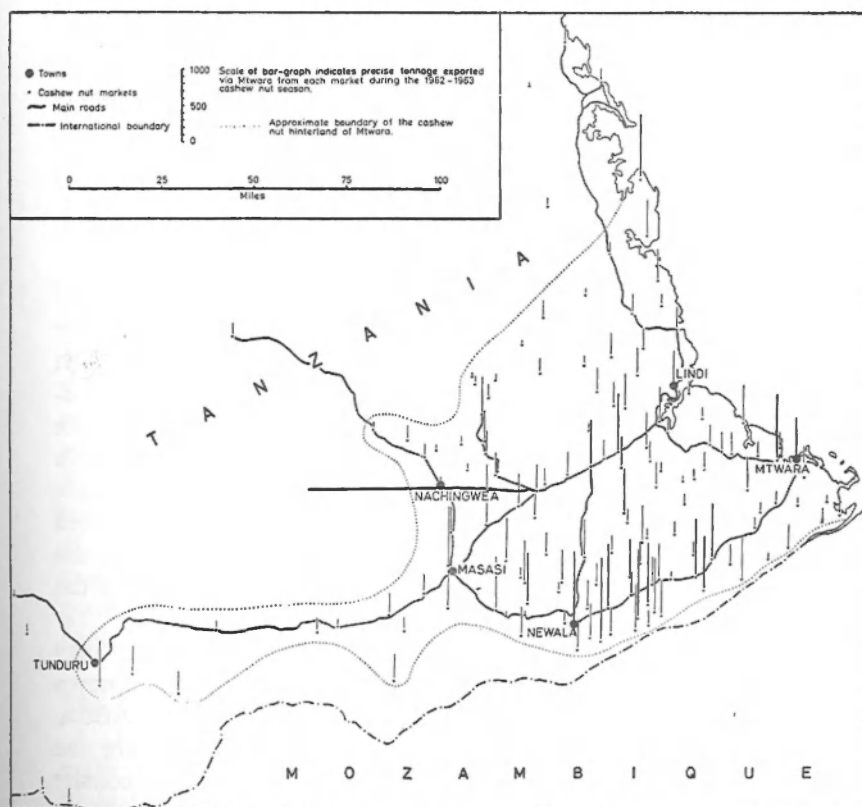


Figure 18. The cashew nut hinterland of Mtwara

Based on statistical data supplied by the Regional Agricultural Officer, Mtwara Region.

comparatively slight. The opening of the railway coincided, moreover, with a period of road improvement, and road transport for both exports and imports through Mtwara has generally been more convenient and sometimes cheaper than rail. The poverty of the hinterland of Mtwara is a considerable problem, and "there is reason to suppose that a more fundamental cause of the lack of development around the railway is the fact that it did not offer any real attraction to agricultural or business enterprise, and that no development was likely unless the government took action

to exploit the opportunities it provided. Inadequate transport facilities may not in fact be the main problem in this area, and if this is the case their improvement could not be expected to stimulate new development".<sup>7</sup>

#### **Import hinterlands**

Attention was drawn in Chapter 5 to the fact that at the two major East African ocean terminals imports exceed exports in terms of weight, as a result of the large quantities of oil and oil products imported in bulk at these ports. However, dry-cargo exports exceed imports at Mombasa, as at Tanga and Mtwara, by a considerable margin; whereas at Dar es Salaam there is a rough balance between exports and imports. The export commodities constitute, in general terms, the key to the hinterlands, partly because they are usually more important than imports (if oil and oil products are excepted), but mainly because it is chiefly to the source areas of the main exports that most of the import commodities are directed. An important distinction between imports and exports is, however, that whereas exports originate largely from a series of core areas that are to a considerable extent mutually exclusive, as has been shown, a representative proportion of most of the imported commodities is distributed to almost all populated parts of the hinterland of each port, the proportion varying with the density and purchasing power of the population of each region.

The pattern of distribution of imported commodities may be briefly illustrated by reference to certain selected items known to be characterized by wide dispersion throughout East Africa. Of these commodities the various types of oil products are the most important, and the largest up-country movements consist of petrol, kerosene, and gas and diesel oils. Some 10,000 to 15,000 tons of petrol in tanks are despatched from Mombasa each month, and the equivalent figure for Dar es Salaam is around 3,000 tons. Oil products are received in all parts of the hinterlands where motor vehicles and machinery are found and, indeed, in almost all areas where population is present since kerosene is very widely used for cooking and lighting. Oil products are thus despatched to all stations on the East African railway system, the main concentrations being of course found in the larger towns from which secondary distribution is effected both by road and rail. Nairobi and Kampala, amongst the inland towns, stand out as major consuming areas for oil products of all kinds.

A similar pattern is reflected by the inland distribution of bicycles from the ports. Bicycles form a popular, relatively cheap and almost ubiquitous means of transport amongst the African population of East Africa, in both urban and rural areas. The distribution of bicycles thus extends to almost all parts of the hinterlands, corresponding to the oil products hinterlands and to the export hinterlands. The monthly tonnage of bicycles imported at Mombasa is about 200 to 300; at Dar es Salaam the figure is variable but rarely exceeds 100 tons per month. Other goods having a similar distribution from the ports include cotton cloth and cotton goods, imported at the rate of approximately 500 tons per month at Mombasa and 100 to 200 tons per month at Dar es Salaam. Certain other categories of imports are also of interest in that their inland distribution from the ports shows a pattern which does not parallel the distribution of population alone but also reflects the influence of other factors. One such category is comprised by machinery, agricultural and dairy implements, and tractors. Although the main markets for machinery are naturally found in the towns — the chief industrial centres, apart from the ports themselves, being Nairobi, Jinja and Kampala — the consuming areas for agricultural machinery and tractors are concentrated in the core areas of production of some of the principal export crops. The cultivation of sisal and grain crops, and the processing of coffee, cotton, sisal and tea, all require a considerable degree of mechanization and this is naturally concentrated in the main producing areas.

#### **The composite hinterlands of the seaports of East Africa**

In Figure 19 an attempt is made to summarize some of the main points made above in relation to the individual commodity hinterlands of the seaports of East Africa. On the basis of Figures 10-18, compiled from statistical sources, and of the author's knowledge of East Africa gained from reading and from travel, the map sets out to show the core areas of the cash crop hinterlands of each port. The presentation is necessarily somewhat subjective, but it is thought to be reasonably accurate. In addition to indicating core areas, an attempt has been made to insert boundaries around the composite hinterland of each port; although based largely upon the export hinterlands, these boundaries apply also to the import hinterlands. The boundaries are, of course, by their nature, generalized and arbitrary, but part of their value is that they draw attention to significant areas where hinterland overlapping occurs. These three aspects of the hinter-

lands — core areas, boundaries and overlapping — will each be examined in turn.

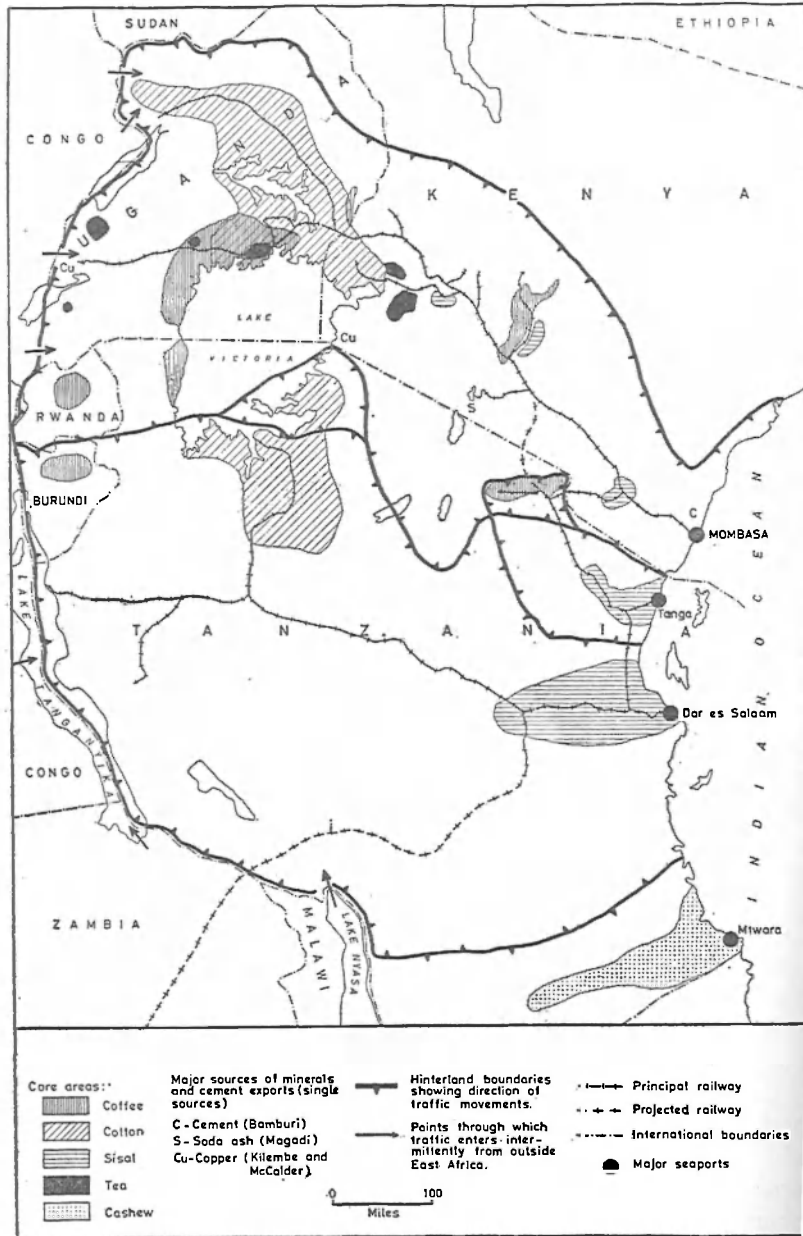


Figure 19. The composite hinterlands of the seaports of East Africa.



A cursory glance at the map reveals at once that the pattern of core areas within the hinterland of Mombasa is far denser than in the case of any of the other three seaports. The hinterland of Mombasa contains core areas for the production of coffee, cotton, sisal and tea, together with all the four East African sources of minerals and cement that are exported in quantity by surface transport.<sup>8</sup> In terms of area there is a strong emphasis on Uganda; but production of cash crops in the highlands of Kenya is intensive and it is mainly from this area that a wide variety of other export commodities is obtained, although none is so outstandingly significant as to compare with those included on the map. The hinterland of Dar es Salaam affords a striking contrast, since it contains only two core areas; sisal in the Dar es Salaam-Kilosa zone and cotton in the Lake Region around Mwanza. Also, in contrast to the Uganda section of Mombasa's hinterland, the hinterland of Dar es Salaam affords no examples of the overlapping of core areas. In the case of Tanga the core area of sisal production close to the port is most significant, but the port has some share also in the coffee core area of the Moshi-Arusha zone. The hinterland of Mtwara compares in size with that of Tanga, but the cashew nut core area is somewhat larger than the sisal core area of Tanga; the contrast in the traffic levels between the two ports reflects the greater weight of the sisal crop and also a variation in the intensity of production as between the two core areas.

No definitive boundary delimits the hinterlands of the East African port group as a whole. Nevertheless, in northern and western Uganda, and in western and southern Tanzania, the political boundaries of these countries set a general limit across which only small amounts of traffic reach the ports at irregular intervals. Very little traffic of any description passes between Mombasa and the southern Sudan, for example; and although, in the south, trade across the Tanzania-Zambia frontier is increasing (and may accelerate quite sharply if the proposed rail link is established) the total involved is as yet very slight. The most important element in the extra-national hinterlands of the East African seaports is undoubtedly traffic from Congo, Rwanda and Burundi; this passes through Dar es Salaam, and in the past has also moved through Mombasa, and consists largely of coffee exports. A considerable area of the eastern Congo lies well within the potential hinterland of the two major East African terminals, each of which has rail links penetrating almost to the Congo border, but traffic to and from this area through Mom-

basa has now virtually ceased and that through Dar es Salaam has shown marked fluctuations. Moreover, reliable information on traffic between non-East African areas and the seaports of East Africa is extremely difficult to obtain. Certain points of entry through which traffic passes intermittently across the general hinterland boundaries are indicated in Figure 19.

Within East Africa the southern boundary of the hinterland of Dar es Salaam is partly defined by the extent of the hinterland of Mtwara. In the north there exists a broad zone stretching over north-eastern Uganda and northern and eastern Kenya which is the source and destination of only negligible traffic movements and so hardly qualifies for inclusion within the hinterland of Mombasa as properly defined. The most interesting part of the hinterland lies in the central area where, as the map shows, a certain degree of complexity arises as a result of the phenomenon of hinterland overlapping. The basic feature of note is that the hinterland of Mombasa extends considerably into the northern part of Tanzania, and in two areas this results in a degree of overlap with the hinterlands of Tanzanian ports. There are three areas of special interest in this central zone. Firstly, the north-western corner of Tanzania, lying between the western shores of Lake Victoria and the Rwanda border, is an important coffee-producing area and lies within the hinterland of Mombasa by reason of the convenience of transporting coffee exports through the port of Bukoba, across the lake to Kisumu and thence to Mombasa, rather than via Mwanza to Dar es Salaam. Secondly, much of the cotton crop from the south-eastern coastlands of Lake Victoria is exported via Kisumu and Mombasa rather than via Dar es Salaam; this has largely in the past been a reflection of the shortage of railway rolling stock on the central Tanzania line during the main cotton exporting season; this overlap may now, however, disappear partly as a result of the building of the Mnyusi-Ruvu rail link and partly for political reasons. Thirdly, the Moshi-Arusha area of north-eastern Tanzania is in many ways orientated economically more strongly towards Kenya than towards central Tanzania, and exports the bulk of its coffee crop through Mombasa rather than through Tanga. This is a result of the superior facilities available at Mombasa and of the concentration there of the control of the coffee trade.

