PLANNING FOR WATER TRANSPORT ON LAKE VICTORIA

BY

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N A I R O B I

D E C L A R A T I O N

This Thesis is my Original work
and has not been presented for a degree
in any other University.

Signed .....

(Candidate)

This Thesis has been submitted for
examination with my approval as University
Supervisor

Signed .....

(Supervisor)

THIS WORK IS DEDICATED
TO MY LOVING FATHER
MR. CHRISTOPHER OGARE
OBILA

A C K N O W L E D G E M E N T S:

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A B S T R A C T

In an effort to exploit extensively the available resources and in order to provide access and consequently enhance the economic development of rural areas, the Kenyan Government has put as a priority, among others, the development and improvement of transportation facilities throughout the nation, since this in some parts has thwarted the development of certain regions.

The theme of this particular study is on the improvement of a transport system. The study has examined extensively the Water Transport on Lake Victoria within the Kenyan territory. This lake transport has alot of potential that if effectively exploited can help solve some of the transport problems experienced along the lake region, but unfortunately, it has been underutilized as a potential resource in terms of transportation.

In this study an attempt has been made to examine the various forms of Waterborne transport on the lake and identify the problems effecting its development and the areas that have potential but have been underutilized giving causes as to the under utilization. Above all it is the objective of this study upon the identification

of areas of weakness to plan for the development of this system of transport in integration with the other modes of transport within the study area. In considering the water transport, the effective hinterland of this Lake Transport has been specifically defined and considered as equally important in the development of the Lake transport

A detailed analysis of the study area has been done so as to identify the resource areas that make use of the lake transport and how these resources can be harnessed and chanelled for transportation through the lake with the ultimate aim of improving the economic growth of the area around the lake. In this connection the existing Government policies regarding all the various transport modes in the country has been examined together with the other existing modes of transport within the study area.

Important findings emerging from the study in general are that the lake has alot of potential for the development of an efficient water transport system, however, among the problems identified to be affecting it are the lack of specific Government policies and attension for this particular mode of transport. Also detrimental to the transport system in general is the disorganisation of the various modes of lake

transport. The study has therefore recommended for a more Specific Government Policy formulation regarding this transport mode and advocates for the organization of all the major modes of transport on the lake.

The policy proposals or plans at the end of this study aims at solving these problems with as minimal financial expenditures as possible. More stress has consequently been placed on the utilization of the existing facilities as a priority within the short term plan period.

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CHAPTER ONE

1.0 GENERAL INTRODUCTION

1.1 INTRODUCTION

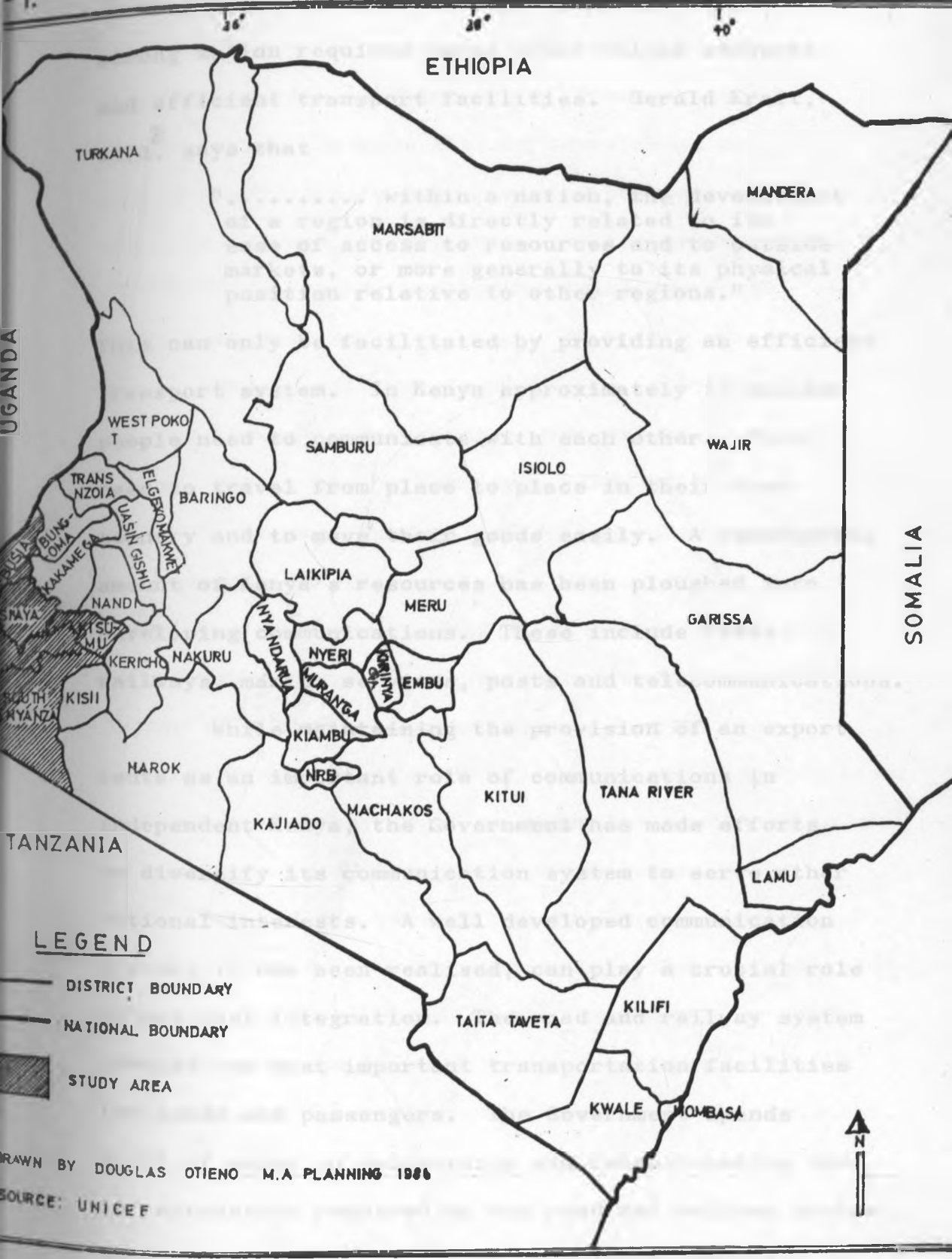
The development of a transport system is very often regarded to be of particularly significant importance for the process of economic development of a country. For any development to take place effectively in an urban or rural area, there must exist an effective transportation system to facilitate the movement of persons, goods and services, this in essence is a reflection of the relationship between a given transport system and the various land use types existing in that particular region. The idea about the nature and form of the relationship between transport and development has been a topic of considerable debate (hunter, 1968, Wilson, 1966, Storey, 1970, Hofmeier, 1973, Blonk 1979 etc). Transport is a prerequisite or a cause and a result of development. It is a two-way interaction process, depending on the type of the economy involved and the level of economic and social development at which transport is desired or effected.

Essentially, transportation can be simply defined as a means by which persons, goods and services can be moved from one place to another.[1] In this respect transportation systems are very important to the development of regions as they are designed to overcome the limitation or frictions of distance, natural obstacles etc, imposed on geographical locations.

Subsequently, transportation systems shape the distribution of activities and influence the share by which each region contributes to the national product.

Being this important a tool in development, transportation therefore, requires a thorough analytical study and proper well thought planning. Transportation planning is not a new phenomenon, but started right back in the early 1960s and has developed to the current modern transportation planning. (For more details on this refer to concepts as explained further under literature review). This particular study centres around this very subject of public water transport planning, the area under study being Lake Victoria located on the Western side of Kenya (map 1). A good example of an efficiently utilized water resource and well planned water transport system is that of the Great Lakes of North America, which is playing a vital role in the development of the lake region by providing an efficient water transport for cargo, persons and services. This study similarly aims at developing or rehabilitating the Lake Victoria water transport system so as to effectively exploit the available resources around the lake and hence promote the economic development of the immediate hinterland of the lake and if possible beyond.

P1. STUDY AREA (NATIONAL CONTEXT)



1.2 STATEMENT OF THE PROBLEM

There is no doubting the fact that the development of Kenya as an economically and socially strong nation requires among other things adequate and efficient transport facilities. Gerald Kraft, 1971[2], says that

> "..... within a nation, the development of a region is directly related to its ease of access to resources and to outside markets, or more generally to its physical position relative to other regions."

This can only be facilitated by providing an efficient transport system. In Kenya approximately 19 million people need to communicate with each other. They need to travel from place to place in their free country and to move their goods easily. A substantial amount of Kenya's resources has been ploughed into developing communications. These include roads, railways, marine services, posts and telecommunications.

While maintaining the provision of an export route as an important role of communications in independent Kenya, the Government has made efforts to diversify its communication system to serve other national interests. A well developed communication system, it has been realised, can play a crucial role in national integration. The road and railway system provide the most important transportation facilities for goods and passengers. The Government spends a lot of money in maintaining and rehabilitating the infrastructure required by the road and railway system. Both modes of transportation contribute immensely to the national economy.

In Kenya, the road transport sector has a highly significant position and priority and more emphasis has been placed on the development of road transport throughout the nation. The Roads Department under the Ministry of Transport and Communication has made lots of investments on this, and is continuing to make plans on how to improve the road network, by upgrading the low graded roads, tarmacing, marruming and by providing new roads where none exists.

The current development plan (1984-88) has directed emphasis towards the strengthening of paved roads. During the period, some roads will be up-graded while the unpaved roads already constructed will be maintained. The previous plans emphasised on the up-grading of[3] heavily used trunk and primary roads to bitumen and gravel standards and more recently on the extension of feeder roads. In 1963, the Government spent K.Shs. 93 million on road construction. The amount of money spent on roads has continued to grow so much that in 1984 alone, the Government spent K.Shs. 350 million on road construction. Another area on which Government efforts have been concentrated has been the Rural Access Roads Programme. By 1983, the programme had planned to construct nearly 10,000 kilometers of all-weather rural access roads in 23 districts.

The railways system constitute the second most important mode of transport in the country for passengers and especially bulky goods over long distances. Similarly alot of money is being pumped into developing of this sytem. The Kenya Railways Corporation, which emerged after the breakup of the East African Community, is doing all it can to get over its teething problems of paying substantial amounts of money to the official receiver of the former community. The most significant achievement of the railways system and which has swallowed alot of money has been the gradual dieselisation of motive power. There are no steam powered trains left on Kenya railways. Also a substantial additions to its fleet of locomotives, wagons and coaches have been made in 1979-83. The Corporation was, however, hit by the division of the assets of the defunct EAR &H.
As part of its efforts to make the Corporation stand on its feet, the Government waived recently a debt of about K.Shs. 150 million[5]. This will help ease the heavy financial burden on the Corporation, which worsened recently due to the debt problem.

Plans are underway to extend the railway to two proposed routes, Butere-Bungoma line and another line from Awendo to Homa Bay (estimated to cost K.Shs. 296 million)[6] branching from the Kisii-Rongo proposed line.

Of late the Government has intensified the development of its Air Transport Services. Plans are underway to expand the Government owned Kenya Airways and extensive capital investments have been deployed in expanding the three major airports, Jomo Kenyatta International Airport, Moi International Airport and Kisumu Airport, the first two ranked among the best equiped in Africa in telecommunications, radar, and other navigational aids. The Kenya Airways' expansion programme recently, on 17th May 1986, made big news in the air transport sector by the arrival of the Kenya Airways Airbus 310-300. The 195 seater was purchased at a cost of K.Shs. 54 million[7] and signifies an important milestone in the Government's efforts to equip the national airline to enable it to compete effectively. A similar Airbus is expected to arrive by September 1986. The Government has over the years realized certain specific development of air transport.

On Marine Transport, a lot of emphasis has been placed on the development of water transport facilities along the Kenyan coast. Kenya Ports Authority (KPA) established 1978 and responsible for the operation of the Mombasa Port and other minor coastal port facilities, has received most of this emphasis. The port is now being equiped to handle containers, and to cope with this containerisation, K.P.A.

has embarked on the construction of specialized container berths and the setting up of inland container terminals. Also in Kenya's list of priorities, is the development of a second port on the Coast. It is generally believed that Lamu will enjoy this special status.

It is particularly very amazing that, despite this heavy capital investments geared towards improving and developing all these modes of transport mentioned above, (Roads, Railways, Air and even Marine at the Coast) Lake Victoria, in Western Kenya, which provides another area where Kenya's marine transport potential can be tapped, has not been singled out and mentioned in any National Development Plan of Kenya, not even in the current 1984-1988 National Development Plan period. Whereas Kenya Railways is always mentioned in these plans, no mention has been made of plans for developing Lake Victoria Transport System run by the very same Corporation. The lake has only featured in other aspects of development like a water supply source and as a potential fishing resource. Plans that exist from a Government body, are those by the Kenya Railways Corporation, but these are limited only to its few ships operating on the lake, hence not comprehensive enough.

No specific policies and strategies have been formulated by the government in her National Development Plans aimed at developing this lake transport system. Some studies have been done by some foreign consultant firms giving only terms of reference, other studies have been conducted by the Ministry of Transport and Communications and the Lake Basin Development Authority, but no serious action has been taken towards any implementation. Of all the studies done on the Lake Transport, It is only the Japan International Co-operation Agency (JICA), that came up with plans for developing the Lake transport. But again, the JICA did not consider all forms of water transport but concentrated only on the Kenya Railways operated vessels.

It is my very strong contention that if this lake potential could be properly and comprehensively planned and utilized, the transport problem experienced along the lake region could be alleviated, and this could also enhance trade and agricultural activities along the lake. Due to the absence of any serious comprehensive plan for this water transport system, and recognising the importance of this resources in the development of this region if well planned and developed, I have picked on the Kenyan Lake Victoria region as my study area. The study however, focusses on the development of the water transport on the lake with an aim of planning for its

development so as to solve the transport problem and contribute effectively towards the development of the immediate lake hinterland and beyond.

In summary, to come up with strategies, programmes and policies aimed at arriving at the optional plan for this mode of transport, the study set out to investigate the following problems:-

1. The underutilization of the Lake Victoria water resource as a potential resource for water transport development. This under exploitation of this lake for transport purposes can be exemplied by:-

   a) An apparent shortage of water transport vessels to cope up with the high passenger and goods demand for an effective water transport system. The Kenya Railways Corporation, for example, currently operates only three steamers which visit a few lake piers once a day and are often very irregular (K'Odera C. 1980) Boats and Canoes currently operating in the lake are not only irregular but are apparently not organised enough to meet the demand, and they are prone to overloading and accidents.

   b) Poor terminal facilities - these play a very important part in any given mode of transport. The lack of proper terminal

facilities seems to be a problem in some landing points along the lake and a few piers get flooded during rainy seasons. The study therefore seeks to find out how many piers exist, their present conditions assessed, and identify which ones of the existing should be improved by suggesting ways and means of improving them and if necessary suggest alternative locations to be developed as landing points or piers.

c) The boats and canoes apparently operate in an irregular manner. Therefore, the study attempts to find out whether they are coordinated and if so identify the organization or agencies that are running these vessels.

d) There apparently seems to be no clear-cut marine regulations to guard against overloading, overspeeding and to look into the conditions of the water vessels on the lake.

2. There exists a transport problem along the lake of Western Kenya. This refers specifically to the road transport problem along the lake region. This problem can be seen in the light of the following:-

a) Inaccessibility to some parts along the lake due to non-existent of roads or poor road conditions.

b) The overdependence on the road transport system for both passengers and goods transportation along these major lake centres. The road transport is also viewed as relatively co. st ly in terms of fares charged, it is also irregular, prone to accidents, and takes a longer time to reach destinations because of the long distance it covers as compared to the distance covered by water vessels from the same points of origin.

c) Lack of adequate and cheap transport system for marketing of goods at Kisumu from these areas along the lake, since Kisumu town is the major marketing centre in the lake region.

3. Lack of proper well defined government polices and strategies geared towards the improvements of the water transport system on Lake Victoria and related terminal facilities to help improve the marketing of goods like fish and enhance trade within the region, consequently promoting development in this region in general.

1.3 STUDY OBJECTIVES:

Having stated the problem this study set out to examine, it is now necessary to look at the main objectives of this study, these include:-

1. To establish the different forms of water transport operating on the lake and identify their purposes and how they operate.
2. To examine the potential of Lake Victoria as a public water transport resource in transporting both passengers and goods.
3. To examine the contribution of this mode of transport to the economic development of the lake shore region, in terms of:-
   a) trade, by facilitating a cheap reliable marketing channel for agricultural produce, fish and other commodities.
   b) promoting agricultural development of the region, and
   c) providing access to major resource areas and major lake towns.
4. To examine how best the waterborne transport system can be integrated with both road and railway transport system, and
5. To analyse and plan for the development of this system by identifying the problems affecting it, and offering policy recommendations for an effective, efficient and comprehensive water transport development.

1.4 STUDY ASSUMPTIONS:

In carrying out this study certain assumptions

were held upon which the above study objectives were based. These are:-

1. That the Lake Victoria waters are currently underutilized as a potential water transport resource.
2. That the waterborne transport system on the lake if well planned and developed will alleviate some of the transport problems experienced within the Lake region.
3. That improved waterborne transport on the lake will promote the economic development of the lake region.

1.5 SCOPE OF THE STUDY:

The bulk of this study concentrates on the waterborne transport system within the Lake Victoria within the Kenyan territory, which has an area of 4,000 sq. kilometers, but the study will extend to the immediate hinterland of this water within western Kenya as is defined in Section 2.1.1 of Chapter II. However, the study also considers briefly the recently re-opened access into Uganda and Tanzania, and examines the possibilities of reviving international transport between Kenya, Tanzania and Uganda through the lake.

Within this defined study area and under the spelt out study objectives, the study has attempted to look at the following:-

1) examine the scale of demand and supply for this mode of transport and its potential for further expansion.

2) the problems affecting the development of this mode of transport from the view point of the Kenya Railways Corporation and the other forms of transport on the lake.

3) the organizational structure of the Kenya Railways Corporation that deals with the running of the water transport vessels on the lake and look at the existing situation and plans for the future.

4) the conditions of the terminal facilities and landing beaches along the lake together with the existing routes and operational traffic flows, and relating these to the resource zones within the lake itself and the region fringing the lake.

5) the efficiency and adequacy of all the modes of transport within this region in terms of:

   i) speed
   ii) safety
   iii) capacity
   iv) frequency
   v) regularity
   vi) comfort
   vii) cost
   viii) responsibility

ix) distance covered, and

x) conditions of the vessels.

These have been considered in relation to the different purposes served and the effectiveness of the service rendered to the people by the vessels.

6) to identify and attempt to demarcate the actual hinterland affected more by the water transport system.

1.6 RESEARCH METHODOLOGY:

Any research work must undergo a given methodological way of collecting data, compiling it and analysing it and finally presenting it. The methodology adopted during this study involved an assessment of the water transport situation with an aim of identifying the problems affecting it and how to solve them. The methodology therefore included the following stages:

1.6.1 DATA COLLECTION: Under this initial stage of the research various categories of sources of information were used.

1. Primary Data Collection: This involve the following:-

i) Questionaires: Two sets of questionaires were designed and administered during the research work. This is seen in Appendix I.

The first set of questionaires was designed specifically for the USERS of the three modes of transport available within the study area namely: road, rail and water. A total of 109 questionnaires were administered in this set based on a stratified random sampling method adopted during the field survey. 30 questionaires were addressed to passengers of roads transport, of these 10 were administered at Kisumu Town, 5 at Kendu Bay, 10 at Homa Bay and 5 at Mbita. 56 questionaires were administered to passengers in KR ships. To do this a 5% sample size was decided upon and was drawn from the total number of passengers in a particular ship at that particular time. This was done at each of the piers currently used; Kisumu, Homa Bay, Kendu Bay, Asembo Bay, Kowuor, Mbita and Mfangano. This was done only once at each of the piers. To complete the water transport side, 6 more questionaires were administered to a total of six passengers aboard engine boats at each of the six piers mentioned except for Kisumu. The six passengers were selected randomly from the first boat or canoes to be loaded and ready for 'safari'.

The remaining 17 questionaires in this set were administered to passengers on transit from Nairobi to Kisumu by train regardless of their destinations before reaching Kisumu. It turned out by sheer lack that 14 out of the 17 were passengers destined to Kisumu.

The second set of questionaires was designed exclusively for OWNER of road and small water vessels (boats and canoes). In this set a total of 26 questionaires were administered, of which 10 went to owners of motor vehicles (matatus and buses) at the six lake towns Kisumu, Homa Bay, Kendu Bay Asembo Bay and Mbita, and 16 questionaires were administered to owners of boats. Kisumu received 2, Homa Bay 2, Kendu Bay 2, Asembo Bay 2, Kowuor 3, Mbita 2 and Mfangano received 3. Kowuor and Mfangano received 3 each because they are not served by road transport.

ii) Personal Interviews: These were included both formally and informally. The KR Marine staff were interviewed using a formally structured interview, however, some informal interviews were also held with some Marine Officers. This part of data collection was given alot of attention since KR is the major body running organised water transport operations in the lake. Besides the KR staff, another structured interview schedule was conducted with the Fisheries Department Officers at Kisumu to extract information on fishing

activities and the operations of canoes within the lake. Another interview, informal in this case, was held with the Regional Planning Officer and other staff of the Lake Basin Development Authority at Kisumu from which alot of relevant information was gathered. Other relevant personalities from whom helpful information was obtained included,for instance,the Planning Officers in the Ministry of Transport and Communication.

iii) Another very crucial data collection method used was Personal Observations. This cannot be overlooked and plays a significant role in any research at the data collection stage. This also included photographs which were taken to help illustrate the various aspects or features that were observed during the field study and which were considered of significant importance to the study.

2. SECONDARY DATA COLLECTION:

Various published materials like books, journals and magazines have been examined which are of relevance to this study. Most of this makes part of this chapter, especially, the Literature Review, and also most of Chapter Two and three. Apart from the published materials, unpublished materials were also looked at.

Several M.A. thesis work has been reviewed on the subject matter of economic or regional development, planning and on transportation in general.

1.61.2 DATA PROCESSING AND ANALYSIS

After the data collection stage, the data was organised, processed and analysed using qualitative and quantitative statistical techniques. The data has been organised, compiled and presented in various forms like tables, charts and diagrams as is seen in the subsequent chapters. The major statistical method used in this study for comparison purposes is the Cost-Benefit analysis. It has mainly been used to show which one of the two popular modes of transport in the study area, Road and Water, has the lowest Cost/ Benefit ratio as is seen in Chapter V. This analysis therefore gives the basis and rationale behind planning for the selected transport mode.

1.7 LITERATURE REVIEW

As described earlier, transportation has been defined by most authors as simply the means by which persons, goods, and services can be moved from one place to another.

Berege E.H. (1976)[8], states that transportation is essentially a service which enables people, firms and various other entities to carry on activities at sites selected for their purposes in separated locations,

and that transit systems and their terminal facilities exist to make this possible.

Schumer(1968)[9] says that "The conveyance of people and goods from one place to another is an activity as old as humanity itself, for man has ever been on the move. Primitive man moved from place to place to seek food, protection and to satisfy a natural curiosity as to the world he lived in, and ever since then the movements of man have been on an ever-increasing scale". He sees man's limitations as to the distances that could be travelled on foot, and the quantity of goods that could be carried on his back, as leading to the invention of a great number of aids which may be termed "ways and means" of transport, and these aids have expanded in variety and capacity with the growth of populations and civilization. He further observes that the easy conveyance of men and goods from place to place has acquired great significance in modern life, and constant improvement of the ways and means is bound up with the growing standard of living.

It is generally accepted that the objective of a transportation system is to provide a reasonably cheap, safe, efficient and reliable means of moving persons, goods and services. Thus the implementation strategies and choice of appropriate modes must compromise cheapness, safety, efficiency and reliability with the other factors such as costs, social benefits, cultural and environmental attributes and design criteria.

The importance of transportation therefore cannot be underestimated. Anon (1969) sees three things as making a nation great and prosperous - a fertile soil, busy workshops, and easy conveyance of men and goods from place to place. Barabara Ward (1973)[10] in her book - "The home of Man" contends that any effective transport system must have a track, signalling system, rolling stock and terminals for goods and people.

Transportation is therefore basically viewed as a function of land use and economic activities. Transportation demand arises, consequently, from the differential functional relationship between various land uses such as movement of persons between residential areas and places of work or markets and from different and quantitative products of economic activities which generate movement of goods and services.

On the same issue Kansky, K.J. (1963)[11] notes that what is stressed is that the structure of the transportation network of an area cannot be divorced from the geographic characteristics of that area. He defines the term <u>transportation network</u> as a set of geographic locations interconnected in a system by a number of routes. This he sees as suggesting three fundamental building blocks: origins, routes, and destinations, and each building block occupying a unique georgraphic location.

To enable this transportation network defined above to be effective and efficient, the transport system has to be planned, this threfore calls for transportation planning.

William I Goodman (1968)[12], has defined transportation Planning as "the process by which transportation improvements or new facilities are systematically conceived, tested as to present and future construction". He continues that modern transportation planning emphasizes the total transportation system, rather than one or more isolated facilities. It considers all modes of transport which are economically feasible to a State, region or urban area. It considers all types of improvements, such as more efficient signal system, channelization of traffic at intersections, better signs, parking or docking facilities; major reconstruction of existing facilities,; and constructions of new facilities.

Bruton, M.J. (1970)[13], points out in his book "Introduction to Transportation Planning" that, the transport planning process is based on a range of assumptions and principles, the most basic of which area:-

1. Travel patterns are tangible, stable and predictable.
2. Movement demands are directly related to the capability of being accurately determined for some future date.

In addition to these fundamental assumptions, he notes that it has been found necessary in the light of experience to assume that;

1. decisive relationships exist between all modes of transport and that the future role of a particular mode cannot be determined without giving consideration to all other modes.
2. the transportation system influence the development of an area, as well as serving that area.
3. areas of continous urbanization require a regionwide consideration of the transport situation.
4. the transportation study is an integral part of the overall planning process, and cannot adequately be considered in isolation.
5. the transportation planning process is continous, and requires constant -up-dating, validating and amendments.

He concludes finally that given these principles and assumptions, it is evident

that if transportation planning is to be effective it must be comprehensive and coordinated with other aspects of the overall planning process.

Starkie, D.N.M. (1976)[14] on discussing "The Evolution of Modern Transport Planning" starts off by saying that;

> " the process of change in the transport system, as in any system is a complex one. The speed and level of change will first be determined by the dissatisfaction apparent in current social attitudes. These attitudes are in fact, formed by previous experiences, expectations and a more informed awareness of alternatives."

He continues that the resulting views are conveyed to the political realm, where they are synthsised by the politicians as transport problems and, probably after interaction with the technical planning system, results in the formation of broad policy with associated objectives, constraints, and values. These elements emerge from the political process with varying degrees of rigour or exactitude. The objective may, for example, on the one hand be a loosely termed remit to promote public transport, while on the other it may be a more precise intention of carrying a specific proportion of journeys by bus. Starkie, observes that the role of the transport-planner is to use his skills to transform such policies into specific proposals. These later, after further screening and deliberations within the political process, are converted subsequently into changes in the transport system. The alterations he says might then take the form of new investment in new routes, public transport fares, new vehicles,

parking charges, changes in traffic regulations, and so on.

The transportation planning process has been viewed generally as constituting of the following:-

a) Stating the objectives

b) Obtaining information

c) Analysing the information in order to determine the existing travel characteristics and travel demand.

d) Projecting future travel characteristics and travel demand.

e) Design of the system and alternative models.

f) Simulation and testing of the system/ alternative model.

g) Evaluation of the plans/models on the basis of operation and cost - benefits in terms of objectives and the projections.

h) Selection and approval of the best plan/ model.

i) Implementation of the plan

j) Monitoring and evaluation of the development.

Starkie D.N.M. models the transportation planning process as seen by Thomson (Expenditure Committee 1972 p. 164) as shown in figure 1.

As stated earlier transportation is basically a function of land use and economic activities. Transportation is seen to influence land use and land use is also seen to influence transportation. On this issue of transport and development Meyer R. and Jean, V.P. (1971) [15] view transport and agricultural development as important interdependent factors in the development.