A significant general point in relation to the hinterlands of the seaports of East Africa is that the three larger ports of Mombasa, Tanga and Dar es Salaam are situated relatively close to-

gether, so that their hinterlands are quite narrow at the coast but broaden out considerably inland. Hinterland overlapping occurs partly for this reason — indeed, it is perhaps surprising that the phenomenon is so limited — but a more important cause of the southward penetration of the hinterland of Mombasa into three important areas of northern Tanzania is the existence of superior facilities at the port of Mombasa which far outrank those of the Tanzanian ports, and which are in turn a reflection of the more advanced level of economic development in Kenya and Uganda than in Tanzania. With the possible exception of Mtwara, none of the major seaports of mainland East Africa can claim an exclusive hinterland, with no overlapping, although the greater part of East Africa may be said with some justification to lie within the exclusive hinterland of one of the four chief port outlets.

#### Notes and references

1. A somewhat similar, though simpler, list of factors is given by F. W. Morgan in *Ports and harbours* (London: Hutchinson, 2nd ed., 1958, p. 111). This is elaborated and criticised in G. G. Weigend, 'The problem of hinterland and foreland as illustrated by the port of Hamburg', *Econ. geog.*, 32, 1956, 1-16.
2. J. Mikolajski gives a list of 33 such appellations in his paper 'Polish seaports, their hinterlands and forelands', (*Geographia Polonica*, 2, 1964, 221-29).
3. Kericho does not lie on a railway, although an extension through Kericho to Kisii has often been proposed. Tea railings take place mainly through Lumbwa station.
4. For an account of the expansion of tea cultivation in Uganda see A. M. O'Connor, 'The geography of tea and sugar production in Uganda: some comparisons and contrasts', (*E. Afr. geogr. rev.*, 3, 1965, 27-35).
5. The consignment of tea from Korogwe (Tanzania) to Mombasa, shown on Figure 14, is unusual and may represent either a consignment for a special purpose or a statistical error.
6. The isolated consignment of sisal from Musoma is of no general significance.
7. A. M. O'Connor, 'New railway construction and the pattern of economic development in East Africa', (*Trans. I.B.G.*, 36, 1965, p. 25). For a general account of the cashew nut industry of southern Tanzania see P. J. Northwood, 'Cashew production in the southern province of Tanganyika', (*E. Afr. agr. for. journ.*, 28, 1962, 35-39).
8. Diamonds are exported by air from Tanzania.

## THE PORT OF ZANZIBAR

The port of Zanzibar forms the subject of a separate chapter for several reasons. Firstly, the situation of the port involves physical separation from the East African mainland, and Zanzibar therefore does not share in the wide hinterlands and extensive transport links of the mainland seaports. Secondly, the nineteenth century predominance of Zanzibar was followed by decline as the mainland ports rose to prominence in the service of their developing hinterlands; Zanzibar now therefore suffers from a considerable degree of isolation from the main currents of East African traffic and trade. Thirdly, the port of Zanzibar does not operate under the authority of the East African Railways and Harbours Administration, since Zanzibar is not a member of the East African Common Services Organization; as a result, the type and form of material available on Zanzibar is not always strictly comparable with that on the mainland ports. Fourthly, Zanzibar is still, at the time of writing, living in a post-revolutionary era;<sup>1</sup> political developments have had an adverse effect upon the already stagnant economy of Zanzibar, and at the port there has been a deterioration in the level of traffic handled and in cargo security. Whilst this may not be a permanent trend, the pattern of imports at least is not likely to return to normal until the internal security situation in Zanzibar is considerably improved. The year 1963 is thus the most recent year for which statistics may be regarded as normal, and the account of port traffic given below refers mainly to the pre-revolutionary era.

In terms of organization and administration the principal difference between the port of Zanzibar and the mainland ports is that whereas on the mainland the E.A.R. & H. is responsible for all aspects of port working, no such central authority exists in Zanzibar. The Port and Marine Department (controlled by a Port Officer responsible to the Ministry of Communications, Works and Power) is responsible for the pilotage and movement of shipping, the operation of two government steamers, and the recording of dhow traffic. The maintenance of the quays and all shore equipment on the other hand, are the responsibility of the Public

Works Department (of the same Ministry); and the movement of merchandise is controlled by the Customs and Excise Department (of the Ministry of Finance), and is carried out by the Zanzibar Wharfage Company.<sup>2</sup> The division of port operation and maintenance between four separate organizations has obvious disadvantages, but given the fact that Zanzibar is a small port where pressure on facilities occurs only rarely, the system seems to work satisfactorily.

### Situation

Several of the factors that have influenced the growth of the mainland seaports of East Africa have also been involved in the general situation of the port of Zanzibar; but, because of Zanzibar's insular location, the various factors outlined in Chapter II have been significant in rather different ways. Firstly, the fortunes of Zanzibar have been more closely geared to the wind régime of the western Indian Ocean than have those of the mainland ports; the nineteenth century period of Zanzibar's predominance was a period when most of the shipping using the port still moved under sail, whereas the twentieth century growth of the mainland seaports had taken place within the era of steam propulsion. Secondly, in relation to communications in the interior of East Africa, Zanzibar occupied a fortunate position in the nineteenth century; utilizing small mainland outports, principally Bagamoyo, Zanzibar stood for a time as the eastern terminus and controlling-point of a series of inland trade routes, at least one of which is perpetuated by present-day railway lines. With the coming of the railways, however, Zanzibar was placed at a distinct disadvantage and was no longer able to maintain its dominant position. The economic development of the interior has further tended to emphasize the growth of the mainland ports, so that Zanzibar, with its comparatively minute hinterland, has shown a steady relative decline in the present century. The political subdivision of mainland East Africa furthermore reduced the once intensive (although undemarcated) domains of the Arab Sultans to nothing more than the offshore islands, so that after the 1964 revolution political union with Tanganyika remained the only logical course. The circumstances of situation which so favoured Zanzibar in the nineteenth century no longer apply, and the predominance of the port at that time was a result of Seyyid Said's aptitude in taking advantage of a transitional period that was by its nature bound to be short-lived. Many of the circumstances which actively encouraged the growth of Zanzibar in the

nineteenth century now actively discourage it, the most important of all being the virtual restriction of the hinterland to the off-shore islands.

Present day circumstances of situation thus militate more strongly against the growth of Zanzibar than against any other major East African seaport, with the possible exception of Mtwara. In the eras prior to the development of railways on the East African mainland, Zanzibar profited from a water situation that was as good as that of any mainland port, and took full advantage of it politically. The coming of the railways linking the mainland seaports with extensive hinterlands enhanced the land situation of these rapidly developing terminals, and nullified the advantage of the water situation of Zanzibar. The only redeeming feature of the situation of Zanzibar today is its considerable strategic value, in relation to East Africa as a whole, a factor which has obviously not escaped those foreign powers that have recently taken an interest in the area. Unfortunately this general pattern of nineteenth-century suitability and twentieth-century unsuitability in terms of situation is repeated in the conditions of site.

#### **Site conditions**

The port and town of Zanzibar lie on the western side of Zanzibar Island which is more varied geologically and orographically than the eastern side and, as in the case of Pemba, is more sheltered and better equipped with natural harbours and safe anchorages. Both islands have a core of sedimentary rocks of Miocene-Pliocene age, closely related to similar rocks on the mainland and surrounded by recent reefal limestone which in the case of Zanzibar occupies the whole of the eastern and southern half of the island. Pemba is separated from the mainland by a deep, faulted trough, but the Zanzibar Channel is comparatively shallow.<sup>3</sup>

The water site of the port of Zanzibar is shown in Figure 20. There is no harbour as such, in the sense of an almost enclosed area of sheltered water, as at all the major mainland seaports. Instead, as demarcated on Admiralty Charts, Zanzibar Harbour consists of an area of water sheltered not by promontories but by a number of small islands rising from coastal reefs which form a semi-circle and which ensure that the waters of the harbour are almost always fairly calm. Ships approaching Zanzibar from the north use the English Pass between Chapani Island and the coast of the main island near Mtoni. From the

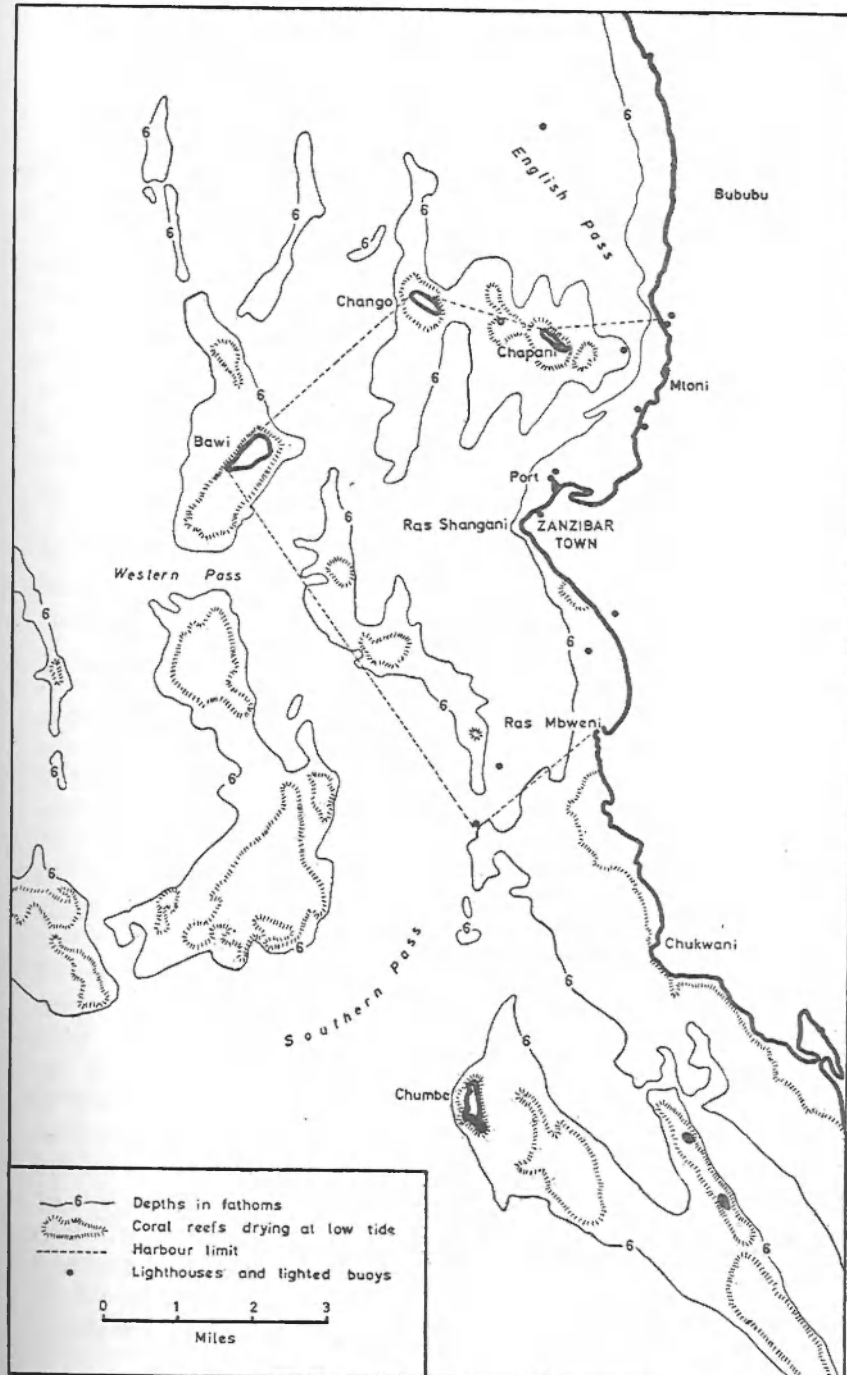


Figure 20. Zanzibar Harbour  
Adapted from Admiralty Chart No. 665.

south entry is made via the broader Southern Pass, and thence through a narrow gap in the reefs south-west of Ras Mbweni. Vessels may also enter from the west through the Western Pass. The navigation of these passes, which are well buoyed and lighted, is not difficult, although pilotage is now compulsory.