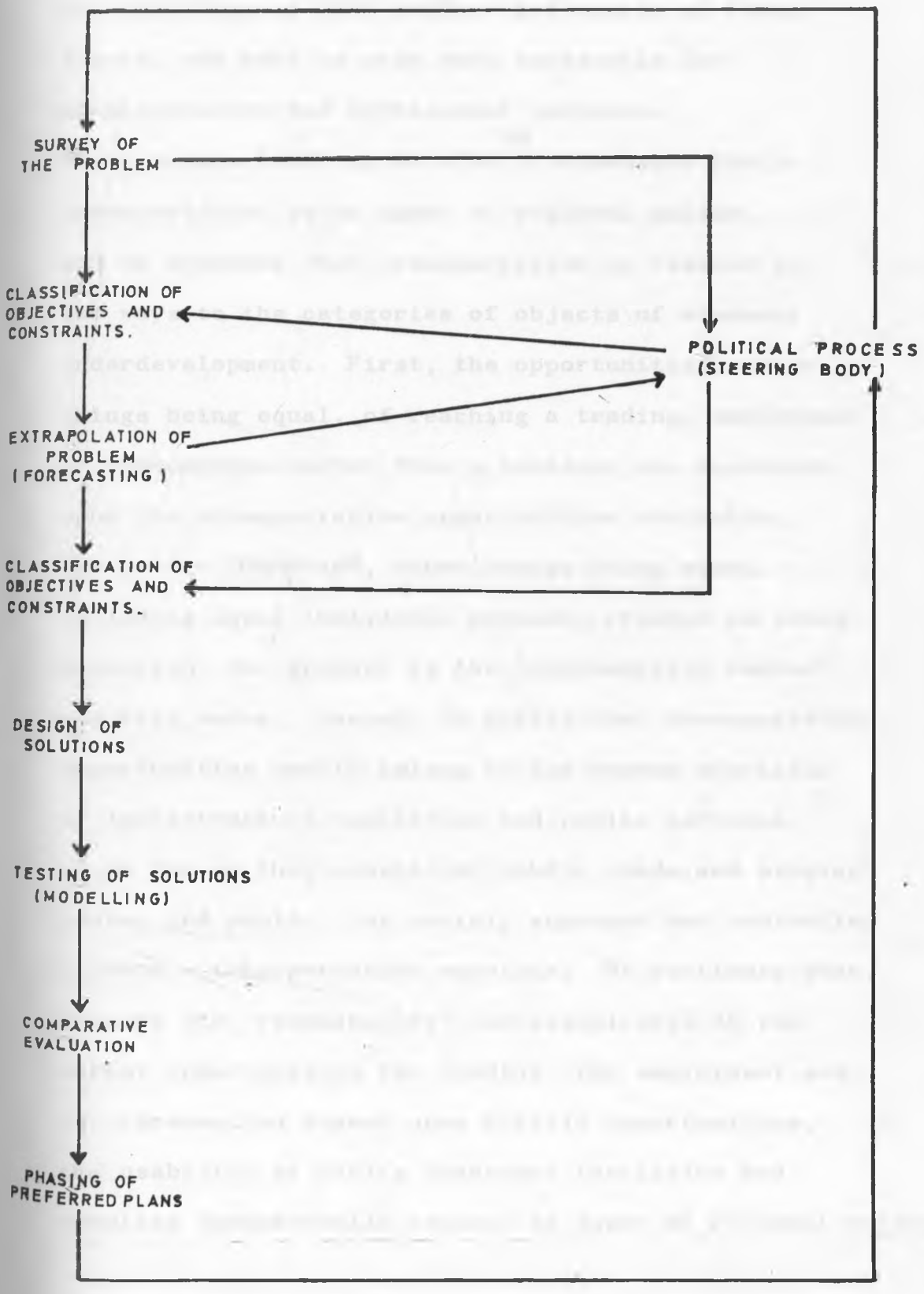


FIGURE 1: THE TRANSPORTATION PLANNING PROCESS.

of rural areas. The two authors say that road and other transport means play the role of improving the marketing of farm produce and supply of farm inputs, and make an area more accessible for administrative and development purposes.

Blonk W.A.G. (1979 pp 24 -30)[16] discusses Public transportation as an agent of regional policy, and he contends that transportation is related in two ways to the categories of objects of economic underdevelopment. First, the opportunities, other things being equal, of reaching a trading, employment or consumption market from a location are dependent upon the transportation opportunities available. The better these are, other things being equal, including equal individual economic freedom in transportation, the greater is the "reachability radius", and vice versa. Second, he states that transportation opportunities partly belong to the region provision of infrastructure facilities and public services, in so far as they consist of public roads and staging posts, and public - or pubicly approved and controlled private - transportation services. He continues that, because the "reachability" (accessibility) of the market opportunities for trading, for employment and for consumption depend upon traffic opportunities, the usability of public transport facilities and supplies fundamentally becomes an agent of regional policy.

The more easily distant trading, employment and consumption opportunities can be reached, other things being equal, the more they can serve as a substitute for those opportunities missing in the vicinity.

It is necessary when discussing the relationship of transportation and development to highlight briefly the theory of Transport and Development, as viewed by Gerald Kraft, John R. Meyier, and Jean - Paul Valette in their book "The role of Transportation in Regional Economic Development". (1971, pp. 8 - 19)[17]. They see the theoritical relationship between transport and regional economic development as derived from two somewhat related applications of international trade theory. The first one expresses the idea that the growth of a region is directly dependent on the strength of its exchanges with other regions and rests on the concept of the international trade multiplier. They feel that this aspects of the doctrine reveals little of the relationship between changes in transportation and shifts in interregional flow. The second application refers to the fusion of trade and location theories and permits an analysis of the mechanism of interregional flows of goods and commodities when the transportation cost structure is considered as a variable.

They regard the Economic base theory as the first element of a theory of transportation and development. In its original formulation the doctrine says that the growth of a small area is directly determined by its ability to market its products and services outside its boundaries. It is upon this theory that the third assumption in this study is based. One must note, however, that under strict application of base theory, the role of transportation can only be described but not economically evaluated; essentially it consists of providing the interregional geographical linkages on which the flow of export goods will be channeled.

Second is the Trade theory. Trade theory's fundamental theorem was enunciated by Ricardo (1817) in the early part of the nineteenth century. Having recognised that trade patterns and the geographical distribution of activities mutually determine each other, there would be no reason to treat trade and location theory separately. Briefly, the theory states that two areas will exchange the commodities in which they have a comparative advantage. The authors state that, once transportation costs are introduced into trade theory, the relationship between transportation and economic growth can be analysed.

Finally, is the location theory. This theory was originally developed in Europe by various independent researchers and, later, was incorporated as an integral

component of what has come to be called regional science by US economists. The theory looks at the process of locational choice of firms and recognises the agglomeration forces which attract industries towards established economic centres. It is of very little relevance to this particular study and therefore will not be examined in details.

Coming back to the subject of transportation and regional economic development, two major issues emerge from the work of Kraft, Meyer and Valette which are of relevance to this study. First is that transportation facilities overcome the frictions of space and the obstacles which geography poses to the optimal utilization of resources. Under such a goal, funds should be allocated to those portions of the transport system which, to at least a first approximation, contribute most to growth of national product. In essense, this means that transportation expenditures should be distributed geographically so that production will be attracted to locations where economic activity is most profitable. Secondly, similarly, inefficient transportation policies may historically distort the optional distribution of activities and retard the development of otherwise wellendowed regions.

Rolf Hofmeier (1973)[18] opens up in his book by stating that the development of a transport system is very often regarded to be of particular significant

importance for the process of economic development of a Country. The participation in transport activities is one of the essential basic functions that are typical for the existence of all human groups. In investigating the Tanzanian transport sector for economic development and its impact on the socio-economic regional differentiation of the country, Hofmeier notes that, its generally accepted that a certain minimum amount of transport facilities is absolutely essential to allow development of a modern economy and encourage economic growth. He further says that "it should always be clear that an expansion of the transport system is no aim in itself, at least not in an economic context," but that " it is dependent upon plans and objectives of other sectors". He views transport planning as playing a role of a servant in regard to other sectors. In various ways it has been attempted to show that transport follows economic development rather than precedes it. For this reason, he stresses that it is necessary to underline clearly that transport contributes to economic growth only in connection with many other factors. Boiling down to marine transport, one notes with much regret that very little literature is available on this subject matter. Being the main subject under study it therefore becomes a major drawback as far as literature review on this subject is concerned. Worse still is the availability of literature on inland water transport. Alexanderson

G.A. (1963)[19] p. 117) did some work on water transport along the East African Coast, and his piece of work was specifically on the old dhows along the coast and their relationship with the ports. Alexanderson says that Ports on the lake are generally places where a transfer of goods from water to land occurs although some of them also act as a locus of one or more shipping services as well as being a focus of inland road, railway routes. Such a definiation, he feels, enables points on the rugged, 2000 miles long, coastline where such transfers occur to be easily identified.

On inland marine transport in East Africa, the only available literature as far as I am concerned is paper by Luther Kusum (1967)[20] entitled "Waterborne Transportation of Lake Victoria". Luther has examined the volume of transport within the lake as at that period of time, he also looks at the major routes, origin and destination of vessels, and the volumes of goods and passengers transported between the major ports of Lake Victoria in each of the three East African countries, Kenya Uganda and Tanzania. His work is, however, very general in nature since it is just an evaluation (in the general context) of the situation as it was then. His scope is somewhat narrow as far as the demand of this my study are concerned. He concentrates more on the vessels run by the former East African Railways and Harbours, touching very bearly and very generally, on the other private means of transport available on the lake,

like motorboats and canoes. In his study, he states that in 1966 East African Railways and Harbours (E.A.R.& H.) vessels carried some 99% of the total lake traffic while the remainder was carried by privately operated crafts. He observes that private enterprise however, does not future as prominently in the lake as it used to in the pre 1940 era. That, the heavy capital outlays involved in providing adequate transport services, coupled with restrictive practice of the Railways have tended to retard the profileration of private enterprise.

However, he notes that, over the more secondary routes, where traffic offered for transport is less, private operators enjoy a significant comparative advantage and subsequently thrive. It is worth mentioning at this stage that while Luther Kusum's work covers the whole of Lake Victoria and concentrates on the vessels run by the former E.A.R.& H. and as mentioned is general and therefore narrow in scope. This particular study, on the contry, limits itself to the Kenyan waters of Lake Victoria which occupy an area of about 4,000 sq. kilometers. It also examines or treats both Kenya Railways and the privately owned motorboats and canoes as of equal significance in the Lake Transport and goes into a little more detail than Luther's work.

1.8 RESEARCH LIMITATIONS:

There are a few limiting factors which, as is

common with most research undertakings, limit the amount of data collected and, consequently to an extent reduce the accuracy of the information presented in this study. These major research limitations are as follows:-

1. The first is the time factor; the data collected during the field survey was limited by the time period during which the field research was done. The time allocated for the major field work was about five weeks, and considering the area that was to be covered the time proved too short for all the data required to be gathered. However, alot of effort has been made to fill in the gaps that were left during the major field survey.
2. This study required alot of travelling from one lake port to another using the Kenya Railways ships and also from one landing beach to another using motorboats and canoes (although due to the shortage of time not all the beaches were visited). For this reason I run out of finance since the amount allocated for the field work was too meagre to cater for all the required expenditures hence some areas which might have been worth visiting were not visited.
3. The other problem encountered during the survey was the inavailability of some crucial data.

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CHAPTER TWO

2.0 THE STUDY AREA

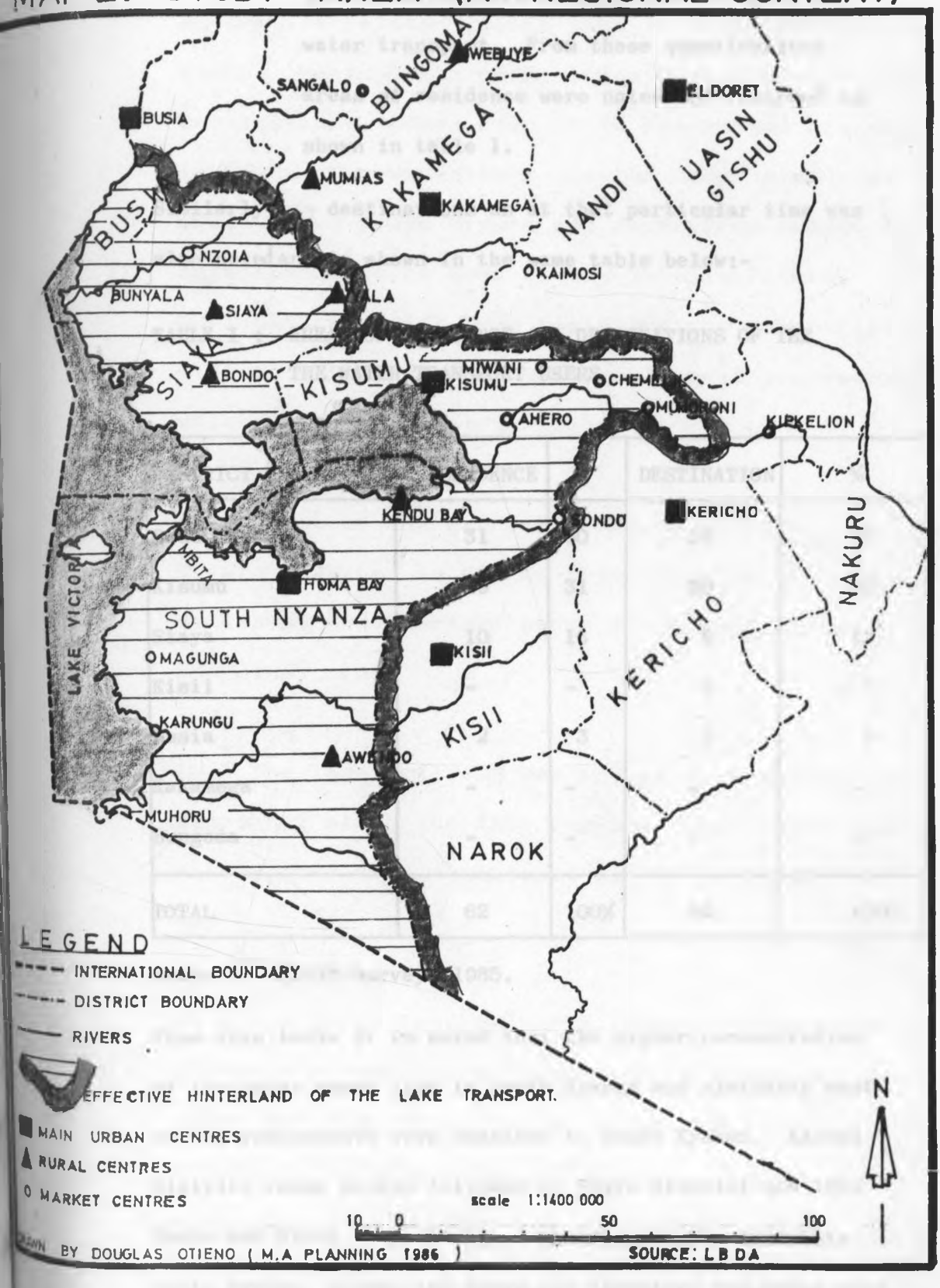
2.1 LOCATION AND SIZE:

The study area is located in Western Kenya along the Lake Victoria. It comprises parts of Nyanza and Western Provinces. It lies within 33^{o} 0' East (longitudes) and 1^{o} 15' South and 0^{o} 20' North (latitudes). This study area, as is shown in map 2, comprises of both land and water. The study examines Lake Victoria transport within the Kenyan territory which is the main focus of the study. Subsequently since the water transport affects its immediate surroundings, the land area shown on the map and which is directly affected by the lake transport forms part of the study area. The Kenyan Lake Victoria waters occupies an area of 4,000 $km.^{2}$ 1

2.1.1 DEFINITION OF THE STUDY AREA

It should be noted that whereas determining the precise area and limits of the lake was quite easy, the exact extent of the hinterland immediately affected by the water transport was not easy to demarcate with exactitude. To come up with the effective hinterland of the lake the following criteria were used to delimit the extent of the study area as shown in map 2.

MAP 2. STUDY AREA (A REGIONAL CONTEXT)



1) Fisrt,as indicated in Chapter 1, a total of 62 questionaires were administered to users of water transport. From these questionaires areas of residence were noted and recorded as shown in table 1.

Similarly destinations as at that particular time was also noted and is shown in the same table below:-

TABLE I : AREAS OF RESIDENCE AND DESTINATIONS OF THE THE WATER TRANSPORT USERS

DISTRICT	RESIDENCE	%	DESTINATION	%
South Nyanza	31	50	29	47
Kisumu	19	31	20	32
Siaya	10	16	8	13
Kisii	-	-	2	3
Busia	2	3	3	5
Kakamega	-	-	-	-
Bungoma	-	-	-	-
TOTAL	62	100%	62	100%

Source: Field Survey, 1985.

From this table it is noted that the higher concentration of the water users live in South Nyanza and similarly most of the respondents were destined to South Nyanza. Kisumu District ranks second followed by Siaya District and then Busia and Kisii respectively. The first three districts South Nyanza, Kisumu and Siaya are therefore the areas most affected by the lake transport under this criteria.

ii) The second criteria was, areas of Agricultural activities related to the lake in terms of transportation. Most of the maize transported through the lake, for instance, comes from South Nyanza and are destined to Kisumu for marketing. Cotton seeds also travel mainly from South Nyanza and Sugar from Awendo is anticipated to go down to the lake in future. Agricultural goods from Kisii and the other five districts listed above mainly use road transport which is more direct to Kisumu.

iii) Most of the general goods as discussed in Chapter IV are destined to Kisumu from other major lake ports, so Kisumu and other lake ports form integral parts of the study area.

iv) The last criteria was the area served by road transport along the lake region. This also falls within this area demarcated as the study area in map 2.

From the above four criteria, South Nyanza District, Kisumu District and Siaya Districts stand out as the areas that are more closely connected with the lake transport in Lake Victoria.

In general, therefore, Nyanza Province, with a total area of 12,525 Km^2, will form the main area of attention in this study, and together with Lake Victoria area

(4,000m^2) within Kenya this area forms the study area shown in map 2. This area however has not been treated as a closed system, or in isolation, other bordering districts like Kisii and Busia in particular, have also been on and off mentioned since they do contribute alot to these other districts but are not very directly involved when it comes to lake transport.

The information in table I has been interpred in figures 2a and 2b to show more clearly which districts along the lake has what propositions of their populations using the lake for transport purposes.

2.2 TOPOGRAPHY AND GEOLOGY

This study has adopted the descriptions of the physiographic regions of Western Kenya by S.H. Ominde (1971) in his book "Studies in East African Geography" which to my best understanding gives a more detailed study of the physiography of this study area. According to Ominde the basic structural framwork which forms the foundation for the diverse geographical characteristics is represented by two blocks of plateau lands of complex morphology separated by an east-west trending graben. The whole area bears the impact of regional deformation associated with the formation of the main rift valley of Central Kenya and the related Nyanza rift which lies in the central portion of the area.

PROPOTIONS OF RESIDENTS USING WATER TRANSPORT

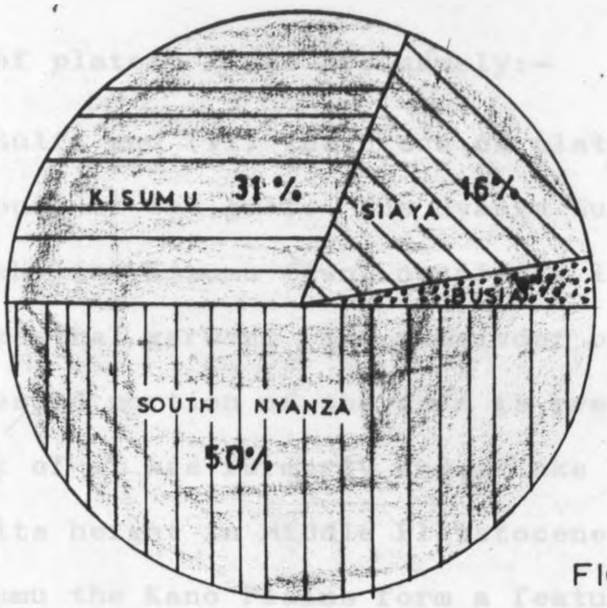


FIG. 2A

DESTINATIONS OF WATER TRANSPORT USERS

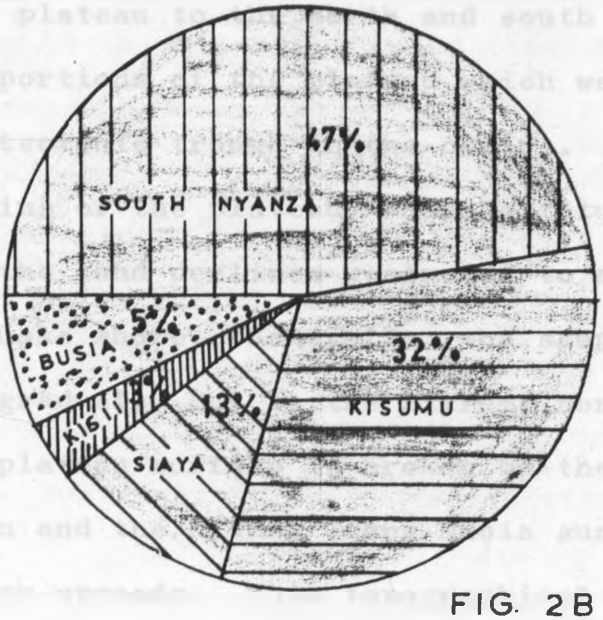


FIG. 2B

DOUGLAS	OTIENO
M. A.	PLANNING
JUNE	1986

The two blocks of plateau lands are namely:-

i) The Nyanza Gulf, and (ii) The block of plateau to the north and south of the gulf. The Nyanza Gulf at the head of which lies Kisumu town, ocupies a large portion of the central garben, The remainder of the relatively depressed portion of the area is predominanly a lowland. Most of it was formerly under Lake Victoria at the peak of its height in Middle Pleistocene. To the east of Kisumu the Kano Plains form a featureless landscape occassionally broken by low ridges and numerous abandoned river-courses. Micro-relief of this eastern lowland subdivision shows a general southerly tilt. The plains merge westwards into the fringing lacustrine lowlands of Lake Victoria.

The block of plateau to the north and south of the gulf represents portions of the plateau which were raised relative to the tectonic trough in the centre. From the eastern margins of the plateau, where altitude stands at about 2130m, the land declines westwards to about 1,158m near the Lake shore. Generally, the scope of the plateau is more gradual. But in the extreme north the gently inclined plateau surface is broken by the volcano pite of Mr. Elgon and the higher Trans Nzoia surface over which the eruption spreads. This topographical multiformity is an important factor in the human geography of the northern half of the bordering plateau.

The distrnctive altitudinal changes bring to the area a diversity which has raised its agricultural potential. South of the gulf the Kisii highlands, occuping the south-east

sections of the plateau form a distinctive unit, in common with the rest of the plateau the surface slightly decreases in altitude westwards. The Kisii highlands area is a residual surface belonging to an earlier landscape. It rises from about 1372m to over 2130m in certain places. In the extreme western margin of the plateau the continuity is broken by regional faulting and effects of volcanic episodes associated with the rift formation. The Lambwe valley is a fault-guided trench. To the east of it is the Kanyamwa Escarpment. However, west of the valley the ruggedness of the landscape is the outcome of volcanic eruptions and disintergration of the resultant landforms. The plateau therefore reaches the lake abruptly, leaving a narrow lacustrine lowland. Apart from the area of recent volcanic activities in the Elgon region ad the extreme western border of South Nyanza, the plateau is in the main an ancient pre-cambrian landscape, showing scars of long periods of denudation. In the Mt.Elgon region and in areas bordering the rift zone, tertaiary volcanic activities have provided the basis for development of soils with higher potential than over most of the plateau areas. No wonder these are now among the most intensively worked soils in Kenya.

2.3 CLIMATE

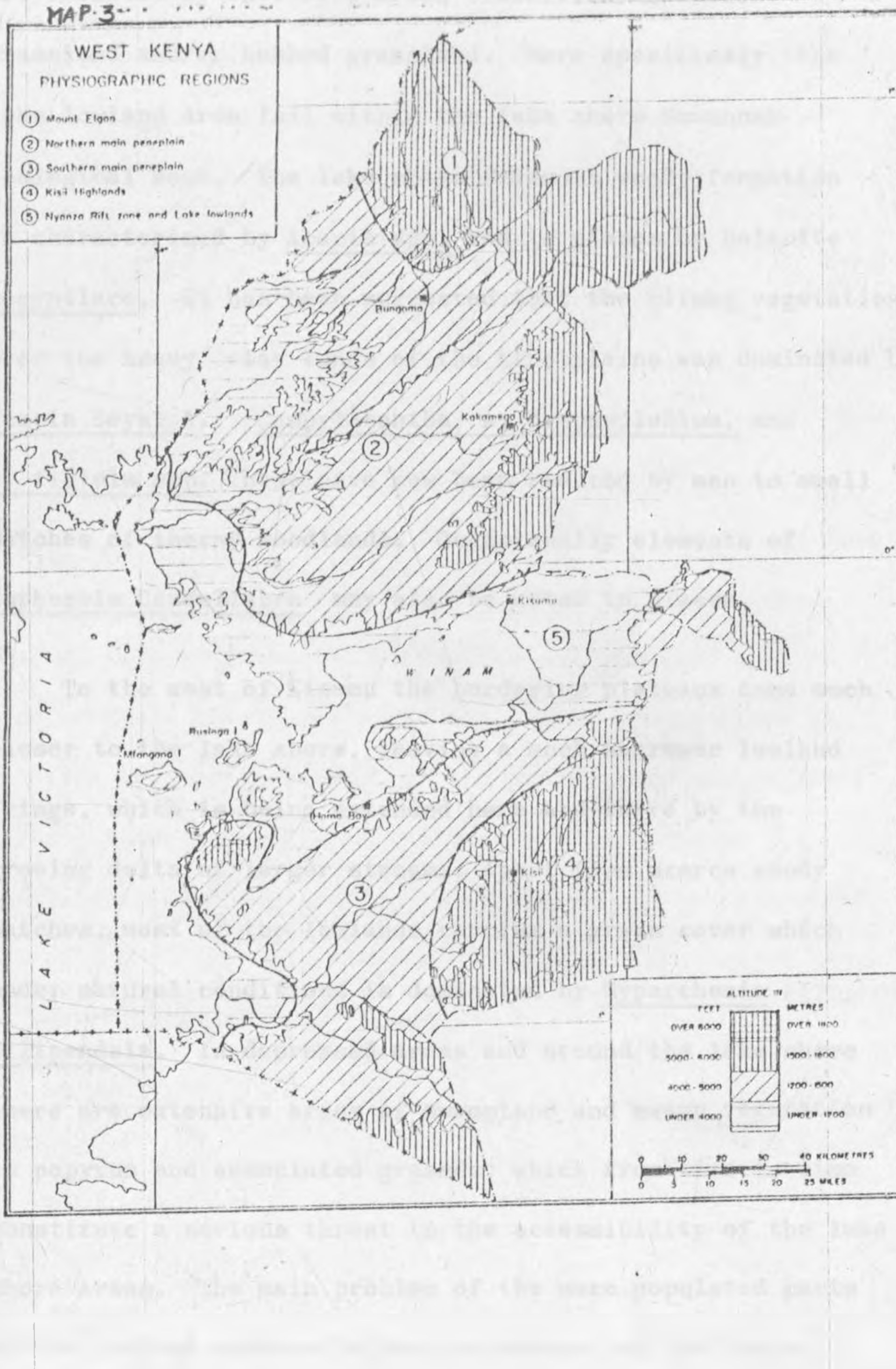
Climatically, the lowland area forms a trough of low rainfall with a mean annual rainfall ranging from 889mm. to about 1,143mm. However, measures of reliability of rainfall indicate poor proposects of receiving 762mm. in 19 years out of 20. Annual potential evaporation from

open water over a large portion of the rift floor and the areas bordering the lake in South Nyanza district is about 2000mm to 2200mm. The rift zone is thus a rainfall - deficit area where increased production depends on meeting crop needs for water during the initial growth period of the year.

There is a close correlation between the main core area of heavy rainfall and the highland massess. High rainfall is characteristic of the slopes of Mt. Elgon, the higher eastern parts of Kakamega district and Kisii Highland. In these areas, with an annual rainfall range from 1524 to 1778mm over parts of Kisii Highlands, amounts in excess of 2,052mm have been noted. The location of these core areas with soils of medium to high potential have an important bearing on the distribution of population and on the rural economy. To the north of the gulf the high rainfall areas of Mt. Elgon and the northern portions of Kakamega district are separated by corridor of relatively low rainfall, receiving between 1,270mm and 1,524mm. From Kakamega in the east there is a gradual decrease in rainfall to the lake-shore area in the south-west, where 889mm has been received. Similarly, a general descrease in the rainfall amount westwards is characteristic of the southern plateau block (see map 3).