The principal feature of the land site of the port of Zanzibar is a triangular promontory culminating in Ras Shangani (Fig. 21). In the early nineteenth century the tip of this promontory was virtually an island, separated from the more easterly parts of the peninsula by a shallow creek but connected at the southern end by a sand bank. This situation is clearly portrayed on a French map, dated 1846, in the Zanzibar Museum. A road across the southern end of the creek was built by Bishop Steere<sup>4</sup> and a German map dated 1882 (also in the Zanzibar Museum) shows a certain amount of infilling at the southern end of the creek. The creek was described in 1928 as "an ill-defined stretch of mud flats only covered with water at H.W.S.T., and . . . the receptacle for every kind of filth pertaining to an Eastern town."<sup>5</sup> In the 1930's the creek was canalized as far north as the Darajani Bridge, and it was filled in, in the 1950's, so that only the part to the north of Hollis Road, known as Funguni Creek, is now covered by water at high tide. The area of the former creek, largely unsuitable for building purposes, still remains an open space effectively separating the former Arab "stone town" on the tip of the peninsula from the African township, constructed of less substantial materials and known generally as Ng'ambo, "the other side".

From the standpoint of navigation and port activity the significance of the promontory occupied by the town is chiefly to be seen in relation to the wind régime of the Indian Ocean. During the north-east monsoon (December-March) the waters off the exposed north-western shore of the promontory become rough, and the sheltered waters south of Ras Shangani were therefore formerly used at this period. Conversely, during the south-west monsoon (June-October) the area of water north of Ras Shangani, lying in the lee of the peninsula, is the more sheltered. During the rainy seasons that occur between the monsoons (March-May and November-December) the sea is generally fairly calm, except during storms. At virtually all times of year, therefore, some part of Zanzibar harbour is able to provide sheltered anchorage. This natural circumstance is an important one which, as will be shown below, has been perpetuated in the construction of the modern port facilities.



### The development of port facilities

When Seyyid Said came to Zanzibar in 1832 and began the development of the port and town, the place which he selected for his activities was extremely well-adapted to his purposes both in terms of local land and water site conditions and in relation to the East African mainland. Moreover, the site was virtually uninhabited except for a small fishing village near the tip of the peninsula, for earlier capitals of the island had been located elsewhere. Until the end of the nineteenth century there were no port facilities in the modern sense, and, as at the mainland seaports in operation at that time, the open beach served quite adequately for the loading and unloading of cargoes during the *dhow traffic* era (Table 19). In the mid-nineteenth century port activity chiefly took place near the tip of the Shangani peninsula, concentrating to the north or south of the point according to season. The name Shangani — ‘the place of beads’ — is perhaps indicative of early trading activity, and it was in this quarter (in the vicinity of the present Kilele Square) that the slave market was originally sited. Movement of cargo over the beach was permitted at many points; the various consulates with water frontages, for example, imported goods over their own beaches since their land titles included foreshore freehold.

From the tip of the Shangani peninsula the focus of port activity at Zanzibar has gradually migrated northwards, although there have been temporary structures on the southern side of the point including a wooden coal jetty used until 1929 and an iron oil pier which was not dismantled until 1956 (Fig. 21). Towards the end of the nineteenth century it became increasingly obvious that port facilities were essential if Zanzibar was not to lose her trade supremacy on the East African coast. In 1892, before any of the mainland ports had moved on from the *dhow traffic* era to the *primitive* era, a small stone-built lighterage quay was completed at Zanzibar a short distance to the north of Ras Shangani,<sup>6</sup> thus representing the beginning of the era of *marginal quay extension* within which the port still remains today. The quay wall, about 800 feet long, was continued north-eastwards as a sea-wall for a further distance of some 950 feet. The new lighterage quay, equipped with a lighthouse and several steam cranes, and backed by covered transit sheds, was generally known as the Customs Quay; the name ‘Forodhani’ (Swahili for ‘Customs’) is still used for the main road along the seafront at this point and for one of the administrative areas of the town. Immediately behind the port area, an eighteenth-century Arab

fort was used partly for Customs purposes, and partly as the main depot and workshops for a railway built in 1906 by an American company from this point to Bububu, a village situated

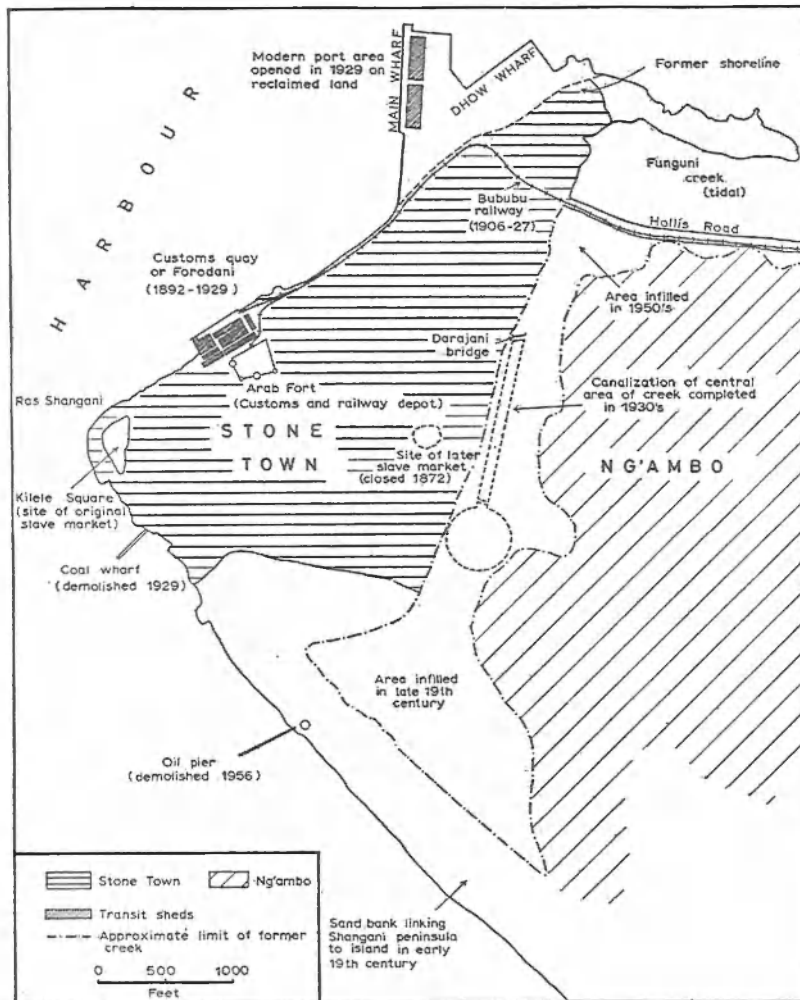


Figure 21. The evolution of port facilities at Zanzibar

near the coast some seven miles north of Zanzibar town. The railway was closed in 1927 as a result of increasing competition from motor traffic.

The Customs Quay proved inadequate, however, due to its restricted land site and its exposure to the north-east monsoon. It was replaced in 1929 by the opening of a completely new port

TABLE 19  
ERAS AND EPOCHS IN THE DEVELOPMENT OF THE PORT OF ZANZIBAR

<i>Era</i>	<i>Terminated by . . .</i>	<i>Present-day symbols</i>
I <i>Dhow traffic</i>	Various early landing steps	Beaches around Shangani Point
II <i>Primitive</i>	Opening of Customs Quay in 1892	
III <i>Marginal quay extension:</i> (a) Customs Quay, 1892-1929 (b) The Wharf, 1929	Opening of new wharf in 1929 —	People's Gardens Present port area

area, an event which may be said to mark the continuation of the era of *marginal quay extension* at Zanzibar on a slightly different site. The need for the development of modern facilities, on a site less restricted than that afforded by the old Customs Quay, had been felt for some years, but progress had been prevented by the first world war. In 1919 a scheme was put forward for the construction of what was originally envisaged as a deepwater pier consisting of a three-berth reinforced concrete pile wharf backed by a reclaimed area of some twenty acres.<sup>7</sup> On the eastern side of the reclaimed area, provision was made for dhow traffic in the form of a sheltered basin with ancillary facilities; it was considered particularly important that transit between the ocean wharf and the dhow wharf should be short and direct, since a large proportion of the imported goods were distributed by sea, and the bulk of those for export were brought in by sea also. This project was approved by the British Secretary of State and in 1920 negotiations were completed between the Government of Zanzibar and the South African Government for the loan of a resident engineer and a European foreman to supervise the carrying out of the harbour improvements.<sup>8</sup> These officials arrived in Zanzibar in May 1920, and a survey was immediately undertaken of the depths and tidal characteristics of the harbour area. The exact bearing on which the new wharf was to be laid down was decided;<sup>9</sup> the significance of the alignment, which is approximately north-south, is that the west-facing quay wall is sheltered by Shangani Point from the south-west monsoon and from the north-east monsoon by the reclaimed port area itself. The triangular reclaimed area of the port thus artificially reproduces, at least in part, the advantageous natural con-

ditions associated with Shangani Point in the *dhow traffic* era. After many financial and practical difficulties the new port developments were opened in 1929, and the Customs Quay fell into disuse.<sup>10</sup>

#### **Port equipment and organization**

Although the 1929 wharf at Zanzibar was originally conceived as a deep-water pier, the port remains essentially a lighterage port since neither the wharf itself nor the dredging alongside were ever completed to the original specifications. The main quay is 823 feet long, and the depth alongside increases seawards to a maximum of about 18 feet. Small coasting vessels may thus be brought alongside, but otherwise the wharf is used for the loading and unloading of lighters. Larger vessels anchor a short distance offshore, where there is adequate space in from seven to ten fathoms of water. The dhow wharf is some 550 feet long and the depth of water alongside rarely exceeds 10 feet. The area of reclaimed land behind the two wharves is occupied by various transit sheds, storage sheds used by the Zanzibar State Trading Corporation, and Public Works Department workshops. The range of cargo-handling appliances is very narrow: cranes capacity totals 13 tons, and there are two diesel tractors and one forklift truck, but no pallets are used because of the small quantities and wide variety of goods handled. The harbour craft comprises 24 lighters with a total capacity of 4,771 harbour tons, three water boats with a total capacity of 720 tons, four tugs and five labour launches. All port workers are employed by the Zanzibar Wharfage Company; together with office and supervisory staff the total labour force includes 442 persons. Although the port of Zanzibar is not very well equipped, either in terms of the level and range of facilities or of the general standard of efficiency of port working, the port is nevertheless able to deal with the type and level of traffic that passes through it with a minimum of delay, so that there is little incentive to improve facilities from this standpoint. The general level of mechanization is extremely low, and some mechanical appliances (e.g. cranes) are badly in need of renewal; transport between quayside, transit shed and warehouse is generally by means of human effort, aided only by the traditional 'hamali' carts, which are elongated four-wheeled trolleys capable of transporting up to a ton load when propelled by four or five men. This method of transport provides employment for a considerable number of people, and it is difficult to see how it could be replaced by a more efficient motorized system be-

cause of the location of many of the traders' warehouses within the 'stone town' where the streets are extremely narrow. In one sense, therefore, the port of Zanzibar is unsatisfactorily equipped in terms of the mechanization and modernization of equipment, but in another sense the port is over-equipped for the handling of the amount of traffic that passes through it, since the level of traffic handled has not yet caught up with the facilities provided in 1929. It is essentially the qualitative rather than the quantitative aspect of port facilities that is lacking; this point is underlined by the fact that it is extremely rare for a vessel to be kept waiting in the harbour before being worked; most vessels (other than dhows) calling at Zanzibar are worked in less than a day, partly because only a small proportion of their cargo is, in most cases, landed or shipped at the port.

#### **The structure of port traffic**

The general pattern of port traffic at Zanzibar is broadly similar to that at the mainland seaports of East Africa, and the particularly marked concentration of the export trade upon a single primary product immediately suggests a close parallel with Tanga. The number and net registered tonnage of ocean-going ships entering the port of Zanzibar has risen in recent years to around 450 vessels and to slightly more than 2 million tons. To these must be added some three thousand coastal and native vessels with a total net registered tonnage of under 200,000 tons; in this category many vessels are recorded numerous times. The volume of ocean-going shipping of the modern type has increased at Zanzibar during and since the 1950's, but this reflects an increasing density of shipping in East African waters rather than growing cargo movements at Zanzibar itself. Separate statistics of the traditional ocean-going dhow traffic are not available in present circumstances, but it is very clear that the dhow trade has declined to almost negligible proportions and that in present political circumstances the ocean-going Arab dhow trade has entirely ceased at Zanzibar and it is unlikely that Indian dhows will continue to visit the port since they have experienced increasing difficulty in selling their cargoes.<sup>11</sup>

Some general aspects of the cargo traffic of the port of Zanzibar are shown in Tables 20-21. The high value per unit of weight of the principal export, cloves, partly explains the fact that the volume of exports is generally lower than that of imports. The total volume of cargo traffic handled at Zanzibar only slightly exceeds that dealt with at Mtwara, the smallest main-

land terminal, but because both Tanga and Mtwara are predominantly exporting ports the volume of imports handled is exceeded in both cases by the volume handled at Zanzibar. However, the predominance of imports at Zanzibar is not as great now as formerly; imports have shown a general tendency to decline during the past decade, whereas exports have remained fairly static. The importation of coal for bunkering purposes used to be quite important, but ceased entirely after 1957; the supply of water to shipping continues to be significant, for Zanzibar has long enjoyed a reputation as the best watering place on the East African coast.

Table 22 shows the volume and value of the principal export commodities passing through the port of Zanzibar in 1963. The products of the clove and coconut trees provided in 1963 96.9 per cent of the total value of the domestic exports of Zanzibar; the clove is the more important of the two, and the reliance which Zanzibar places upon this single predominant item of export is obviously unhealthy from an economic standpoint. Clove plants were probably first introduced into Zanzibar from Mauritius in 1818; on the orders of Seyyid Said much of the best land of Zanzibar and Pemba was planted with cloves, and by the middle of the nineteenth century the industry had become well established. The initial success of the crop was partly due to the use of slave labour, and following the final abolition of slavery

TABLE 20  
TOTAL TONNAGES OF CARGO HANDLED AT THE PORT OF ZANZIBAR, 1951-64  
(in harbour tons)

<i>Year</i>	<i>Exports</i>	<i>Imports</i>	<i>Total</i> <sup>1</sup>	<i>Water</i>
1951 .. .. .	55,298	100,211	155,509	69,422
1952 .. .. .	67,737	99,039	175,034	81,107
1953 .. .. .	46,002	82,832	132,293	81,363
1954 .. .. .	59,361	100,050	161,611	78,118
1955 .. .. .	84,719	132,579	219,298	92,556
1956 .. .. .	76,163	111,358	187,521	79,427
1957 .. .. .	58,187	97,795	156,194	46,320
1958 .. .. .	62,558	83,447	146,005	57,271
1959 .. .. .	58,764	79,270	138,034	97,636
1960 .. .. .	65,950	70,489	136,439	61,367
1961 .. .. .	59,672	79,327	138,999	66,978
1962 .. .. .	62,607	80,396	146,948	66,552
1963 .. .. .	65,546	72,405	139,765	67,360
1964 .. .. .	45,686	54,956	85,959	31,003

1. The totals shown include coal imported for bunkering purposes, but exclude the water supplied to shipping shown separately in the end column.

TABLE 21  
VALUE OF CARGO TRAFFIC AT ZANZIBAR, 1959-63 (AVERAGE)

<i>Imports:</i>				£
Trade imports	..	..		5,085,870
Transhipment	..	..		639,123
Government imports	..	..		252,538
Bullion and specie	..	..		20,914
Total: ..	..	..	..	5,996,445
<i>Exports:</i>				
Domestic exports	..	..		3,920,900
Re-exports	..	..		939,188
Direct transhipment	..	..		637,124
Total: ..	..	..	..	5,497,211
<i>Total Trade:</i>	..	..	..	11,493,656

Source: Zanzibar Government, *Trade report for the year 1963* (Zanzibar: Govt. Printer, 1964), pp. 1, 3.

TABLE 22  
VOLUME AND VALUE OF PRINCIPAL COMMODITIES EXPORTED THROUGH THE PORT OF ZANZIBAR, 1963

<i>Commodity</i>	<i>Harbour tons</i>	<i>Value (£)</i>
Cloves .. .. .	11,206	3,051,992
Copra .. .. .	11,518	622,730
Fibres, unmanufactured .. .. .	5,614	132,775
Clove oil and clove stem oil .. .. .	149	117,524
Coconut oil .. .. .	1,177	102,108
Coconuts .. .. .	3,063	79,327
Oil cake .. .. .	1,529	37,899
Marine shells .. .. .	196	18,665
Chillies .. .. .	89	11,891
Hides .. .. .	41	6,366
Beche de mer .. .. .	23	4,336
Mangrove bark .. .. .	13	4,307
Fibres, manufactured .. .. .	64	4,247
Others .. .. .		84,461
Total domestic exports .. .. .		4,278,638
Re-exports .. .. .		853,375
Direct transhipment .. .. .		765,822
Total exports .. .. .		5,897,835

Source: Based on Zanzibar Government, *Trade report for the year 1963* (Zanzibar, Govt. Printer, 1964), p. 3.

in Zanzibar in 1897 a decline in the standard of cultivation took place in the early years of the present century. Between the two world wars the Government of Zanzibar took an increasing share

in the organization and marketing of the clove crop, and in 1927 the formation of the Clove Growers' Association<sup>12</sup> introduced a measure of price control. A characteristic feature of the clove industry is the very wide variation in production from one seasonal year to another; in a good year the crop may exceed 20,000 tons, and in a bad year may fall below 3,000 tons. This does not however directly affect the pattern of exports, since cloves may be stored for long periods without loss of quality. Storage for several years may cause discoloration, but the oil content remains unimpaired. New cloves are therefore sold as spice, and old cloves on markets where the oil content is the main criterion. Exports do not therefore show such wide annual variations as do yields, and are rather more closely allied to market demand than to home production. A further feature is that the value of clove exports on the world market has varied in the past between quite wide limits, so that for the years 1950-55, for example, there is no close correlation between the volume and value of clove exports. The general pattern, however, is that whereas the volume of clove exports has fluctuated in recent years between 7,500 and 12,000 tons, and the value between £2 million and £4 million, the current overall tendency is one of gradual decline. In 1950 the condition of the clove industry of Zanzibar was described as "not unsatisfactory"<sup>13</sup> in spite of the ravages of "Sudden Death" disease in Zanzibar Island. This statement is hardly true today, partly as a result of the declining demand for cloves in the main market areas, and, more immediately, as a result of the aftermath of the 1964 revolution during which many clove plantations owned by Arabs have been confiscated and have not subsequently been tended with sufficient care.

The coconut industry is the second most important activity in Zanzibar and coconut plantations occupy large areas of land much of which is unsuitable for cloves. The coconut has been described as "the universal provider of the tropics", and with good reason. The dried kernel produces copra, from which is extracted coconut oil for use as food and as a base for the manufacture of margarine and soap, and the residue is made into oil cake. The fibre of the coconut, coir, is exported both in its raw state and in the form of hand-manufactured ropes and matting. These, with other minor products of the coconut, constitute the only really significant exports from Zanzibar apart from cloves. Exports of copra have risen significantly in volume and value in recent years, and although they do not represent more than 25 per cent (1963) of the value of clove exports, the volume of copra



exported has in fact slightly exceeded that of cloves in 1958 and in 1963-64. These increases in copra exports have occurred to some extent at the expense of coconut oil exports which have declined steadily since 1950, reflecting the falling profitability of coconut oil on the world market as compared with copra. Exports of fresh coconuts are important, and although both volume and value have declined since 1960 the volume of coconuts exported has consistently exceeded that of coconut oil since 1958.

The remaining domestic exports of Zanzibar are of relatively small account. Oil cake, manufactured from copra after the extraction of coconut oil, is of some significance (1963: 1,529 tons, value £37,899). Marine shells were exported in 1963 to the value of £18,665, but manufactured coir fibre realized only £4,247. Chillies, hides and skins, beche de mer and mangrove bark are amongst other items of export.

An important aspect of the structure of port traffic at Zanzibar is the re-export trade. This transit traffic has its origins in the nineteenth century when Zanzibar acted as a major emporium for the re-distribution of mainland produce. Re-exports are not now of such relative importance as they were in the early years of the present century; in 1900 they constituted 79 per cent of the total export traffic.<sup>14</sup> In the 1950's there was some increase in re-exports, rising to a total value of £1,338,010 in 1962 (42 per cent of the total exports for that year). The trade is mainly between the East African mainland and south and south-west Asia; and the most important item involved is ivory re-exported to India, Hong Kong and Japan.

Imports generally exceed exports at Zanzibar in terms of both volume and value, and cover a wide range of foodstuffs as well as other consumer goods. Table 23 below lists the principal items imported in 1963 in order of value. In terms of value, rice alone constituted almost 10 per cent of the total imports in 1963, a significant indication of the position of this staple foodstuff in the diet of the people of Zanzibar and Pemba where adequate supplies cannot be grown although firm efforts are currently being made to expand production. Food imports as a whole made up 36.8 per cent of the value of the total imports in 1963; cotton and synthetic fabrics, clothing and footwear etc. constituted 12.6 per cent; and petroleum products accounted for 6.2 per cent. The considerable value of other unspecified items should be noted.

The general pattern of imports thus illustrates from another angle the character of the economy of Zanzibar. The heavy emphasis on food imports reflects the basic orientation of the agri-

TABLE 23

VALUE OF PRINCIPAL COMMODITIES IMPORTED THROUGH THE PORT OF ZANZIBAR  
1963 (with volume statistics where appropriate)

<i>Commodity</i>	<i>Value (£)</i>	<i>Volume</i>
Rice .. .. .	527,650	10,078 tons
Wheatmeal and flour .. .. .	304,749	89,019 "
Sugar .. .. .	276,663	51,906 "
Cotton piece-goods .. .. .	234,942	3,582,875 sq. yds.
Artificial silk piece-goods .. .. .	232,722	3,256,623 "
Electrical machinery etc. .. .. .	175,161	—
Motor spirits .. .. .	164,064	1,414,330 gallons
Wearing apparel .. .. .	161,149	—
Maize flour .. .. .	131,747	40,395 tons
Cigarettes .. .. .	131,714	112 "
Motor cars and lorries .. .. .	101,971	191 "
Beans .. .. .	94,175	2,949 "
Fuel oil .. .. .	81,639	818,411 gallons
Kerosene .. .. .	67,323	675,361 "
Machinery (non-electrical) .. .. .	66,724	—
Wines and beer .. .. .	53,193	101,272 "
Medicine and drugs .. .. .	50,995	—
Jute bags and sacks .. .. .	50,661	557,088
Boots and shoes .. .. .	50,648	332,436 pairs
Tyres and tubes .. .. .	44,737	—
Iron and steel manufactures .. .. .	34,543	543 tons
Cement .. .. .	30,422	3,964 "
Milletts .. .. .	29,622	1,013 tons
Spirits .. .. .	29,095	11,293 gallons
Lubricating oil .. .. .	17,260	59,528 "
Tobacco (manufactured) .. .. .	15,449	23 tons
Wheat .. .. .	13,440	412 "
Bicycles .. .. .	9,896	813 "
Maize .. .. .	586	16 tons
Cotton blankets .. .. .	520	2,540
Foodstuffs (miscellaneous) .. .. .	593,942	—
Other items .. .. .	1,355,286	—
Total items imported by public (including bullion and specie)	5,132,688	—
Government imports .. .. .	247,247	—
Direct transshipment .. .. .	765,822	—
<b>Total imports: .. .. .</b>	<b>6,145,757</b>	<b>—</b>

*Source:* Based on Zanzibar Government, *Trade report for the year 1963* (Zanzibar, Govt. Printer, 1964) pp. 1-2. Volume data, given in the Customs records by a variety of means and sometimes not at all, are here converted to tons as far as possible in order to facilitate comparison.

culture of Zanzibar towards cash-crops; the success of commercial agriculture in Zanzibar in the past has encouraged the neglect of food crops, but present trends are rather in the reverse direction. As a result of the declining clove exports, a new impetus has been given to subsistence crop production. The importance of clothing, fabrics etc. amongst the import commodities and the insignificant place occupied by machinery indicates the virtual absence of industrialization in Zanzibar in any form, apart from

the distillation of clove oil; this in turn reflects, among other things, the small size and low total purchasing power of the population of the islands.

#### **The hinterland**

The concept of the hinterland of a port is expressed in its most simple form by an island served by a single ocean terminal. There is no question of hinterland overlapping, which occurs in some measure in the case of almost all ports serving parts of larger land masses and in cases where small islands are served by several ports. Furthermore, where the traffic of an island port is small, the range of individual commodity hinterlands is accordingly likely to be rather narrow. The interest of this peculiarly simple form of hinterland thus lies largely in the degree of internal differentiation that can be distinguished within the tributary area, and in the nature of the transit traffic handled (to which reference has been made above).

The hinterland of the port of Zanzibar consists simply of the islands of Zanzibar and Pemba; and, since none of the minor ports of these islands engages in overseas trade, the hinterland is exclusively that of the principal port. Geographical variations within the hinterland may, however, be distinguished in terms of the two major export crops, although this can only be done in general terms. It is well known that the bulk of the clove exports are derived from Pemba Island rather than from Zanzibar Island, but the extent to which this is true is perhaps less widely appreciated. Figure 22 attempts an analysis of the relative production of cloves in the two islands in terms of seasonal years from 1934/35 to 1964/65, showing for each year both the volume and the percentage of the total output produced by each island. Pemba Island is shown to produce a proportion of the total output that rarely falls below 75 per cent and is usually between 80 and 90 per cent; Zanzibar Island, conversely, usually contributes between 10 and 20 per cent, rarely rising above 25 per cent. During the period represented these remarkably steady proportions have been upset on only two occasions (1952/53 and 1964/65) when the production in Pemba was particularly low. Generally speaking, the concentration of clove production in Pemba has become more pronounced in recent years; the average share of the total output provided by Pemba in the years 1934/35 to 1951/52 was 78.4 per cent, and for 1953/54 to 1963/64, 84.0 per cent; the Zanzibar proportion between the same two periods has correspondingly declined from 21.6 to 16.0 per cent.