2.4 VEGETATION AND SOILS

Ecologically the Lake Lowlands are part of the scattered Tree Grassland which extends round the north-eastern and southern sectors of the lake. A classification


MAP 3
WEST KENYA
PHYSIOGRAPHIC REGIONS
(1) Mount Elgon
(2) Northern main peneplain
(3) Southern main peneplain
(4) Kisii Highlands
(5) Nyanza Rift zone and Lake lowlands
Bungoma
Kakamega
Kisumu
WINAM
Rusinga I.
Mfangano I.
Homa Bay
Kisii
LAKE VICTORIA
ALTITUDE IN
FEET
METRES
OVER 6000
OVER 1800
5000-6000
1500-1800
4000-5000
1200-1500
UNDER 4000
UNDER 1200
0 10 20 30 40 KILOMETRES
0 5 10 15 20 25 MILES

of vegetation of physiognomic types shows that islands of forest in the eastern areas, the Gwasi hills of the South Nyanza, the region of Mt. Elgon and towards the Uganda border, are isolated by extensive areas classified as wooded grassland and/or bushed grassland. More specificaly the lake lowland area fall within the lake shore Savannah ecological zone. The lake shore Savannah woody formation is characterized by Acacia spp. and in places by Balanite aegyptiaca. It has been suggested that the climax vegetation over the heavy clay lands of the kano plains was dominated by Acacia Seyal A. Campylacantha, A. drepandlobium, and A. fistula spp. These have now been reduced by man to small patches of thorny woodlands. Occasionally elements of Euphorbia Candellabra may also be noted in places.

To the west of Kisumu the bordering plateaux come much closer to the lake shore, leaving a much narrower lowland fringe, which is being extended here and there by the growing delta of larger streams. Apart from scarce woody patches, most of the lowlands carries a grass cover which under natural conditions is dominated by Hyparchenia filipendala. In depressed areas and around the lake shore there are extensive areas of swampland and swamp vegetation is papyrus and associated grasses, which from time to time constitute a serious threat to the accessibility of the lake shore areas. The main problem of the more populated parts of the lowland areas of effective control of the large volume of water that enters the Kano plains from surrounding plateau during the main rains.

The plateau south and north of the Gulf comes a wooded grassland an/of bushed grassland. Long periods of occupance have resulted in considerable modification of the original ecology. Much of the original Vernonia Croton forest and the montane communities at higher altitudes have been cleared to make way for cultivation. The grass community of the former forested lands now includes the Cyondon Dactylon (star Grass) and such elements as Pennisetum purpurem (elephant grass). Away from the former forest lands, the plateau forms a vast surface of most savannah woodlands to which the term "High Rainfall Savannah" has been given. Here the woody elements include Combretum and Terminalia species, which are of little economic value. Range elements consists of various members of the Hyparrhenia grasses. Long periods of subaerial denudation and climatic changes have produced deeply weathered soils with predominance of laterite in certain parts. In the sandy areas and gently sloping lateritic parts of the plateau dominance of the unpalatable Cymhopogon afronarcles (lemon grass) is a clear indication of the low carrying capacity of the area in terms of number of livestock.

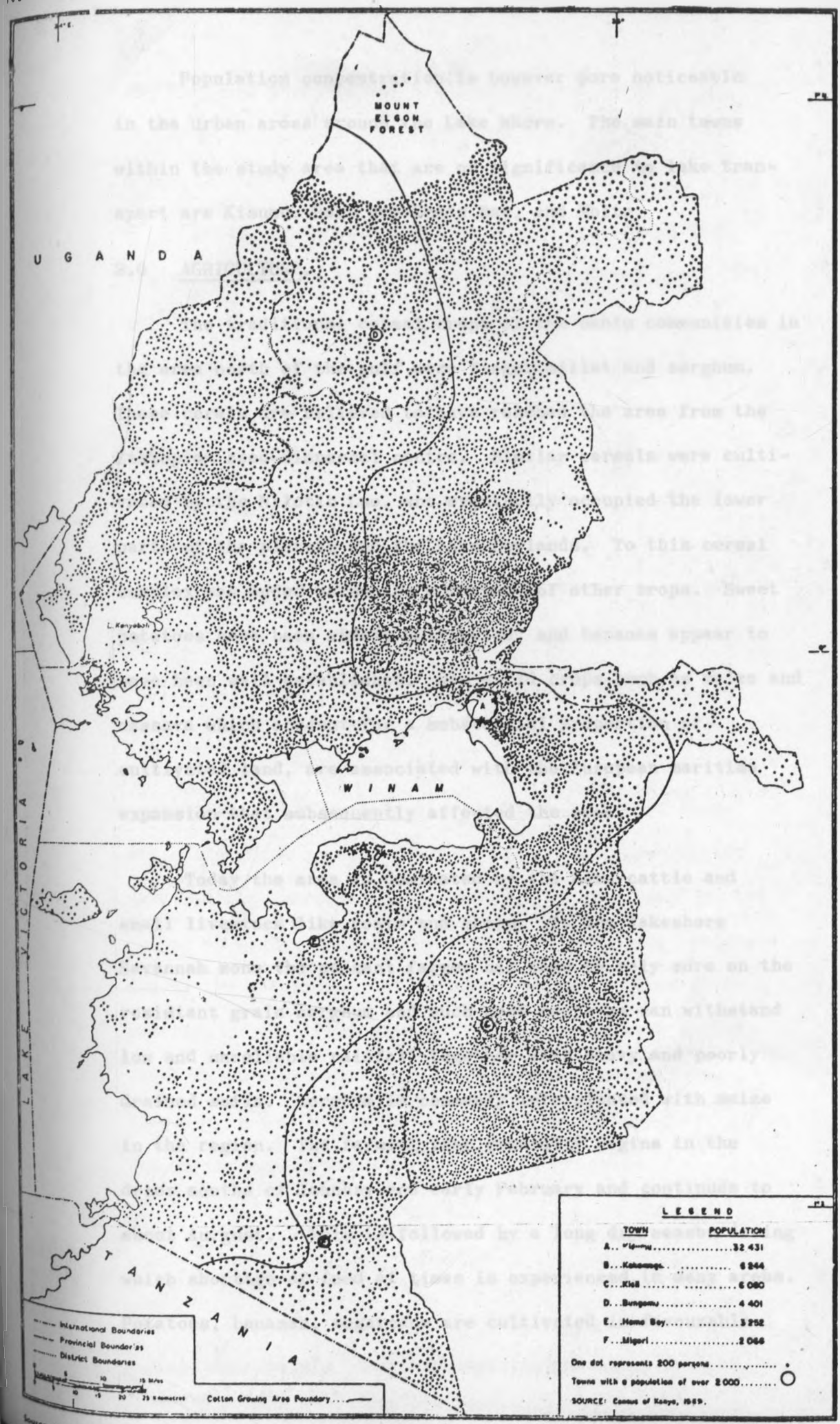
2.5 POPULATION

Culturally, the Nilotic Luo occupy most of the central, eastern and southern lacustrine lowlands. However, in the extreme west the people of Bunyala and Samia represent the elements of lacastrine Bantu population which link up this region culturally with the rest of Uganda. Over the plateau a distinct geographical location of the two ethnic groups

(the Nilotic Luo and the Bantu) are noted. North of the gulf in Western Province the Abaluhya tribe are the inhabitants. The Luo occupy the three districts South Nyanza, Kisumu and Siaya districts. In the area south of the gulf the Gusii - speaking Bantu (Kisii district) are found. According to the 1979 Population Census Nyanza Province had a population of 2,643,956 of which South Nyanza had 817,601, Siaya 474,516, Kisumu 482,327 and Kisii 869,512. Western Province had a population of 1,832,663 of which Bungoma had 503,935, Busia 297,841 and Kakamega 1,030,887. The population that uses the lake for transport purposes, excluding Kisii, Bungoma, Busia and Kakamega districts more frequently was, according to the 1979 census more than 1,774,444 people. This enormous pupulation (about 42% of the Kenyan population) has impediments such as high birth rates (3.28% in South Nyanza district.and 3.69% in Kisii district). see map on population Distribution.

For this reason means of transport is of a very important significance in this area to cater for this huge population and to promote the development of this area. A means of transport that does not interfere with the population, its settlement patterns and its economic activities would be preferable. The development of the Lake Victoria water system would therefore be very he very much in order. The projected population for Nyanza province by 1960 [5] is 4,322,686 people.

MAP 3.6 ABSOLUTE POPULATION DISTRIBUTION IN THE LAKE BASIN



Source: LBDA "A feasibility study on the production and processing of cotton" Kisumu 1980

Population concentration is however more noticeable in the urban areas around the Lake shore. The main towns within the study area that are of significance to lake transport are Kisumu, Homa Bay Kendu Bay, and Mbita.

2.6 AGRICULTURE.

The traditional cereal crops of the Bantu communities in the area north of the gulf were finger millet and sorghum. These cerals are believed to have reached the area from the Ethiopian seed-dispersal centre. Similar cereals were cultivated by the Nilotic Luo, who eventually occupied the lower parts of the plateau and the Lake Lowlands. To this cereal complex was added maize and a variety of other crops. Sweet potatoes have been widely cultivated, and bananas appear to have been well established. New world crops such as maize and cassava which account for a substantial proportion of cultivated land, are associated with the European maritime expansion that subsequently affected the area.

Today the area is dominated by the Zebu cattle and small livestock like goats and sheep. In the lakeshore Savannah zone the peasant farmer has come to rely more on the resistant grain sorghum and such good crops as can withstand low and unreliable rainfall together with heavy and poorly drained soils. Sorghum is commonly interplanted with maize in the region. The farming year generally begins in the drier months of January and early February and continues to about August. This is followed by a long dry season during which shortage of food at times is experienced in many areas. Potatoes, bananas, sugarcane are cultivated in favourable

pockets such as old river flood-plains and swamp fringes. Groundnuts as a cash crop are important in areas of lighter soils away from clay lands.

Among the serious problems of the economy in the lowlaying areas is the increasing livestock and human population. The inhabitable parts of the lakeshore region are generally overstocked and overgrazed, therefore leading to land deterioration and consequently low carrying capacity and general productivity. Above 220m the high rainfall savannah is an environment favourable for cultivation. Maize and bananas are prominent food crops on the water fringer, while at the lower levels increasing reliance on sorghum reflects more trying conditions. Cultivation of cassava as a famine relief crop has increased in importance.

2.6.1 SUBSISTENCE CROP

The most productive lands of western Kenya lie at an altitude of 1370m to well over 2130m in Kikuyu grass and staff grass zones. Though sorghum and finger millet were dominant cereals in the traditional crop complex, the coming of maize, assisted by a superior ploughing technique and by the possibility of an expert market, raised it to a position of great importance. Sorghum and finger millet continue to be grown largely for domestic consumption. Increase in population pressure has brought important change in farming practices.

2.6.2 FOOD CROPS:

1. Maize: Maize the staple food crop and continues to be the major food crop in the entire farming areas in the Lake Basin. In Nyanza Province the hectarage planted with maize during the year 1984 was 176,229 ha. dropping from 178,156 ha. planted in 1983. The greatest decline was mainly in Siaya and South Nyanza districts. This was due to the drought that occurred in 1984. The table below shows the production of maize in Nyanza Province during the two years.

TABLE 2: PRODUCTION OF MAIZE IN NYANZA PROVINCE

DISTRICT	HECTARES PLANTED		PRODUCTION (TONS)	
	1983	1984	1983	1984
KISUMU	9,796	13,772	26,449	22,310
SIAYA	42,222	36,124	82,100	65,023
SOUTH NYANZA	83,983	68,613	198,213	148,204
KISII	42,155	57,720	151,758	163,800
TOTAL	178,156	176,229	458,520	399,377

Source: Nyanza Province Annual Report 1984.

Problems in growing maize in this area especially in Nyanza Province are the following:-

i) Inadequate use of fertilizer

ii) Failure to use hubrid seeds due to inability to purchase the seeds.

iii) Low husbadry practices such as late weeding etc.

iv) Inadequate pest control especially stalk borer.

v) Occurance of streak virus disease on the crop.

Of all the food crops maize should use more of the Lake Victoria water transport system than any other food or even cash crop. There is need therefore to improve this system to efficiently transport maize across the lake.

2. Sorghum: This is the second in rank after maize in this are and a fairly resistant to drought. A total of 68185 hectares yielding 73,746 tons were planted in 1984 and in 1983 57,599 tons were produced. Production of sorghum is increasing. Currently agricultural extension sector together with the research station at Alupe are engaged in campaigns to grow certain improved varities.

3. Finger Millet: This is another popular cereal, particularly in Busia, South Nyanza and Kisii districts. It is normally consumed locally in the farm of perridge or a complete meal. In 1983 9,663.8 tons was produced and in 1984 4.588.78 tons was produced and a great decrease due to the drought in Nyanza Province.

4. Rice: Both Upland Rice and Paddy Rice continue to be grown in the Province. All the paddy rice is grown at Ahero and West Kano schemes in Kisumu district. Total production during 1984 was 10,802 towns. Acreage under Paddy Rice has remained the same over a number of years, while the Upland Rice acreage has been on the increase. The Lake Basin development Authority is doing alot to develop this crop further, a level of 14,000 hectares will be under upland rice resulting in an estimated yield of 42,000 metric tons within a 5 year period. To do this the Authority is utilizing under temporary occupancy 2,000 hectares in Area 1 of the Yala Swamp for seed bulking. 900 hectares in West Kano is earmarked for an irrigation project, once funds are available.

5. Beans: is another crop popular in this area. Hectares grown in 1984 increased to 50,180 hectares yielding to 35,910 tons. Other food crops include:

6. Green Grams

7. Cow peas

8. Cassava

9. Sweet potatoes

10 Frisk potatoes

2.6.3 HORTICULTURAL CROPS

1. Bananas: This is increasingly becoming an important food crop in this area especially in Urban centres. A total of 22,194 hectares were under the crop in 1984 in Nyanza Province, when 5280 hectares planned. Other horticultural crops include:

1. Pineapple

3. Pawpaws

4. Bressicas

5. Tomatoes etc.

2.6.4 INDUSTRIAL CROPS

1. Coffee: Robusta Coffee is produced especially in South Nyanza and Kisumu Districts. The area under the crop in 1984 was 8,349 hectares. Plans are underway to activate production of this crop in Siaya and Busia Districts. There are a total of 12 coffee factories. 3 in South Nyanza, 7 in Kisii and with loans approved for 3 new factories in Kisii and 2 in South Nyanza.