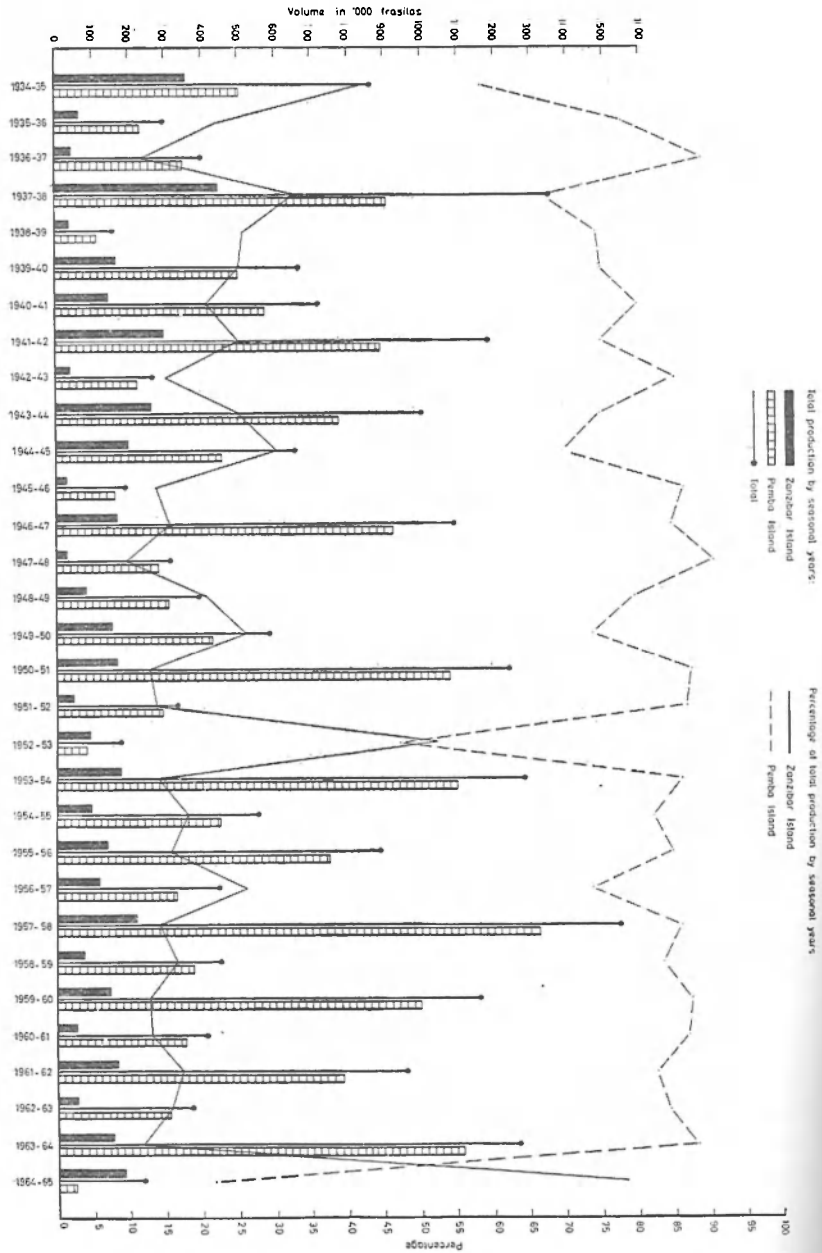


Figure 22. Production of cloves in Zanzibar and Pemba Islands, 1934/35 to 1964/65, by volume and percentage  
 Calculated from data obtained from the Zanzibar State Trading Corporation. *Note:* 1 frasila is equivalent to 34.9 lbs; one ton is equivalent to 64.2 frasilas; 1m. frasilas are equivalent to 15,580 tons.

Within the two islands specific areas within which clove production is concentrated may be distinguished. The 'clove belts' of both Zanzibar and Pemba Islands are well defined, and correspond to the core areas of export crop production discussed in Chapter VI in relation to the mainland ports. The clove belts are largely confined to the areas underlain by Lower Miocene sedimentary rocks, and avoid the areas of Pliocene and Pleistocene reefal limestone. The *Changa* soils, associated with the Lower Miocene Masingini beds in western Zanzibar, and the corresponding *Utasi* soils of north-central Pemba, are fertile sandy loams particularly suitable for clove-growing, whereas the coral areas of the eastern parts of both islands yield thin stony soils unsuitable for intensive cultivation of any kind. The predominance of Pemba in terms of clove production is directly related to the much greater extent of the Lower Miocene sedimentary rocks and associated soils in that island as compared to their much more restricted occurrence in Zanzibar. There is also a relationship with the pattern of communications; within both islands the zones of most intensive production tend to lie close to the main roads linking the rural areas to the ports, and the concentration of production in western Pemba may perhaps be related to the location on the western coast of the island of the three small ports of Wete, Chake Chake and Mkoani through which the clove production of Pemba is shipped in small coastal vessels to Zanzibar prior to its exportation overseas.

Although the coconut also grows best on sandy soils it is more tolerant of poorer soils than the clove tree and its distribution is thus much more widespread in both Zanzibar and Pemba Islands than that of cloves. The pattern of coconut distribution is in fact the converse of that of clove distribution: whereas Pemba is dominant in terms of clove production, Zanzibar leads in terms of coconut output. This reflects the general pattern of land utilization whereby the best, most suitable soils are devoted to the production of the most lucrative crop, whilst coconuts are widely grown on a variety of soils that are largely unsuitable for cloves. Outside the clove areas of the two islands coconuts are widely and fairly evenly distributed, and their cultivation is also important within the clove zones. A certain amount of local specialization was formerly important and may still occur in respect of the varied products of the coconut tree; the production of coir fibre, by the method of burying the coconut husks in the sands of the seashore for five months, was traditionally concentrated in the villages of the east coast of Zanzibar Island,

particularly Makunduchi, although most of the present-day output comes from small factories in the town.

In general terms, therefore, the pattern of clove and coconut production is the key to the pattern of the hinterland of the port of Zanzibar. This is true not only in the sense that these products provide over 95 per cent of the domestic exports, but also in the sense that the clove belts contain the main concentrations of rural population and therefore tend to be the chief source areas of minor exports (excluding marine produce) and the chief import-consuming areas. In this context the importance of Zanzibar town itself, as a major element within the hinterland, should not be overlooked; containing 19.4 per cent of the total population of Zanzibar and Pemba (1958 census), the town is the most important market in the islands both for imports and domestic produce, and also engages in the production of copra and coir fibre and in the distillation of clove oil for the export market.

#### **External trade**

The pattern of the external trade relations of Zanzibar is somewhat different from that which a superficial examination of the geography of the area might lead one to expect. Although trade with the East African mainland countries is important, especially as regards imports, it ranks lower than trade with several other overseas countries. In 1963 Indonesia and India together took 36.3 per cent of the total exports from Zanzibar (almost all cloves); these two countries constitute Zanzibar's traditionally most important clove markets, but both have declined in importance in this respect in recent years. In 1963 no other country purchased goods from Zanzibar worth more than £400,000 (i.e. approximately 7 per cent of the total exports), although eleven countries each purchased between 2 and 7 per cent of the total. Amongst the major export destinations Tanganyika and Kenya are the only African representatives. The emphasis on Asia is important, in that it represents a modern perpetuation of Zanzibar's historic trade relations; in 1963, 56.6 per cent of Zanzibar's exports went to Asian destinations (excluding U.S.S.R.). Within an East African context the comparative strength of trade links with Tanganyika is significant; this trade also has historic origins, and is important as one of the foundation stones of the United Republic of Tanzania.

Asian countries are not so predominant in terms of imports at Zanzibar, providing in 1963 34.9 per cent of the total import traffic. The United Kingdom, relatively unimportant as a market

for Zanzibar's exports, takes first place amongst sources of imports, providing in 1963 some 16.4 per cent of the total; essentially an indication of the United Kingdom's interest in Zanzibar as a protectorate, this trade may now decline as alternative sources of import commodities are built up in China and the U.S.S.R. In terms of total trade, Zanzibar's links with Indonesia, the United Kingdom and India are clearly the most outstanding; these countries accounted for 32.4 per cent of the total trade in 1963. Of the three, India ranks second in terms of both exports from and imports to Zanzibar, whereas Indonesia exports nothing to Zanzibar and the United Kingdom's share in Zanzibar's export trade amounted in 1963 to only 4.1 per cent. The trade balance with a number of other countries, notably Tanganyika and Pakistan, is rather more even.

The destination of clove exports from Zanzibar, the most important single item in the overseas trade of the islands, is naturally a subject of particular interest and is analysed in Table 24. This shows, for the five-year period 1959-63, the volume of cloves despatched to each country purchasing over 50 tons of cloves in one or more of the five years represented; the countries are listed in the order of importance in respect of their purchases in 1963. The main feature is the concentration of the market in a restricted area, re-emphasizing the vulnerability of Zanzibar's economic preoccupation with a very limited range of produce. Indonesia, where cloves are used in cigarette manufacture, is traditionally the main market, generally taking over half the total exports. Since 1960, however, sales of cloves to Indonesia have declined below 50 per cent of the total exports, and in 1962 the amount sold to Indonesia was extremely low — less than 10 per cent of the usual level. In that year, when the economic outlook for Zanzibar seemed particularly bleak, it proved possible to sell rather higher quantities than usual to Singapore, India, U.S.A. and a number of European countries. The total sold during 1962 was, however, considerably below the five-year average. The following year, 1963, showed a return to a more normal pattern, with Indonesia again taking a large percentage of clove exports from Zanzibar; Singapore, Pakistan and India constituting important secondary markets; and the remainder of the crop being widely spread in small consignments to many countries, mainly Asian and European.

The external trade relations of Zanzibar are summarized in Table 25 in which the foreland is divided into several zones of major significance. The East African mainland countries take

TABLE 24  
DESTINATION OF CLOVE EXPORTS FROM ZANZIBAR, 1959-63

Country	5 yr. Av.		1959		1960		1961		1962		1963	
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%
Indonesia ..	4,419	45.3	5,150	55.8	7,500	60.7	4,000	47.6	500	6.6	4,944	44.1
Singapore ..	961	9.8	230	2.5	194	1.6	955	11.4	2,133	28.0	1,293	11.5
Pakistan ..	744	7.6	456	4.9	610	4.9	803	9.6	661	8.7	1,190	10.6
India ..	761	7.8	979	10.6	881	7.1	470	5.6	1,025	13.4	452	4.0
U.S.S.R. ..	70	0.7	—	—	—	—	—	—	—	—	350	3.1
Japan ..	171	1.8	159	1.7	127	1.0	195	2.3	143	1.9	231	2.1
Sudan ..	112	1.1	3	0.03	39	0.3	163	1.9	139	1.8	216	1.9
U.K. ..	190	1.9	212	2.3	218	1.8	128	1.5	185	2.4	206	1.8
Arabia ..	118	1.2	125	1.4	48	0.4	128	1.5	92	1.2	199	1.8
Germany ..	195	2.0	131	1.4	224	1.8	21	0.3	308	5.4	192	1.7
U.S.A. ..	402	4.1	383	4.2	842	6.8	77	0.9	536	7.0	170	1.5
Nigeria ..	81	0.8	44	0.5	48	0.4	88	1.0	89	1.2	136	1.2
Netherlands ..	95	1.0	83	0.9	98	0.8	51	0.6	115	1.5	130	1.2
Ethiopia ..	104	1.1	100	1.1	80	0.6	133	1.6	88	1.2	121	1.1
China ..	93	1.0	120	1.3	130	1.1	—	—	100	1.3	116	1.0
Aden ..	80	0.8	94	1.0	64	0.5	69	0.8	78	1.0	97	0.9
Italy ..	64	0.7	49	0.5	58	0.5	39	0.5	82	1.1	91	0.8
S. Africa ..	67	0.7	68	0.7	59	0.5	56	0.7	69	0.9	85	0.8
Canada ..	66	0.7	59	0.6	68	0.6	68	0.8	66	0.9	69	0.6
France ..	31	0.3	—	—	9	0.07	2	0.02	80	1.0	62	0.6
Libya ..	57	0.6	31	0.3	56	0.5	55	0.7	85	1.1	60	0.5
Spain ..	47	0.5	37	0.4	53	0.4	29	0.3	58	0.8	58	0.5
Sweden ..	48	0.5	45	0.5	82	0.7	9	0.1	47	0.6	58	0.5
Iraq ..	29	0.3	9	0.1	45	0.4	10	0.1	28	0.4	51	0.5
Hong Kong ..	29	0.3	53	0.6	23	0.2	20	0.2	30	0.4	20	0.2
Egypt ..	49	0.5	207	2.2	1	0.0	8	0.1	13	0.2	15	0.1
Belgium ..	191	2.0	165	0.2	193	1.6	499	5.9	234	3.1	13	0.1
Goa ..	47	0.5	—	—	144	1.2	66	0.8	17	0.2	8	0.1
Malaya ..	31	0.3	24	0.3	75	0.6	28	0.3	26	0.3	—	—
Others ..	410	4.2	364	3.9	337	3.1	232	2.8	499	6.5	573	5.1
Total ..	9,762	100	9,231	100	12,346	100	8,402	100	7,626	100	11,206	100

Source: Calculated from Zanzibar Government, *Trade report for the year 1959* (Zanzibar, Govt. Printer, 1960), et. seq., pp. 5-6.

TABLE 25  
EXTERNAL TRADE OF ZANZIBAR, 1963

Forelands	Imports		Exports		Total	
	£	%	£	%	£	%
E. African Coast ..	1,021,210	16.62	611,514	10.37	1,632,724	13.56
Other Africa ..	601,385	9.79	360,682	6.12	962,067	7.99
United Kingdom ..	1,009,824	16.43	241,407	4.09	1,251,231	10.39
Other Europe ..	886,647	14.43	660,842	11.20	1,547,489	12.85
Indonesia ..	—	—	1,344,867	22.80	1,344,867	11.17
Other Asia ..	2,142,489	34.86	2,085,614	35.36	4,228,103	35.11
U.S.A. and Canada ..	155,835	2.54	181,165	3.07	337,000	2.80
Other ..	328,367	5.34	411,744	6.98	740,111	6.15
TOTAL ..	6,145,757	100.00	5,897,835	100.00	12,043,592	100.00

Source: Calculated from Zanzibar Government, *Trade report for the year 1963* (Zanzibar, Govt. Printer, 1964), pp. 2, 4.



only a 13.6 per cent share in the total trade of Zanzibar; and the dominant relationship is clearly with Asia (total: 46.3 per cent), particularly Indonesia (11.2 per cent). European countries have developed considerable trade links with Zanzibar (total: 23.2 per cent) in which trade with the U.K. figures prominently (10.4 per cent). Trade with African countries outside East Africa amounts only to 10.4 per cent of total trade, but trade with North America (2.8 per cent) and other areas is even less. The general pattern is therefore one of a restricted range of markets for exports and a restricted range of sources of imports, which reflects clearly enough the structure of Zanzibar's two-crop economy and the relatively low total purchasing power of her population.

#### *Notes and references*

1. Armed rebellion against the Sultan's Government took place on 11 January, 1964, one month after political independence had been achieved, and a Republic was declared three days later. Tanganyika and Zanzibar subsequently joined together to form a United Republic, renamed Tanzania. In Zanzibar there is considerable evidence of communist influence from Soviet, Chinese and East German sources.
2. The Zanzibar Wharfage Company Ltd., formerly known as the African Wharfage Company Ltd., is one of the four stevedoring companies which operated at the mainland ports prior to the introduction of the East African Cargo Handling Services system in 1964.
3. For further physical details see G. M. Stockley, *Report on the geology of the Zanzibar Protectorate* (Zanzibar Government, 1928).
4. Bishop of Zanzibar, 1874-82, and builder of the cathedral on the site of the slave market.
5. Zanzibar Protectorate, *Report on the Public Works Department for the year 1928*, p. 10.
6. The date of the completion of this structure is given in a letter from Sir Gerald Portal to Lord Salisbury, dated 22 July, 1892 (F.O. 84.2232, No. 167), cited in L. W. Hollingsworth, *Zanzibar under the Foreign Office, 1890-1913* (London: Macmillan, 1953), p. 67.
7. The authors of the original scheme were Mr. G. T. Nicholson, Harbour Advisory Engineer to the South African Government, and Captain Rainnie, Port Captain of Durban. The cost was originally estimated at £253,000, but eventually rose to over £400,000. See J. H. Sinclair, *Report on the Zanzibar Protectorate from 1911 to 1923*, (Zanzibar, Govt. Printer, 1923).
8. Zanzibar Protectorate, *Report on the Public Works Department for the year 1920*, p. 19.
9. *Ibid.*
10. The detailed history of the development of the present port area of Zanzibar is contained in the *Reports* of the Public Works Department of the Zanzibar Protectorate for the years 1920-29.

11. The dhow trade, to which reference was made in Chapter III, has clearly been of great importance in the past, although it has declined to almost negligible significance today. A useful geographical account of the dhow trade is provided by D. N. McMaster, 'The ocean-going dhow trade to East Africa', *E. Afr. geogr. rev.*, 4, 1966, 13-24.
12. The Clove Growers' Association is now known as the Zanzibar State Trading Corporation.
13. G. E. Tidbury, 'Agriculture in Zanzibar, (2) the clove industry', in *East African agriculture*, ed. J. K. Matheson and E. W. Bovill, (London: Oxford, 1950), p. 270.
14. Calculated from C. A. Bartlett, *Statistics of the Zanzibar Protectorate, 1895-1935* (Zanzibar, Govt. Printer, 1936), p. 17. Bullion and specie are not included in the calculation.

## CONCLUSION: THE SEAPORTS OF EAST AFRICA IN THEIR REGIONAL PERSPECTIVE

A multitude of factors enters into any consideration of a seaport, and the problem becomes increasingly complex when attention is focused upon a group of seaports in terms of their development in time as well as in space and in terms of hinterlands and forelands. To attempt a complete and thorough survey of all aspects of a port group in this wide sense would require several volumes each far longer than the present work, and would involve the discussion of much material of an essentially non-geographical nature. The geographical viewpoint of the present study permits the exclusion of any treatment of a wide range of technical and practical matters of prime concern to those whose responsibility it is to ensure the smooth working of the ports, but at the same time permits a broader appreciation of different aspects of seaports which those intimately involved in the minutiae of day-to-day port working may sometimes fail to grasp.

The seaports of East Africa are undoubtedly playing a fundamental and extensive role in the economic development of the area which they serve. This role is too often taken for granted, and its significance and implications insufficiently appreciated. The writers of the report of the East Africa Royal Commission, 1953-55, the most important general survey of East African conditions and problems to appear in recent years, paid no attention to port matters and discussed East African transport solely in terms of roads and railways. Ten years later it is not uncommon to hear repeated demands for new or extended railways, on the false assumption that railways inevitably promote economic development, but public attention seems to be devoted to seaports only at times when severe congestion causes widespread inconvenience. The development and maintenance of an adequate range of port facilities is, however, vital to any area engaging in external trade, and this is particularly the case in an area such as East Africa where the economic structure is based upon exports of primary produce and imports of manufactured goods. The seaports constitute a vital link in a chain of

transport elements by which this economic structure has been developed and is maintained. The high degree of dependence upon exports of primary produce directs attention to the fact that agricultural developments in East Africa are generally impeded by inadequate and unreliable rainfall, by soil deficiencies and by pests and diseases. Export crop production is concentrated in a number of limited core areas, which naturally also tend to become core areas of population concentration and import consumption. These are general considerations relating to East Africa as a whole, but they have a close bearing upon the seaports and upon the problems with which this study has been concerned. It is not enough to say that the seaports are vital to East Africa as a whole; it must also be appreciated that they are far more important in relation to certain parts of East Africa — to those favoured areas of population concentration and export production — than they are to those vast intervening spaces basically characterized by low population densities and subsistence economies. Undoubtedly there is scope for an expansion of economic activity in East Africa, and expansion is likely to be concentrated in existing core areas rather than to be more widely dispersed. The growth of the economies of the East African countries implies increasing external trade, and the question then arises as to whether the seaports serving the area, now and in the future, will be able to cope with traffic increases without suffering serious congestion.

Conditions of situation for the East African port group as a whole are generally advantageous, and site conditions at individual terminals do not present any insuperable obstacles to physical expansion, in the context of the functional framework within which each port now operates and is likely to continue to operate in the foreseeable future. The conditions of land and water situation which now favour the growth of the seaports have largely arisen during the last hundred years; previously East African seaports lay between an undeveloped potential hinterland and a maritime trade system largely controlled by the wind regime of the Indian Ocean and with few direct links outside that ocean. Developments on both the landward and seaward sides have now intensified and enormously widened the significance and relationships of the seaports, so that they no longer lie in a backwater but maintain links with major seaports in all the inhabited continents. The East African coast is particularly fortunate in being equipped with several good natural harbours, where adequate shelter and deep water close inshore

remove that dependence upon tidal fluctuations which so rigidly restricts shipping manoeuvres in many other countries. Mombasa, particularly, has been fortunate in its possession of two harbours, one suited to medieval conditions and one to modern circumstances. The potentialities of the harbour at Dar es Salaam were not appreciated until the era of steam navigation was well established, illustrating how harbour utilization is partly a function of navigational conditions and techniques as well as a reflection of the conditions of land and water situation. Although the shallowness of the harbour at Tanga has prevented the development of deep-water facilities there, it is at Dar es Salaam that site conditions are proving most restrictive in relation to present and future developments. The port of Mtwara, in spite of its possession of what is perhaps the best natural harbour on the East African coast, has seen comparatively little development as a result of adverse circumstances in terms of the land situation. At Zanzibar, circumstances of situation and site are the least encouraging amongst East African seaports; an offshore island, an indifferent site and a minute hinterland do not stimulate increased traffic flow in modern conditions.

There is a fundamental similarity in the pattern of development that each East African seaport has followed in modern times. According to Dr. J. H. Bird, author of the *Anyport* concept applied to the seaports of East Africa in Chapter III, "there is one main reason why major ports should show similar features of layout, arranged in many different ways, even if they grew up independently on widely differing sites. All major ports serve the same world fleet of shipping, or similar cross-sections of it, with the result that they have the same incentives to provide terminals of similar dimensions and capacities".<sup>1</sup> An outstanding feature of the seaports of East Africa is, however, that their development within the *Anyport* framework has reached widely varying levels. Only two of the five members of the port group represent in their modern layout all eras of growth from that of *dhow traffic* to that of *specialized quayage*; two others have not progressed beyond the era of lighterage quays, described as *marginal quay extensions*; and one terminal, although equipped with deep-water facilities belonging to the era of *simple lineal quayage*, shows only negligible vestiges of any earlier eras. The explanation for this extremely uneven pattern is that, whilst all five of the ports discussed are of major significance in a local East African context, only the two larger terminals could claim to be major seaports in an international sense. It is at these

larger terminals that the fullest extent of development has been experienced, and towards them that an increasing proportion of the total traffic handled by the group is likely to turn in the future.

The level and range of facilities provided at the seaports of East Africa cannot be regarded, in most cases, as more than barely adequate in terms of present needs, and, in the context of likely traffic increases in the future, close attention should now be given to the form which the expansion or rehabilitation of equipment should take. There is a natural but unfortunate tendency to take port facilities for granted, to assume that they are adequate until increasingly frequent congestion and public outcry prove otherwise. Too often port expansion tends to be a move made in desperation in the face of intolerable pressure upon existing facilities; it should be, instead, undertaken as part of a broad, flexible plan designed not only as a present expediency but also as an investment for the future. Wherever possible port facilities should always be well ahead of present traffic needs, so that as the volume of traffic increases it can be absorbed without congestion. Whilst the dangers of over-capitalization and resultant heavy interest charges must be avoided wherever possible, the cost of making available at all times an adequate margin of spare capacity needs to be compared with the cost of the delays, frustrations and traffic losses which inevitably result if serious congestion is allowed to occur. Naturally such an ideal pattern of development is rarely carried out, chiefly because financial provision for port expansion is not often made available until the need for it is extremely pressing. Most ports manage to keep their facilities slightly ahead of traffic requirements at most times, but since traffic growth occurs at an uneven rate periods of congestion are an almost inevitable feature of port growth. At the seaports of East Africa there is fortunately a general awareness of the importance of these considerations. Regrettably, however, these views are not always shared by those organizations through which provision for expansion might be made. Commenting on the E.A.R. & H. forecast of capital expenditure on harbours for the period 1963-67, which amounted to £5.56 million, the World Bank economic survey mission to Kenya commented in 1962: "We think that a critical review looking to a downward revision of the programme should be undertaken. Capital expenditure on East African harbours should be limited for the next few years to that required for safe operation, to complete projects already carried to a point where

failure to complete would cause serious loss of funds already spent, or to prevent excessive delays in traffic under normal conditions".<sup>2</sup> This standstill policy may have certain immediate advantages based on financial expediency. It assumes, however, that a degree of congestion is to be expected at all times and that severe congestion is to be tolerated when conditions vary from 'normal'. In the long run such a policy might well prove disastrous; since it must be assumed that traffic flow will continue to rise in volume, at least at the larger terminals, and that this increase will probably be gradual but may involve sharp rises, provision must also be made for a gradual expansion of facilities to keep ahead of traffic requirements. Otherwise, if facilities are allowed to fall seriously behind traffic levels, an extremely difficult situation might build up which would have far-reaching implications for the East African economy and from which the ports would find it very difficult to recover.

Complaints of congestion at East African seaports have mainly referred to delays in the handling of import cargo. Congestion, in terms of a queue of ships waiting to be worked rather than of inadequate space in the transit sheds and stacking grounds, has occurred at intervals during the development of the seaports and has been particularly serious at Mombasa, although the problem of peak traffic periods arises to some extent at all the major East African terminals. Rarely, however, has congestion reached such a critical state as occurred during the early months of 1965. Calculations have shown that the monthly practical capacity of the port of Mombasa is in the region of 142,000 deadweight tons of cargo; this estimate pre-supposes a reasonable balance of import and export cargo. During much of 1965 tonnages in excess of 142,000 were handled almost every month, and the port was working under serious and severe pressure during the first half of the year, with delays of up to ten days in berthing ships. Imports present a greater problem than exports because of the nature of the goods handled; problems attached to working export cargo are relatively simple because relatively few commodities are involved, quantities are relatively large, and mechanization can therefore be employed to the full. Imports, in contrast, consist of a much wider range of goods in smaller consignments of very varied shape and size. The administrative problem involved in handling import cargo is also greater, and mechanization cannot be employed to the same extent. Partly in an attempt to overcome problems of congestion, the General Manager of E.A.R. & H. constituted in 1965 a Port

Advisory Council at each of the three larger mainland terminals of Mombasa, Dar es Salaam and Tanga. The function of the Councils is to increase co-operation between the E.A.R. & H. port department, shipping interests, cargo handling agents, chambers of commerce and all others involved as a means of working towards more efficient handling of cargo. An immediate but only partial answer to the problem of congestion lies in increases in the port labour force; this was effected at Mombasa early in 1965. A long-term answer lies, however, fundamentally in the expansion of facilities, a measure which is becoming increasingly urgent at Mombasa and Dar es Salaam.