2. Cotton: is another very important commercial crop in this area but is not currently grown as it should be. The LBDA has identified a potential area for growing this crop in Lambwe Valley parts of which are currently lying idle. By utilizing this idle land it is intended to increase the production of cotton lint for the country's textile industry (i.e. Kicomi) and cotton seeds for the manufacfure of edible oils and soaps.

3. Sugar Cane: This is the major cash crop in this area covering about 120,000 hectares. The six sugar factories located in the region, viz: Mumias, Nzoia, Miwani, Muhoroni, Chemelil and Sony at Awendo together have a current output of about 400,000 metric tons of white sugar out of the country's total sugar output of 460,000 metric tons. Further improvement are underway to improve the production of the crop. The development of the Lake Victoria water system can help especially in the transportation of sugar from Awendo to

Kisumu since it offers cheap transport than travelling all round the lake to Kisumu. Other industrial crops in the area include:-

4. Sisal
5. Tea
6. Tobacco
7. Groundnuts
8. Simsim and Sunflower

6.6.5 LIVESTOCK

The potential for the development of livestock production in the Lake Basin is promosing. At present, the productivity of most types of livestock is low and there is considerable scope for increasing it.. In 1984 livestock was distributed in the province as is shown below:

TABLE 3:

DISTRIBUTION OF LIVESTOCK IN NYANZA PROVINCE.

DISTRICT	DAIRY CATTLE	BEEF CATTLE
KISII	140,881	430,748
KISUMU	2,968	233,770
SIAYA	899	303,600
SOUTH NYANZA	1,117	610,746
TOTAL	125,005	1,575,864

As is evident Kisii district leads in livestock production mainly due to its climatic conditions.

In the early days livestock was transported across the lake in dhows or big canoes but presently cattle are driven on foot around the lake to markets. With the development of this lake transport system the safe transportation of cattle acrossthe lake can be revived.

2.7 FISHERIES

The Kenyan waters of Lake Victoria are a major source of fisheries currently providing 25,000 fishermen with full time employment and part - time employment for others in auxiliary services. In the past ten years the fish catch has increased at the average rate of 2% per annum. Most of this increase has taken place recently due to the climatic rise in Nile Perch catch which now contributes up to 60% of the total estimated production of 45,000 tons in 1981. The most popular fish is 'Ngenge' the genius tilapia. The Nile Perch 'Mbuta' is not very popular among the local communities (JICA report 1984.)[7] The lake transport system is very crucial in the catching and transportation of fish and plays a very important role in this populalar activity along the lake. For this reason it has been treated very specially in Chapter IV.

2.8 TOURISM

There exists alot of tourism attraction areas within this region. The Masai Mara Game Reserve, the Ruma National Park (formerly Lambwe Valley Game Reserve), Mt. Elgon National Park and the unique Kakamega Rain Forest National Park are among the specific wildlife areas in which large varieties of fauna and flora are found. Within the Kisumu Municipal boundaries exist an Impala Park and a Bird Sanctuary near West Kano Rice Scheme. There are also a few volcanic lakes found in the area e.g. Lake Simbi, in which colouful flamingoes and aquatic birds that favour alkaline waters are abundant. Other volcanic phenomena like geysers (hot springs) offer possibilities for health spas. The Kakamega tropical Rain Forest is a home to unique species of trees, birds, reptiles and insects found nowhere else in the country. Mt. Elgon National Park provides added opportunity to mountain climbers.

Lake Victora is a special attraction being the second largest fresh water lake in the world. Establishing a well organized lake cruise would provide a proper means of travelling to most of these attraction centres around the lake by tourists.

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C H A P T E R THREE

3.0 EXISTING TRANSPORT SITUATION IN KENYA

3.1 INTRODUCTION

The basic issue in modern transport planning is the need to choose carefully between alternative courses of action. It is a problem of choosing the "best". The answer to the question of how we make better decisions has been that better choices will be made if comparision is carried out in a systematic manner. The Government, therefore, has to make the best policy decisions regarding each sector of the economy to ensure that development follows the set out policy framework. "the expression of policy objectives in planning matters in more precise economic terms is generally regarded as being synonymous with the application of social cost - benefit analysis. A policy of maximising profits, in more popular terms, commercialism, fulfils the required conditions and is used as a basis for choosing between alternative courses of action in transport.[1]"

In general, development policy and strategy includes two major issues and these are:-

i) the means to realize maximum utilization of the existing transport infrastructure, and

ii) the investment necessary for various modes to meet future transport demand.

These two are the main objectives of a comprehensive transport plan[2]:-

The Policy instruments available for use in the determination of transport planning includes:-

i) required capital investment in the transport sector and its allocation to individual modes.

ii) timing size and scale of development project over the transport network.

iii) operational improvement of tranport infrastructure, facilities and human resources.

iv) intermodal coordination such as tariff and tax adjustments, and

v) regulations and legal provisions for effective administration.[3]

A comprehensive transport policy therefore, must consider in details all the possible modes of transport within the region concerned and spell out policy objectives for the development of each sector of one particular mode of transport, indicating the programmes for action aimed at expanding and improving that particular mode and show the expected development expenditure. The policy framework should also show how effectively these modes of transport will be integrated.

In view of the above policy issues concerning transport, this chapter has examined, in brief, the transport policies in Kenya as is depicted in the

development plans. Further on, a small section has been devoted to the Ministry of Transport and Communication showing its role in the administration of transport and how it is organized. Finally, the chapter ends by giving a brief outline and overview of the existing situation of all the major modes of transport in the country, and the relevant agencies or bodies entrusted with the running of each mode of transport and working in conjunction with the Ministry of Transport and Communication. Each mode of transport has been briefly examined from the National context and then trimmed down to the local level, which in this case, is the study area. However, Inland Water Transport on Lake Victoria which is the main theme of this study, has been purposely left out in this Chapter since it is considered in all the three subsequent chapters.

3.2 TRANSPORT POLICY IN KENYA

Tranport policy in Kenya as brought out in the National Development Plans covers the development of all the main modes of transport and communication i.e. road, rail, maritime, air transport, postal and telecommunications services including the building, construction and energy sectors. These services are vital input s for all the sectors of economy, and must therefore, be developed at a rate consistent with that of the development of all other sectors.

It is stated for instance, in the National Development Plan 1979 - 1983, Part 1 that;

> "For all modes of transport, the Government will apply the principle of comparative advantage. Reliance on competition in promoting their development will encourage the use of those modes rendering services for which they are most suited[4]".

This is an indication that the Government is very aware of the significant role each kind of mode plays in development of the economy, but still, priority is given to that mode which together with other factors or activities provides the key to faster development of a particular region. In most cases this mode has been road transport. It is, for instance, further stated in the 1979-83 Plan that;

> "The transportation section devotes considerable attension to the construction and maintenance of roads[5]". (pp.409).

In the 1984-1988 Development Plan, it is stated that, since the road system and the railway provide the most important transportation facilities for both freight and passenger traffic, the plan therefore, advocates very strongly for the maintenance and rehabilitation of the infrastructure required for these two modes of transport during the plan period. The two are therefore given the highest priority.[6]
The Government has started a Rural Access Road Programme (RADP) in which rural access roads are being improved by grading, widening, and creating more roads so as to provide ease of access to resources, markets and for easy transportation of goods and passengers.

In spelling out the policy objectives for these modes of transport in the Development Plans, especially the 1979-1983 Plan, the Government has tended to examine each mode separately. Any area under each mode that is considered important but not adequately developed or requires special attention has been identified and its development proposals given priority during that specific plan period. The policy statements are not left hanging but the expected development expenditure is more often than not estimated and incorporated within the policy framework. Specific programme of action are usually outlined for each mode but in a more general form.

As already mentioned in Chapter I and as indicated above, special emphasis has been laid on the development of road transport mainly because of its role in promoting agricultural development and also because of its wide geographical coverage. The railway transport then follows, after which air and marine transport comes.

It is my obervation from the nature of the existing transport policies that while all the modes are represented reasonably when it comes to marine transport, nothing totally has been mentioned in the development plans about the Inland Water Transport on Lake Victoria. The transport policies therefore fail to meet one of the major objectives of a transport policy as highlighted

that a transport policy should be comprehensive enough to consider all modes of transport that are of significance to any given region. In this case Lake Victoria being a potential transport resource within western Kenya should be incorporated in the National Development Policies.

The policies also do not bring out clearly how the different modes of transport are to be integrated and coordinated so as to provide services to the people and promote development more effectively. In the light of these areas of weakness in the National Transport Policy, there is a very strong need for the Government to formulate policies that are comprehensive enough and includes areas such as the ones revealed above, and more so consider seriously the development of the Inland Water transport on Land Victoria.

3.3 TRANSPORT ADMINISTRATION AND ITS ORGANIZATION

In Kenya Transport administration and transport business are characterised by the following two distinguished points:-

i) Transport administration is the responsibility of more than one Ministry, although the Ministry of Transport and Communication (MOTC) plays the central part.

ii) Transport business is carried out by many parastatal bodies namely, Kenya Railway Corporation (KR), Kenya Ports Authority (KPA), Kenya Cargo and Handling Services (KCHS) and Kenya Airways (KA). A more recent body in the transport business is the Kenya Pipeline Company (KPC).

3.3.1 ORGANIZATION OF MINISTRY OF TRANSPORT AND COMMUNICATIONS (MOTC)

The Ministry of Transport and communication is in charge of the planning, designing, implementing and administering of development programmes and projects for the various modes of transport which include roads, railways, airtransport, ports and harbours, and inland waterways; posts and telecommunications services and facilities are also included. In addition, essential service, such as materials reserach and testing, meteorological services, mechanical, and transport operations and air and road licensing are under the jurisdiction of the Ministry. Railways, Ports, Airways, and posts and Telecommunications facilities and services are operated by parastatal organizations which are expected by the Government to generate revenues to maintain their operations, while road subsectors,

aerodromes, and other related services rely wholly upon the Central Government for their budgetary appropriations. Within the Ministry of Transport and Communications there are at present eight Departments and/or Divisions concerned with transport.[7]

3.4 MAIN EXISTING MODES OF TRANSPORT

The four main types of modes of public transport have been already identified as Road, Rail, Airways and Marine transport in Kenya. Road transport dorminates, followed by Railways, air and lastly marine transport. All the four have a part to play in the development of the national economy and should be regarded as equally important despite the ranking.

3.4.1 ROAD TRANSPORT

Road transport plays a very important role in the transport sector of Kenya. Of the total 1983 land traffic by rail and road as shown in table 4 "about 95% of the passenger traffic and 73% of the freight (tonnes)were transported by road in Kenya. The growth in road transport during the last decade has been recorded as about 5% per annum in terms of vehicle/Kilometre, and

is expected to continue upto the year 200.[8]"

TABLE 4: SHARE OF PASSENGERS AND FREIGHT BY ROAD AND RAILWAY TRANSPORT IN KENYA

MODE OF TRANSPORT	PASSENGERS		FREIGHT	
	Tonnes ('000')	Share (%)	Tonnes ('000')	Share (%)
Railway	2,279	5.5	4,473	27.1
Road	39,169	94.5	12,030	72.9
TOTAL	41,448	100.0	16,503	100.0

Source: JICA Report: Vol. II 1984.

Roads of all classes have been built and well developed over the past year all over Kenya ranging from Class A roads, B and C roads. At present, the national road network extends to 54,584 Kilometres of which 6,721 is paved. About 12 per cent of the roads are classified as international trunk roads (linking centres of international trunk roads) linking centres of international importance, 14 per cent as primary roads and 67 per cent as secondary and minor roads[9]. Primary roads connect important provincial centres to each other or to higher class roads. Secondary roads link locally important centres i.e agricultrual areas to each other or to minor important centres or higher class roads. And minor roads provide connections to minor centres in rural areas.

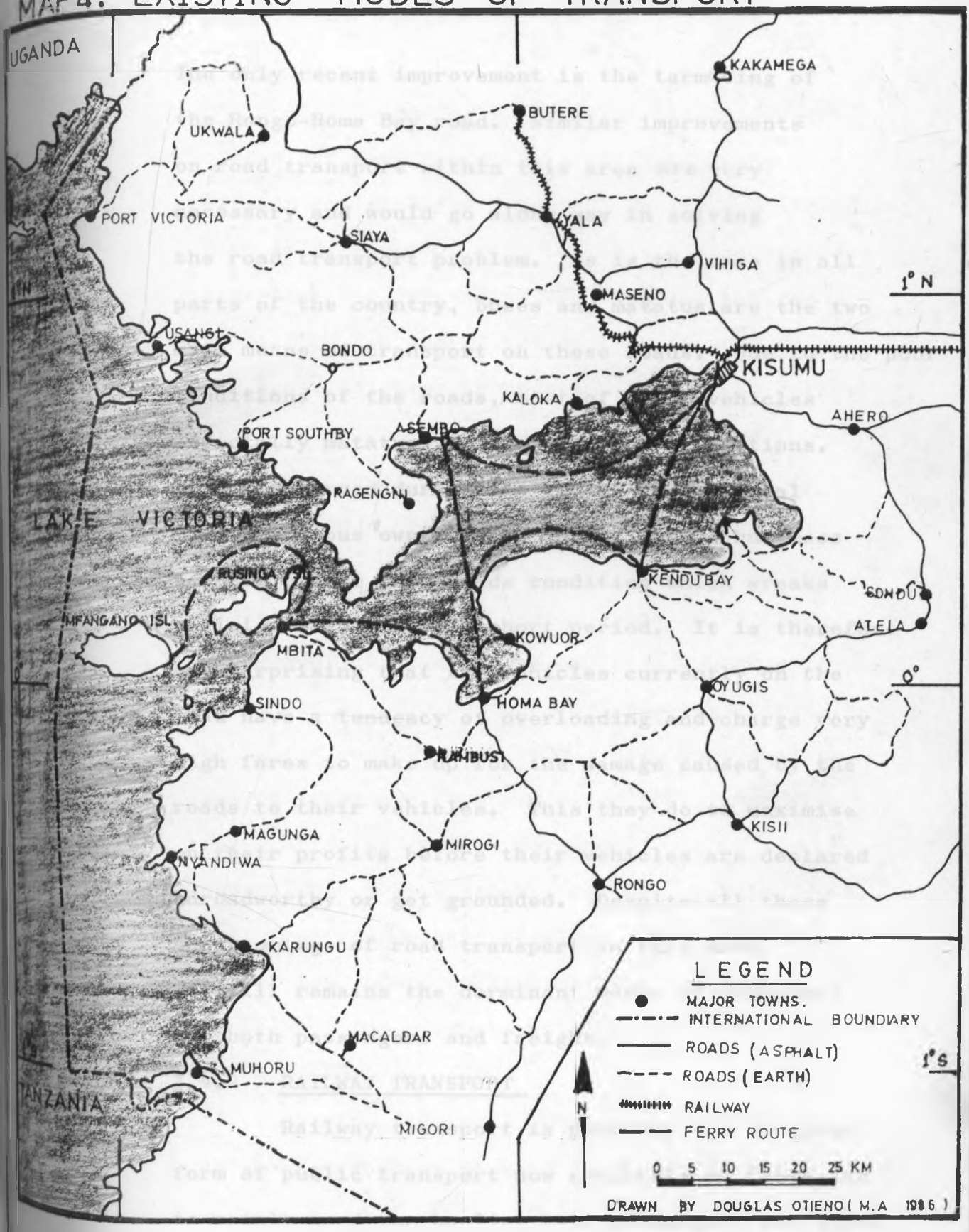
Vehicles used for both passenger and freight transport range from cars, matatus to buses, and Lorries and trucks. "The development of the road network has stimulated remarkable growth of the road transport industry. These were 240,435 vehicles plying Kenyan roads in 1980 compared to only 93,000 at independence. The number is still growing. Matatus handle a significant share of passenger road transport. A survey carried out by the Bureau of statistics in 1983 on Matatus operating in Nairobi, revealed that each Matatu collects an average revenue of £13,000 per year from fares. And in 1984, the sector contributed £22 million to GDP while the transport sector as a whole accounted for 5.6 per cent.[10] Though road transport is very important in the Kenyan economy, minor roads development has been delayed in some highly populated areas. The use of old or aged vehicles and the lack of sufficient number of roadworthy vehicles, have resulted in inefficient road transport and are thus holding down the economy. In both urban and rural areas there is a need to control the operation of matatus in order to ensure safety and efficient road and vehicle management.