The question of expanding port facilities at the seaports of East Africa does not raise critical difficulties in terms of available land and water space. At Mombasa a major phase in the expansion of port facilities was achieved in 1961 when berths 11 and 12 were brought into service on the mainland at Kipevu (Fig. 7). Considerable delay has unfortunately occurred in the completion of berths 13 and 14; these formed part of the original Kipevu Project on which work began in 1957, and the basic construction of berths 11-14 was undertaken at the same time as a matter of economic convenience, but the second pair of berths were not brought into service until 1967. Although it was never intended that berths 13 and 14 should be brought into service at the same time as berths 11 and 12, slow progress on the full completion of the Kipevu Project, resulting from financial difficulties, has undoubtedly been an important factor in the recent history of congestion at Mombasa. Delays would however have been more severe, and the work much more costly, had berths 13 and 14 not been constructed up to water level in the earlier phases of the Project. The fundamental cause of congestion is that port authorities are unable to secure funds for port expansion sufficiently far in advance; although port authorities are well aware of the need for the expansion of facilities to keep pace with that of traffic, those who control sources of funds are unwilling to make finance available until procrastination is no longer possible. In such circumstances congestion is inevitable and is likely to recur with increasing severity. Already the port authorities at Mombasa have prepared plans for four additional deep-water berths at Kipevu, to be numbered 16-19 and sited between berth 14 and the oil terminal; preliminary work on these extensions is now in hand. Beyond this stage, which is hardly likely to see complete fulfilment before the early 1970's if the present rate of progress is maintained, the port authorities have



not yet decided upon the subsequent pattern of development at Mombasa. The siting of the Kipevu oil terminal would hinder further westward expansion of deep-water facilities along the northern shore of Port Reitz, and there is a lack of deep water close inshore west of the oil jetty. The implications of the siting of the jetty in terms of the likely direction of future port expansion at Mombasa may not have been fully investigated at the time when the site was chosen. There are, however, two other possible sites for future deep-water berths at Mombasa. The south-western shore of Mombasa Island, now occupied by lighterage quays and miscellaneous facilities, could be rehabilitated as a new zone for deep-water berths; this would, however, present difficulties as the land site is not particularly stable and some interference in the movement of vessels entering and leaving Kilindini might be caused as a result of the narrowness of the channel at this point. More likely as an eventual site for deep-water facilities is the western shore of Kilindini Harbour between Ras Kigangone and Mueza Creek; here there is plenty of space and deep water close inshore, but communications with Mombasa Island and with the hinterland would present problems costly to resolve. Probably extensive dredging along the northern shore of Port Reitz, west of the oil terminal, would be less expensive than the development of bridges or tunnels carrying rail links between the western side of Kilindini and the rest of the port, and, in spite of a reduction in security at the oil terminal, would produce a more logical pattern of development.

Active consideration is also being given to the form which port expansion should take at Dar es Salaam. When the present Main Quay was completed in 1956 it was felt that no further thought need be given to the expansion of facilities at that port for some time to come. This view is now outmoded, and although serious congestion has not yet become a frequent occurrence it may well do so before the next stage in the expansion of facilities is completed. Plans are now well-advanced for the construction of additional deep-water berths to the south of the present Main Quay on the western shore of Southern Creek (Fig. 8), and there are no serious physical problems involved in continuing the line of deep-water berths southwards as the need arises. As a result of political circumstances in Eastern Africa this need may arise rather sooner than was anticipated. For some years, and particularly since the disintegration of the Central African Federation in 1963, the economic and political orientation of Zambia towards East Africa rather than towards Rhodesia has become increas-

ingly clear. Plans were already well advanced for an international rail link between the Zambian copperbelt and Dar es Salaam (Fig. 2) before Rhodesia's illegal seizure of independence in 1965, and the possibility of a major new road link between Zambia and Tanzania is also being considered, perhaps using Mtwara as the ocean terminal. These developments would have important implications for the port of Dar es Salaam, since considerable pressure would build up on existing facilities there if a significant part of Zambia's copper exports were to be channelled through the Tanzanian terminal. In 1963 copper production in Zambia reached 645,000 tons, valued at £118m. If this commodity were to be moved entirely through Dar es Salaam the export traffic of the port would increase by over 200 per cent and the total traffic handled by at least 75 per cent. Clearly, such increases would have far-reaching implications in terms of cargo handling facilities, although the handling of a single commodity in bulk would not present as many difficulties as would the shipping of an equivalent quantity of miscellaneous cargo.

Problems relating to the inadequacy of port facilities at the three smaller ocean terminals of East Africa are less severe than at Mombasa and Dar es Salaam; but whereas the problems of the two larger terminals focus essentially upon the need for additional deep-water quayage, the difficulties of the three smaller ports are of a different kind. Tanga is still a lighterage port, and is likely to remain so. As a result of its situation between two larger seaports, its inferior harbour and its restricted hinterland, Tanga has never attained a sufficiently high level of traffic flow to justify expenditure on deep-water berths. Moreover, 72 per cent of the total volume of cargo handled at Tanga (1963) consists of sisal exports, which are less likely than many other commodities to suffer from the double transshipment that is involved in lighterage. Although a deep-water quay would no doubt be very useful at Tanga, the case for building one is very slight, especially in view of the far more pressing needs elsewhere. The deep-water facilities that exist at the port of Mtwara are grossly under-employed for the greater part of the year, but during the short season around the turn of the year when the bulk of the cashew nut and cassava crops are exported there is temporary but severe pressure on facilities. This applies, however, to quayside storage space rather than to berthing accommodation, and has recently been alleviated by the completion of new sheds. A possible means of utilizing the spare capacity that is available at Mtwara during the greater part of the year would be to con-

nect Mtwara by a major road route to the Zambian copperbelt. This would involve either a ferry across Lake Malawi or a devious route around the head of the lake, but in the long term it might prove less expensive than the large-scale expansion of facilities at Dar es Salaam. At the port of Zanzibar there is also a certain amount of spare capacity, since the level of traffic handled has never caught up with the facilities provided in 1929. There is therefore little need for the expansion of facilities at Zanzibar in terms of level, although in terms of the range of equipment some improvements might profitably be effected; what is needed more urgently is the replacement of out-of-date equipment which is unlikely to give efficient service for many more years.

The problem of the expansion of port facilities also needs to be seen in the context of a new factor, that of changes in the method of cargo handling. Within the next decade it is likely that a fairly high proportion of general sea cargo will be unitized and transported on land and sea in containers of up to 25 tons capacity. Port handling will be highly automated as a result, and the turnaround of shipping speeded up. Existing deep-water berths in East Africa are suitable for this purpose, although problems may arise from the restriction of storage space near the quays. Furthermore, many of the frustrations of dealing with lighterage cargo at Tanga would be removed if ships using containers and carrying unitized loads were introduced, equipped with their own handling gear. Although it may seem that it will be some time before East African seaports, and other similar seaports in developing countries, can take advantage of what has been described as "the container revolution", the pace is likely to be forced by the developed countries where the automation of cargo-handling processes will go forward rapidly. Shipowners and others involved in sea transport to and from developing countries will require that port facilities in those countries match up to facilities in industrialized lands, or at least to a rising world minimum level. The implications of these developments have yet to be fully worked out, but for East Africa they would seem to indicate that long-term plans for the further development of facilities at the seaports must take careful account of the unitization factor, which will increase ship and cargo-handling capacity without necessarily involving parallel increases in berthing facilities.

The organization of port working at the seaports of East Africa has attained a reasonably high level of efficiency. At the mainland ports, this is especially associated with a major re-

organization of cargo-handling methods achieved in 1964, whereby four stevedoring companies and one shore-handling company were replaced by a single co-ordinated organization wholly owned by the E.A.R. & H. This reform has effected an improvement in the efficiency of port working. At the port of Zanzibar cargo-handling services are performed by a single company and, given the limitations imposed by the level and range of facilities available at that port, efficiency of working reaches an adequate standard. The East African port industry is not particularly strike-prone, but labour productivity does not reach as high a level as might be attained and, as in other parts of the world, this is a major reason why maximum efficiency can never be achieved.

The traffic of the port group as a whole has recently shown a marked upward trend. In 1964 the total tonnage of cargo handled at the four mainland terminals exceeded 5 million dead-weight tons for the first time and represented an increase of almost 20 per cent over the previous year. Such a large increase is unprecedented in recent years, but since it arose largely from increased oil imports at Mombasa after the opening of a refinery there its implications in terms of general cargo movements and facilities are not as important as might at first appear. There has been a steady but small overall rise in the traffic handled at the mainland terminals in the past decade; the total volume dealt with in 1963 was 38 per cent above that handled in 1953. This increase is not spectacular, but the rate of growth may be steeper in the future as the economies of the East African countries attain a more mature level. Many of the main export commodities have shown a tendency to increase quite sharply in volume in recent years: amongst these are coffee, cement and tea passing through Mombasa; cotton, cashew nuts and tea through Dar es Salaam; sisal through Tanga and cashew nuts through Mtwara. Some other export commodities are, however, declining in significance; these include all the more important products passing through the port of Zanzibar, except copra. Dry cargo imports have not risen to the same extent; the totals handled at the four mainland ports in 1953 and 1963 are very similar, and in 1963 and 1964 dry cargo imports at the two larger seaports showed a slight decline. Bulk oil imports, however, continued to rise; the 1963 figure represents an increase of 80 per cent on the 1953 total, and this trend is the chief single factor accounting for the overall traffic increases that have occurred. These increases have also affected the relative importance of the

four mainland terminals (Table 26). From 1949 to 1962 Mombasa handled between 68 and 73 per cent of the total cargo traffic of the mainland ocean ports, and Dar es Salaam dealt with between 16 and 22 per cent. In 1964 Mombasa's share of the total rose to a record level of 77.3 per cent, and the proportion handled at Dar es Salaam fell to 16.0 per cent. This widening gap between

TABLE 26  
PERCENTAGE OF TOTAL CARGO TRAFFIC OF EAST AFRICAN MAINLAND SEAPORTS  
HANDLED AT INDIVIDUAL TERMINALS 1949-64

Year	Mombasa	Dar es Salaam	Tanga	Mtwara <sup>1</sup>
1949 ..	72.2	16.8	6.4	4.5
1950 ..	73.3	16.3	6.8	3.5
1951 ..	73.4	17.2	6.4	3.0
1952 ..	71.5	18.8	6.6	3.1
1953 ..	70.6	19.7	7.0	2.7
1954 ..	70.6	20.4	6.6	2.5
1955 ..	68.2	21.5	7.6	2.8
1956 ..	68.3	21.4	7.1	3.2
1957 ..	70.4	20.1	6.1	3.4
1958 ..	71.6	20.1	5.2	3.1
1959 ..	70.9	20.4	5.5	3.1
1960 ..	69.8	21.9	5.2	3.1
1961 ..	71.8	19.3	5.9	3.0
1962 ..	71.6	20.0	5.4	3.0
1963 ..	73.9	18.6	4.8	2.7
1964 ..	77.3	16.0	4.2	2.5

Source: Calculated from E.A.R. & H., *Annual report for the year ending 31 December 1949, et. seq.*, Statement no. 30.

1. Includes Lindi except in 1963 and 1964.

the two major ocean terminals is almost entirely due to oil imports, and may prove to be a temporary feature since an oil refinery was opened at Dar es Salaam in 1966 and crude oil imports there have increased the total port traffic. An increasing concentration of general traffic at Mombasa would, however, only aggravate the present situation in which congestion may very easily arise.

Although many parts of East Africa may be said to lie entirely within the hinterland of a particular seaport, there is no simple pattern of mutually exclusive hinterlands. In parts of the world where economic development is based on the export of a small range of primary commodities, and where a small number of ports serve a relatively large area, a fairly simple hinterland structure may be expected. Nevertheless, any port has many individual commodity hinterlands, the correlation of which may

be used to develop a reasonably accurate picture of the composite hinterland of the port. In East Africa, each composite hinterland consists of a series of fairly well-defined core areas of production for export, and the pattern of these core areas is far more dense within the hinterland of Mombasa than within the tributary area of any other East African seaport. In all parts of East Africa, however, core areas are separated by wide zones of little significance in the cash economy. No definitive boundary delimits the hinterlands of the East African seaport group as a whole, although very little traffic passes coastwards across the political boundaries to the north, west and south. A considerable area of the eastern Congo, as well as Rwanda and Burundi, lie within the potential extra-national hinterlands of the East African ocean terminals. The hinterlands of Dar es Salaam, Tanga and Mtwara are in large measure mutually exclusive, but that of Mombasa extends into northern Tanzania in three distinct areas, impinging upon the hinterlands of Tanga and Dar es Salaam. This feature results from the superior facilities available at Mombasa, from the concentration at that port of the control of the coffee trade, and from the relative proximity of the three most northerly mainland terminals in relation to the East African mainland as a whole. It is possible that attempts will be made, for political reasons, to direct traffic originating in these overlap areas to Tanzanian seaports rather than to Mombasa; this would probably be of little consequence as far as coffee from Bukoba and cotton from the Musoma area are concerned; any attempt to divert the coffee and other traffic of the Moshi-Arusha area through Tanga should, however, be strongly discouraged, since Tanga is not equipped to handle significant traffic increases and since there are administrative and financial advantages in concentrating the flow of coffee through the major Kenyan terminal. The only logical basis on which such a diversion could take place would be if congestion at Mombasa became so serious that overflow traffic could be diverted to Tanga as an emergency measure. Some implications of the possible extension of the hinterland of Dar es Salaam to include the Zambian copperbelt have already been discussed.

The external trade relations of the seaports of East Africa are principally conducted with those countries which were formerly colonial powers in the area — the United Kingdom and West Germany — with the United States and with India. There is a present trend for the relative significance of trade with European countries to decline in favour of trade with Asian

states; this is perhaps a natural tendency at the conclusion of the colonial period in East Africa, and marks a partial return to a much older pattern of trade, orientated towards India and countries beyond, which persisted for more than a thousand years before the coming of the Europeans.

The ports of Mombasa and Dar es Salaam have developed, during the twentieth century, as the twin master gateways to and from East Africa, thus replacing the port of Zanzibar which fulfilled that role a hundred years ago. Their position has been stabilized by the provision of railway communications inland, and they are therefore likely not only to retain their predominant position but to consolidate it. The division of the greater part of East Africa between the hinterlands of these two ports stems from the partition of the area between 1886 and 1919 into two colonial dependencies administered respectively by Great Britain and Germany. These very temporary political circumstances, coinciding with the building of the initial arteries of rail communication, effectively ensured the continuing division of East Africa into two economic compartments, each with its own principal railway and port.

Whilst the smaller mainland terminals of Tanga and Mtwara are integrated within the general pattern of transportation on the mainland and individually present few problems, the position of the port of Zanzibar is at present both anomalous and unfortunate. Initially developed to fulfil a role now performed by other seaports, Zanzibar has inevitably declined into relative insignificance as its hinterland has been progressively reduced by increasingly adverse economic and political circumstances. Theoretically Zanzibar and Tanganyika now form a united republic, but in practical terms there is little sign of any marked degree of unity. No attempt has yet been made to bring Zanzibar within the jurisdiction of the port and customs authorities of the mainland, through the East African Common Services Organization; such a measure would be difficult and complex in practical terms, and perhaps would hardly be worthwhile since the tide of history now implies that Zanzibar will never again be a great port, but locally it would produce a more rational and efficient system of operation than exists at present.

The major role which the seaports of East Africa are fulfilling affects in some degree the lives of all the people of the area. In view of the problems inherent in the East African environment, the seaports are playing their part with a high degree

of efficiency. The first concern of all who are involved in any aspect of port working should be to maintain and improve efficiency, for the cost of any inefficiencies can be widespread, long-lasting and serious.

*Notes and references*

1. J. H. Bird, *The major seaports of the United Kingdom* (London, 1963), p. 417.
2. The International Bank for Reconstruction and Development, *The economic development of Kenya*, Report of an economic survey mission (Nairobi, 1962), p. 138.



## APPENDICES

### A. Statistical Note

The reliability of statistical information available in East Africa varies considerably. The East African Railways and Harbours Administration maintains very detailed and valuable records, in the form of a Hollerith code, of all freight movements on the railways, and detailed records of commodity movements through the ports are also kept. Considerable reliance has been placed upon these records, and no reason has been found to doubt their general reliability. Some difficulty has arisen, however, in analysing the volume of commodity flow through the ports as a result of the fact that many records have been, and still are, kept in harbour tons, whereas others are more readily available in deadweight tons. Conversion from one form of measurement to the other is not an easy or accurate process. Material based upon both forms has been used, the unit of weight being always clearly indicated. A few of the more recently constructed maps, diagrams and tables include data relating to the year 1964, but in most cases material presented graphically does not continue beyond 1962 or 1963 although later figures are sometimes quoted in the text. In some ways 1963 may be taken as a reasonably representative year when traffic flow in East Africa had returned to normal after the severe disruption caused by flooding in 1961-62, and when various extensions to the pattern of East African railways had been completed. In Zanzibar, 1963 was the last 'normal' year before the 1964 revolution which seriously disrupted traffic movements and had serious effects upon the economy of the islands.

### B. Select Bibliography

The literature of port geography has received some notable additions in recent years. The publication of Alexandersson and Norstrom's *World shipping: an economic geography of ports and seaborne trade* provides a very useful world survey of the subject of a type that did not previously exist in English. An analysis in depth on a more restricted canvas is contained in J. H. Bird's *The major seaports of the United Kingdom*; Bird introduces the concept of *Anyport* as an aid to port study, a method which is applied to the seaports of East Africa in the present work. In

an East African context the volume of available literature on the geographical aspects of transportation is increasing rapidly. Studies that have been made within recent years, and have some relevance to the present work, include I. S. van Dongen, *The British East African transport complex*, a study concerned largely with the effects of economic activities on the transport pattern, and A. M. O'Connor, *Railways and development in Uganda*, which analyses the effects of transport facilities on economic activities and which is based on sources of primary material similar to those used in part of the present work. In the precise field of the geography of East African seaports Mrs. I. S. van Dongen has published a paper on Mombasa and, in collaboration with Professor W. A. Hance, a study of Dar es Salaam; these are broadly based and serve as useful summaries. Most other accounts of East African seaports contained in general works of reference appear to be based chiefly upon the publicity material issued by the E.A.R. & H. There is no lack, however, of primary source material within the field, and it is upon this material that much of this book is based. Primary sources tapped most extensively include the records and files of the E.A.R. & H., of public organizations such as the coffee, cotton and sisal marketing associations, the oil companies, government departments and private firms.

Most of the works consulted during the preparation of the work have already been cited in the notes and references appended to individual chapters. The select bibliography includes a few additional items, but its purpose is to list the main general sources of information that are readily available within the field of study of the present work. References are given under headings which correspond broadly with the main sections of the book.

**Port geography: general works**

F. W. Morgan, *Ports and harbours* (London: Hutchinson), 1952.

G. G. Weigend, 'Some elements in the study of port geography', *Geogr. rev.*, 48, 1958, 185-200.

G. Alexandersson and G. Norstrom, *World shipping: an economic geography of ports and seaborne trade* (New York, London: Wiley), 1963.

**African seaports: general works**

G. H. T. Kimble, *Tropical Africa*, Vol. I, *Land and livelihood* (New York: 20th Century Fund, 1960, pp. 447-62.

W. A. Hance, *The geography of modern Africa* (New York: Columbia), 1964, pp. 32-34.

**The growth of East African seaports**

M. F. Hill, *Permanent Way*, Vol. I, *The story of the Kenya and Uganda railway* (Nairobi: E.A.R. & H.), 1949; Vol. II, *The story of the Tanganyika railways* (Nairobi: E.A.R. & H.), 1957.

**The modern seaports of East Africa and their traffic**

East African Common Services Organization: *Annual Report*, East African Railways and Harbours Administration. (Nairobi, annually).

I. S. van Dongen, *The British East African transport complex* (Dept. of Geography, Univ. of Chicago, Research Paper No. 38, 1954).

W. A. Hance & I. S. van Dongen, 'Dar es Salaam: the port and its tributary area', *Ann. assoc. Amer. geogr.*, 48, 1958, 419-35.

I. S. van Dongen, 'Mombasa in the land and sea exchanges of East Africa'. *Erdkunde*, 17, 1963, 16-38.

D. N. McMaster, 'The ocean-going dhow trade to East Africa', *E. Afr. geogr. rev.*, 4, 1966, 13-14.

**The hinterlands of the seaports of East Africa: general works**

East Africa Royal Commission, 1953-55: *Report* (London: H.M.S.O., Cmd. 9475), 1955 (reprinted 1961).

International Bank for Reconstruction and Development, *The economic development of Tanganyika* (Dar es Salaam, Govt. Printer), 1960; *The economic development of Uganda* (Entebbe: Govt. Printer), 1961; *The economic development of Kenya* (Nairobi: Govt. Printer), 1962.

E. W. Russell (ed.), *The natural resources of East Africa* (Nairobi: East African Literature Bureau), 1962.

V. C. R. Ford, *The trade of Lake Victoria* (Nairobi: Oxford University Press, for the East African Institute of Social Research), 1955.

A. M. O'Connor, *An economic geography of East Africa* (London, Bell & Sons), 1966.

### C. Map References

1. **Admiralty Charts: Africa, East Coast** (London, Hydrographic Department, Admiralty)

- |     |   |
|-----|---|
| No. | 616 Approaches to Mombasa (1:75,000, 1948).         |
|     | 661 Kilwa Kisiwani (1:78,900, 1903).                |
|     | 663 Manza and Tanga Bays (1:37,900, 1951).          |
|     | 665 Approaches to Zanzibar (1:75,000, 1956).        |
|     | 666 Port of Mombasa (1:12,500, 1956).               |
|     | 674 Approaches to Dar es Salaam (1:50,000, 1954).   |
|     | 681 Lindi Bay (1:24,000, 1961).                     |
|     | 684 Mtwara and Mikindani Harbours (1:36,300, 1950). |
|     | 691 Mtwara Harbour (1:36,300, 1950).                |
|     | 693 Dar es Salaam (1:7,500, 1956).                  |
|     | 866 Plans in Tanganyika and Kenya (1:75,000, 1948). |
|     | 3211 Zanzibar Harbour (1:12,500, 1955).             |

2. **East Africa: general**

Seven maps, at a scale of 1:4,000,000, accompanying the handbook *The natural resources of East Africa*, ed. E. W. Russell, (Nairobi: E. Afr. Literature Bureau, 1962):

- (i) General.
- (ii) Physical features.
- (iii) Mineral resources, forests and game reserves.
- (iv) Rainfall probability, population and drainage basins.
- (v) Vegetation
- (vi) Geology.
- (vii) Soils.

3. **East African coast: general**
  - (a) *International Map of the World*, 1:1,000,000.
    - (i) Series 1301, sheet SB-37, *Dar es Salaam* (ed. 3-DOS, 1964).
    - (ii) Series 1301, sheet SC-37, *Lindi* (ed. 4-DOS, 1964).
  - (b) East Africa, 1:250,000, series Y503.
    - (i) Sheet SA-37, pts. 11 & 12, *Lamu* (ed. 1-GSGS, 1963).
    - (ii) Sheet SB-37-3, *Mombasa* (ed. 1-GSGS, 1963).
4. **Kenya, 1:50,000, series Y731 or SK11**
  - (i) Sheet 180/IV, *Lamu* (ed. 3-SK, 1964).
  - (ii) Sheet 193/I, *Malindi* (ed. 2-SK, 1960).
  - (iii) Sheet 198/II, *Kilifi* (ed. 2-SK, 1959).
  - (iv) Sheet 198/III, *Mazeras* (ed. 2-SK, 1960).
  - (v) Sheet 201/I, *Mombasa* (ed. 3-SK, 1964).
5. **Tanzania, 1:50,000, series Y742 (DOS 422)**
  - (i) Sheet 130/EI, *Tanga* (ed. 3-DOS, 1963).
  - (ii) Sheet 186/IV, *Dar es Salaam* (ed. 4-TSD, 1964).
6. **Zanzibar, 1:63,360**
  - (i) *Zanzibar Island*, 2 sheets, series Y744 (ed. 2-GSGS, 1959).
  - (ii) *Pemba Island*, 2 sheets, (ed. 2-GSGS, 1942).
7. **Mombasa Island: special sheet**

*Mombasa Island and environs*, 1:14,000, series SK54 (ed. 1-SK, 1963).

---

● **THE SEAPORTS OF EAST AFRICA** ●

East African Studies No. 26

B. S. HOYLE

This is the first full-length geographical study of the growth of the major seaports of East Africa. Dr. Hoyle has brilliantly analysed the complex economic and environmental factors involved in the development of the seaports and has included detailed studies of Mombasa, Tanga, Dar es Salaam, Zanzibar and Mtwara.

SHS. 17/- IN EAST AFRICA

**an eaph publication for the**

**MAKERERE INSTITUTE OF SOCIAL RESEARCH**

**OTHER MISR PUBLICATIONS AVAILABLE**

**DEVELOPMENT PLANNING IN EAST AFRICA**

**PAUL CLARK** 16/-

**THE COMMON MARKET AND DEVELOPMENT**

**IN EAST AFRICA PHILIP NDEGWA** 15/-

**THE SUGAR INDUSTRY IN EAST AFRICA**

**CHARLES FRANK** 15/-

**TAXATION FOR DEVELOPMENT**

**DHARAM GHAI** 20/-

**THE DEVELOPMENT OF TRADE UNIONS**

**IN UGANDA ROGER SCOTT** 27/50



**write for our list:**

---

● **EAST AFRICAN PUBLISHING HOUSE** ●

**KOINANGE STREET, P.O. BOX 30571, NAIROBI**

---

This work is licensed under a  
Creative Commons  
Attribution – NonCommercial - NoDerivs 3.0 Licence.

To view a copy of the licence please see:  
<http://creativecommons.org/licenses/by-nc-nd/3.0/>