Narrowing down to the study area, road transport is the main mode of transport. However, it is very dissappointing to realize that this region,

Part of which is the most populated areas in Western Kenya, is very poorly served by roads. The major roads that are Asphalt surfaced or bitumenized are from Migori-Rongo-Kisii-Oyugis-Sondu-Ahero to Kisumu. From Kisumu one branch goes to Kakamega through Vihiga, and another to Maseno - Yala to Siaya and Ukwala as is seen in Map.4. By 1982, the Kisumu Homa Bay region for instance boasted of 3320.1 Kilometres were bitumenized. Of the other Lower order roads, in the same year Homa Bay - Kisumu region had 451.4 Kilometres of Murram roads. The majority of the study area is covered with very poor conditioned earth surfaced roads which are nearly all inaccessible during rainy seasons. It is noted, for example that in terms of road lenghth per unit area, South Nyanza District is the worst served in Nyanza Province. The offshore Islands, the remote and rocky coastline areas, the black cotton soil areas and various pockets of District are poorly served with transport means.[12] This poor transport means is mainly attributed to the poor road conditions in the region surrounding the lake.

The worst hit area is the strip along the lake of about 20 Kilometres from the lake shore.

MAP4. EXISTING MODES OF TRANSPORT



The only recent improvement is the tarmacing of the Rongo-Homa Bay road. Similar improvements on road transport within this area are very necessary and would go along way in solving the road transport problem. As is the case in all parts of the country, buses and matatus are the two main means of transport on these roads. Due to the poor conditions of the roads, most of these vehicles especially matatus, are in very bad conditions. It was observed during the survey that several matatu and bus owners have fallen out of business because of the poor roads condition which wreaks vehicles within a very short period. It is therefore not surprising that the vehicles currently on the road have a tendency of overloading and charge very high fares to make up for the damage caused by the roads to their vehicles. This they do to maximise on their profits before their vehicles are declared unroadworthy or get grounded. Despite all these shortcomings of road transport in this area, it still remains the dorminant means of transport for both passengers and freight.

3.4.2 RAILWAY TRANSPORT

Railway transport is probably the cheapest form of public transport now available in Kenya and is mainly used for hauling both passengers and goods over long distances. Untill 1977 the break of the

East African Community, the three former member states had been operating jointly the East African Railways and Harbours Corporation (EAR&H). From 1978, however, each of these states has been operating its own system and assuming its own liability. In Kenya, the Railway is now run by the Kenya Railways Corporation (KR). The railway stretches right from the coast at Mombasa through Nairobi all the way to Kisumu with several lines branching from the original main line. Table 5 below shows the major lines and routes kilometres of running lines as at 1980. The amount of goods moved by train on these lines increased by 15.2 per cent and passenger traffic by 61 per cent between 1978 - 81. This healthy growth trend was reversed after 1981, when the corporation's finances worsened.[13] It is recommended that KR should now be operated on a full cost recovery principle. Its development activities should be concentrated on equiping work-shops for adequate maintenance of rolling stock.

However, the rail transport has favoured and enhanced marketing of produce, transportation of

TABLE 5: MAJOR RAILWAY LINES AND ROUTE KM. OF RUNNING LINES

MAIN LINES	ROUTE KM OF RUNNING L I N E S
1. Mombasa to Malaba	1,085.44
PRINCIPAL LINES	
1. Nakuru West to Kisumu	234.96
2. Voi To Taveta	129.96
MINOR BRANCH LINES	
1. Nanyuki Branch	233.64
2. Nyahururu Branch	76.69
3. Solai Branch	42.49
4. Kitale Branch	65.20
5. Yala-Butere Branch	69.98

Source: National Transport Plan, Vol. II JICA Rept. 1984

general cargo and passengers and above all has contributed alot to the development of the regions it serves, especially the Kenya highlands. There are plans underway to extend the railway lines to give more coverage and service to other areas.

Within the study area, the railway line passes through the area from Kipkelion to Tunnel Station through to Muhoroni, Chemelil, Kibigori, Miwani, Kibos and finally to Kisumu. From Kisumu it continues to Kisian Station, Maseno area, Yala, and finally to Butere in Kakamega District. There was a proposed extension to the Kisumu - Butere line to Bungoma, but although all the preliminary studies and work have been done, it has not been implemented yet. Another line has also been proposed from Homa Bay through to Awendo - Migori with a branch to Rongo - Kisii, and Sotik. If this is realised it will enable the tapping of agricultural and mineral potentials of this region. Especially important, is the transportation of sugar from Awendo to Kisumu. These two lines if implemented will greatly improve transportation within the study area, since the existing line facilities might not be able to transport the expected increased future demand.

It has been observed that the trend of cargo transport and passenger transport between road and railways, show that the railway share has decreased as a result of competition with road transport as indicated in table 6. So, to competently compete with road transport, more railway lines should be

added throughout the country to main resource areas as is proposed for the study area.

3.4.3 AIR TRANSPORT

There are three main airports in Kenya, Nairobi, Jomo Kenyatta Internal Airport (JKIA), Mombasa, Moi International Airport (MIA) and Wilson Airport. Of the three JKIA has the major share both in terms of the number of passengers (80%) and the volume of freight traffic (60%).[14] JKIA and MIA are presently utilized for international air transport services in Kenya.

The Government through the Ministry of Transport and Communications, is responsible for variety of air transport matters. The three departments which provide air transport services are Aerodromes Department, Directorate of Civil Aviation, and the Meteorological Department. These over the years, have contributed alot toward the development of air transport. Kenya Airways (KA) the National Airline started its operations in 1977 following the winding up of East African Airways. It leased aircrafts which were replaced by a fleet of three Boeing 707, one Boeing 720, one DC-9, and two Fokker F27 aircraft. The coming of the new Airbus

310-300 brings the total number of aircrafts operated by KQ to eight. Together with KQ, 34 foreign airlines companies operate scheduled international flight services to and from Kenya, and various foreign companies operate a number of chartered flights.

The Aerodromes Department is responsible for the maintenance and development of the two airports MIA and JKIA. It also caters for medium-sized aerodromes namely Kisumu, Malindi, Wilson and about 160 smaller airstrips throughout the country. The samller airstrips have been up-graded. These include 14 that are presently capable of handling general aviation traffic.[15] International air passengers comprise 95% of the total travellers to and from Kenya, the rest being by road, railway and sea. This shows that JKIA and MIA hold positions as the main national gateways of the public passenger transport sector in the country. The table below shows the volume of passengers handled in 1981 at the four airports.

TABLE 6: AIR PASSENGER MOVEMENTS AT FOUR AIRPORTS(1981)

AIRPORT	DOMESTIC		INTERNATIONAL		TOTAL
	Scheduled	Non Scheduled	Scheduled	Non Scheduled	
JKIA	185,000	-	809,000	-	994,000
MIA		-	54,000	141,000	
MALINDI		21,000	-	-	
KISUMU		5,000	-	-	
TOTAL		26,000		141,000	

Source: National Transport Plan Vol. II JICA 1984

From the above table, JKIA handled 994,000 passengers, MIA 352,000, Malindi 38,000 and Kisumu had the lowest.

Within the study area, Kisumu Airport is the major airport which as shown above in table 8 ranks fourth in Kenya. A part from the Kisumu airport, two have been constructed at Migori and Homa Bay towns. Other Murram airstrips exist at Macalder, Rusinga Island, Mfangano Island, Otaro Market, Koguta, Lambwe and Suneka. But these airstrips are used very rarely and mainly for official and private purposes, but not for mass public transportation. For Commercial mass transportation only Kisumu airport is used for domestic flights between Nairobi to Kisumu and from Mombasa to Kisumu by Kenya Airways mainly. But between Nairobi to Kisumu sunbird Air

Safaris also run several flights but mainly carrying tourists. The operation of Kenya Airways is shown below.

TABLE 7: DOMESTIC FLIGHTS TO KISUMU BY K.A.

FROM - TO	A/C	TIME (MINUTES)	NO. OF FLIGHTS PER WEEK	VIA	ANNUAL SEATING CAPACITY
Nrb-Ksm	F27	65	5	NON-STOP	5x52x43
Msa-Ksm	DC9/F27	335	2	TRAN-SFER	2x52x43

Source: Kenya Airways Timetable.

The annual seat capacity by Origin and Destination from Nairobi to Kisumu and from Mombasa to Kisumu are 11,180 and 4,772 people respectively. As is expected travellers from Nairobi to Kisumu are more than from Mombasa to Kisumu because Nairobi is the Capital City. Kisumu Airport has been improved with terminal facilities and a complex accomodating commercially scheduled and non-scheduled flight services. A new control tower and operations complex will soon be completed at the new site with DANIDA assistance. Presently it has facilities which meet part, if not all of the airport operational requirements for handling aircrafts, passengers and cargo. It should, however, be noted that although Kisumu airport plays a significant role in domestic air transport, it does very little in promoting transportation within the

study area. This is not abnormal since air transport is used mainly in transporting passengers and goods over long distances, but the study area is too small for such long flights which also have to be economically vaible. However, it is one of the existing modes of transport within the study area and has therefore, to be mentioned. Map 4 shows all the three modes of transport in the study area.

3.4.4. MARINE TRANSPORT AT COAST

In Sea Marine transport, KPA as stated in Chapter I is the body responsible for running the Mombasa Port andother minor Coastal Ports. The Mombasa Port is a well established modern facility and major national asset. It not only caters for foreign trade needs of Kenya, but also contributes significantly to serving neighbouring countries. In connection with containerization mentioned earlier in Chapter I, there has already been a dry cargo depot in Nairobi which handles containers. The Government has proposed to put up an inland container terminal at Malaba, on the Kenya-Uganda border. The terminal will help Kenya's landlocked neighbours reduce their transport costs.

Containerization has increasingly become an important mode of transaction in import-export trade. Kenya has embarked on it to ease its trade with the

United States, Japan and European countries where containers are in full use. To widen its port facilities, a new second port is to be constructed at the Coast and Lamu Town is likely to be the beneficiary.

The Government is to set up a national shipping line under the KPA by 1987. According to the current development plan, the shipping line should be established by the end of the current development plan. After the collapse of the Eastern Africa National Shipping Line in 1977, which was jointly owned by Kenya, Uganda, Tanzania and Zambia, Kenya had not launched its own shipping line. This is a new challenge to the Ministry of Transport and Communication. Currently, Kenya Ports Authority (KPA) and the Kenya Cargo Handling Services (KCHS) are undergoing a merger. The Government will save alot of money that has been wasted in the duplication of work by the two bodies.

One thing that should be noted here is the over emphasis that the Government has placed on the development of marine transport at the coast, while neglecting marine transport potential on the Lake Victoria.

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CHAPTER FOUR

4.0 WATER TRANSPORT ON LAKE VICTORIA

4.1 INTRODUCTION

The first objective of this study as stated in Chapter I, Section 1.3, was to establish the different forms of water transport operating in the lake and identify their various purposes and how they operate. It is mainly to this major objective that this Chapter is concerned with. In essense, this Chapter is the Analysis Chapter. It is entirely devoted to a very detailed analysis of the various forms of water transport on the lake showing their current situations and conditions.

Each form of water transport has been treated separately so as to being out each case clearly for easy comprehension. It is in this Chapter that photograph illustration have been used most effectively to illustrate some features of the different forms of lake transport that can best be understood through visual expressions.

4.2 FORMS OF LAKE TRANSPORT

The Kenyan water transport on Lake Victoria (hereinafter referred to as Lake Transport) has since the collapse of the East African Community in 1977, been restricted to

operation within the terriroty of Kenya. Any reference to lake transport will be referring to the water transport on Lake Victoria within the Kenyan waters, unless specified otherwise.

There are several types of vessels used for transportation purposes on Lake Victoria within the Kenyan territory. These include the following:-

i) Kenyan Railway ships
ii) Engine boats (out-board engine)
iii) Canoes
iv) Motor boats(in - board engine)
v) Dhows

4.2.1. KENYA RAILWAYS SHIPS:

Kenya Railway Corporation (hereinafter referred to as K.R.) operates a fleet of ships on the lake. This forms the major form of lake transport and is the dorminant and most important form of water transport currently on Lake Victoria. This is mainly due to three reasons;

i) It is the only well organised form of water transport.
ii) It is the most reliable,and
iii) It also leads in terms of the area served and the number of goods and passengers carried per year due

to their big carrying capacities.

4.2.1.1. MARINE TRANSPORT MANAGEMENT STRUCTURE

K.R. is composed of five main Departments namely the Managing Directors Department, Personnel Department, Civil Engineering Department, Mechanical Engineering Department and Traffic Operations Department. The operation and administration of K.R. ships is entrusted to the Marine transport section which is a section within the Traffic Operations Department and is based at Kisumu but reports to the K.R. Headquarters Nairobi.

The overall boss of the Marine Department is the Superintendent Marine Engineer (S.M.E.) His area of responsibility deals with the power and man power and maintenance of ship,s and under him is the Port Officer who deals with supervision of loading and off loading services of both passengers and goods. Under the Port Officer is Lake Port Foreman who is responsible for the mechanical handling of goods, repairs and servicing of machines used at the port.

The second part of the Marine Department is under the District Traffic Superintendent (D.T.S.Ø, and his main responsibilities are to provide sailing orders and to look into matters concerning

passengers and goods demand, In general, he deals with marketing. The D.T.S. responsibilities however, are not restricted within the Marine Department only but extends to the Railway transport too. The third part of the Marine Section falls under the District civil engineer (D.C.E.) and is mainly concerned with the maintenance and building of piers and their costings.

4.2.1.2 PARTICULARS OF SHIPS AND BOATS:

Before the break of the East African Community there were quite a number of ships and boats operating within Lake Victoria owned by the three East African Government - Kenya Uganda, and Tanzania. The list of these vessels is shown below in table 8.

The particulars of some of these ships especially the Kenyan owned ones are shown in table 9. From table 8 one notes that Kenya owns the largest number of ships but as indicated in the two tables 8 and 9 only a few are currently in operation. The fleet currently in operation is:-

3 passenger ships (M.V. Alestes, Reli and Kamongo)

2 tugboats and

9 lighters

TABLE 8: NAMES AND OWNERSHIP OF SHIPS AND BOATS OWNED BY THE THREE EAST AFRICAN COUNTRIES BEFORE 1977

NAME OF VESSEL	OWNERSHIP	REMARKS
M.V. Reli	Kenya	Operating
M.V. Alestes	"	"
M.V. Kamongo	"	"
S.S. Kavirondo	"	Operating but irregular
M.V. Uhuru	"	Idle
M.V. Peeda	"	For Staff & Emergency
M.V. Homa	"	Operating (irregular)
M.V. Cathleen	"	For Staff & Emergency
M.V. Tilapia	"	Under repair now (new engine)
S.S. Nyanza	"	Out of Service
S.S. Usuga	"	Out of Service
M.V. Bukoba	Tanzania	Operating (from 16/8/85)
M.V. Nyangumi	"	Operating from Jan.1985
M.V. Umoja	"	-
M.V. Victoria	"	Not running (too costly)
M.V. Kabarega	Uganda	Not operating currently

Source: Field Survey 1985.

TABLE 9 - PARTICULARS OF SHIPS AND BOATS -92-

NAME OF SHIP /BOAT	COMMISSIONED	LENGTH (Ft.)	WIDTH (Ft.)	DRAFT (Ft.)	HP	SPEED (Knots)	CAPACITY		REMARK
							PASSENGER	CARGO (Tons)	
PASSENGER BOATS									
M.V. RELI	1947	98	18	7	360	9	136	20	Engine and generator in March, 1983
M.V. ALESTES	1957	85	20	4	380	9	200	20	Engine and generator

After the collapse of the East African Community quite a number of ships have since then been idle. Three ships, M.V. Uhuru, S.S. Usoga and S.S. Nyanza, are in perfect mechnical conditions but are idle due to lack of berthing facilities within Nyanza gulf. Two other ships M.V. Homa and S.S. Kavirondo are most of the time idle, since they are operated only when there is enough cargo to warrant their sailing to other lake ports. Two small vessels owned by K.R. but not for public transport are M.V. Peeda and M.B. Cathleen, these two are used only by the Marine Staff and also put on standby for emergency services.

In essence, what all this means is that there are only three regularly operated passenger ships, namely M.V., Reli Alestes and Kamongo. Appendix II shows the details of these ships. It particularly shows that the three ships are reasonably well equiped with most of the necessary gear for sailing and carrying of passengers. Each of the three ships is equiped, for instance, wish life saving equipment for any emergency, and besides these each ship has, on board between five to six well experienced able sea men plus a couple of ordinary seamen. These makes the K.R. Ships the most reliable and safe form of water transport on the lake in case of accidents or any

mishaps. Of the three ships, M.V., Reli seen in plate I being serviced at Kisumu dry dock, is the smallest of them all followed by M.V. Alestes. These two are the fastest of the three with a speed of 9 knots per hour. M.V. Kamongo shown in Plate 2 at Mbita pier is the largest of the three and the slowest too with a speed of 6 knots per hour. It, for example takes seven hours between Kisumu and Homa Bay and another seven hours from Homa - Bay to Mfangano Island.

4.2.1.3 PASSENGER TRAFFIC ON K.R. VESSELS:

The ships currently ferry passengers and their freight between seven lake ports namely i) Kisumu (ii) Homa - Bay (iii) Kendu-Bay (iv) Kowuor (v) Mbita (vi) Asembo Bay, and (vii) Sena (Mfangano Island). As shown in Map 5 which shows all these Ports, two other lake ports, Karungu and Muhuru were before the break of the East African Community Operational, but were later stopped due to the high costs involved as is explained further in Section 5.4.4.

The majority of passengers commuting between these lake ports are mainly inhabitants of the area immediately along the lake, although a few come from distant places like Busia, Kakamega,

MAP 5. MAJOR PORTS & EXISTING SHIP ROUTES

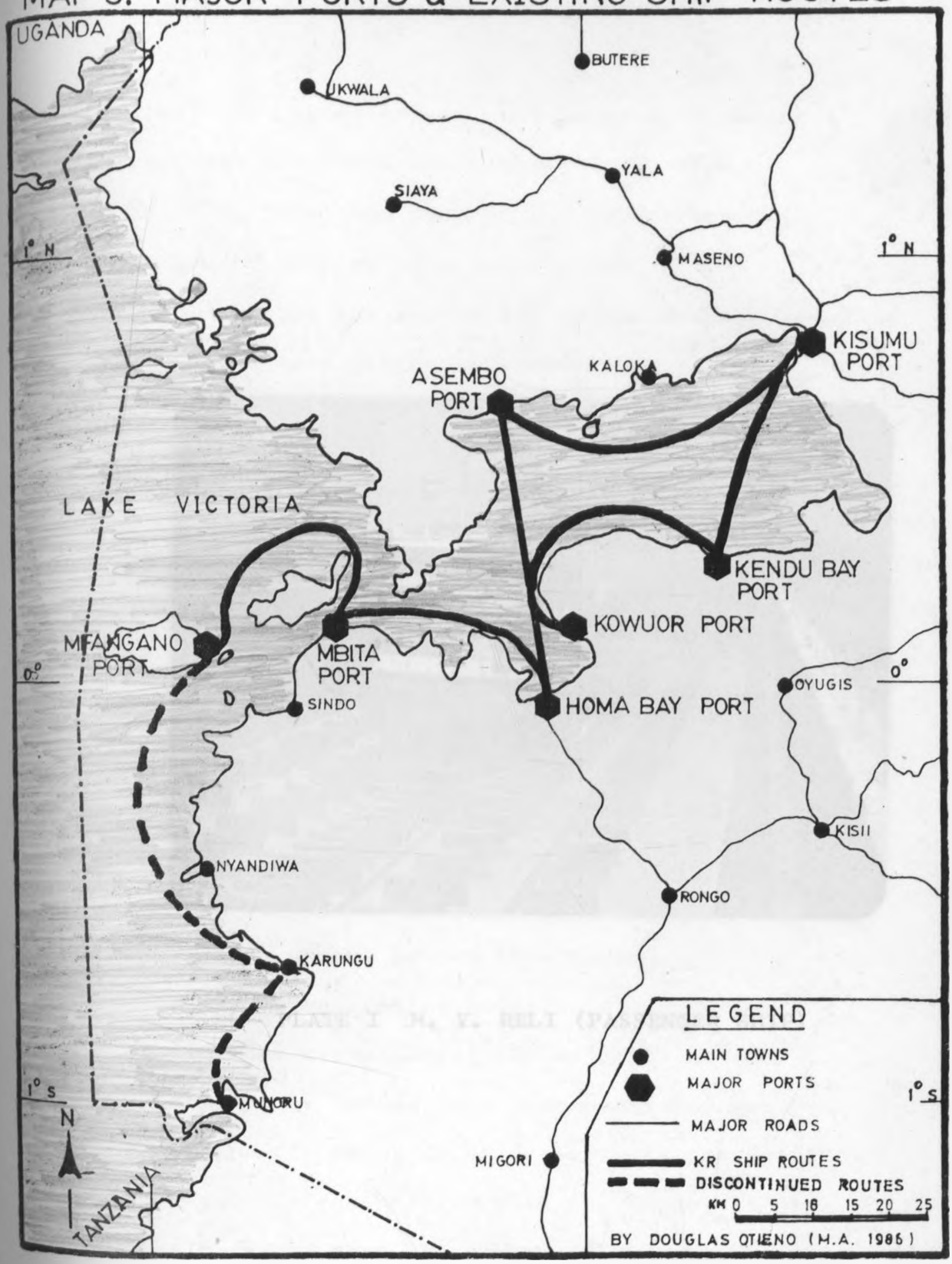


PLATE I M. V. RELI (PASSENGER SHIP)

Kisii and Migori areas. The passengers coming furthest are those who come by train from Nairobi, to Kisumu and use the Lake transport to reach their various destination.

During the survey 93% of those interviewed indicated they prefer lake transport to road transport due its safety, larger capacity, relative cheapness, security of goods and comfort. However, despite these advantages only 26% of the respondents were regular users of the lake transport. The remaining 74% were regular users of Road transport. The reasons for this unexpected outcome were given to be the following:-

i) The K.R. ships are too slow

ii) They are few, therefore not frequent enough

iii) They serve only a few areas of the entire Kenyan lake region.

What the above finding entails is that, though (93% of the respondents) the majority of the people prefer to use lake transport they are not currently using it effectively as they would wish to. In conjunction with the above, it was also observed that the number of passenger using the K.R. vessels fluctuate from time to time, but

in most occassions the ships carry barely half of the maximum passenger carrying capacity. On some occassions the situation is quite the opposite with passengers too many that some have to be left behind. Such an occassion is shown in Plate 3. It was, however, not easy to make a good follow up of the passengers coming to Kisumu from other lake ports since K.R. Corporation has a problem in following passenger transit through the piers.

It was, however, noted that the ships carry more passengers when leaving Kisumu Port, followed by Homa-Bay Port and Kendu-Bay. After the break of the East African Community in 1977 the number of passengers went far down as to reach 124,814 passengers in 1978, there has been a gradual increase in number of passengers with a peak in 1981.

TABLE 10: NUMBER OF PASSENGERS BETWEEN 1978 - 1982

YEAR	NUMBER
1978	124,814
1979	139,889
1980	167,848
1981	177,729
1982	139,602

Source: K.R.

Regardless of 1982 drop, sources from K.R. confirmed that the number of passengers since 1983 has been increasing reasonably.

PLATE 2 M.V. KAMONGO (PASSENGER SHIP) AT MBITA PIER

PLATE 3 OVERCROWDING AT LAKE PORTS

4.2.1.4 CARGO TRAFFIC ON K.R. VESSELS:

Besides passengers, the K.R. ships also carry lots of cargo from and to Kisumu from other lake ports. Looking at the history of cargo movement within the lake between 1975 and 1985, the records show that from 1975 to 1977 there was a remarkable yearly increase of cargo with 1977 being the peak,but as from 1978 the figures in tonnes went down tremendously upto 1983. Since then there has been an increase in cargo mainly due to the streamlining of the Lake transport by K.R. The sharp drop from 1978 as shown in Table IIa, b and c was due to two reasons:-

i) The collapse of the East African Community and secondly

ii) The leading commodity with a peak of 38,435 tonnes in 1977 was maize, this commodity due to poor slow services of the lake transport and because of the competition of road transport between Kisumu and Kisii, in 1979, was shifted to road transport.

It is expected that with the presidential directive that maize be transported through the lake and with

TABLE 11 (a) CARGO MOVEMENT BY THE LAKE TRANSPORT (FROM LAKE PORTS TO KISUMU)

	1975	1976	1977	1978	1979	1980	1981
	-	35,449	38,435	15,240	15,241	-	-
	553	3,668	1,163	-	45	-	-
t	313	1,710	67	-	113	-	-
dnuts	615	321	244	454	1,361	-	-
Fibre	605	-	-	-	1,585	2,199	1,653
ls & Luggage	-	70	810	426	458	472	551
Fish	-	5	222	46	202	313	403
n Seads	-	-	-	-	-	1,701	326
ture	-	-	-	-	396	605	398
& Skin	-	-	-	-	-	76	53
al Goods	20	293	402	280	507	664	612
	2,126	41,516	41,343	16,446	19,908	6,030	3,996

TABLE 11 (b) CARGO MOVEMENT BY THE LAKE TRANSPORT (FROM KISUMU TO LAKE PORTS)

	1975	1976	1977	1978	1979	1980	1981
t	1,728	1,160	1,740	1,505	7,358	7,229	6,535
ls & Luggage	220	331	406	612	250	244	360
nal Effects	49	24	14	26	134	286	-
	1	32	30	57	102	667	217
ay Material	-	150	-	-	446	-	80
Sheet	-	-	-	-	15	106	265
al Goods	877	842	772	647	861	695	1,224
	2,875	2,539	2,962	2,847	9,166	9,227	8,681

BLE 11 (c) - CARGO MOVEMENT BY THE LAKE TRANSPORT (TOTAL)

	1975	1976	1977	1978	1979	1980	1981
OM KISUMU	5,001	44,055	44,305	19,293	29,074	15,257	12,677
(0977:100)	11	99	100	44	66	34	29

URCE: KR Kisumu District Annual Report

URCE: Adapted from KR Kisumu District Annual Report 1982 Tables 1-2-1, 1-2-2 and 1-2-3

proper improvement of this water transport system, maize will eventually be transported by the ships which offer the cheapest safest and more reliable means of transporting of such bulky goods.

Table 11a and 11b and similarly table 12, show the variety of goods transported through the lake. As expected general goods take about 30% of the total goods transported between the lake ports. Table 12 and 13 show the goods despatched from Kisumu to other lake ports and from the lake ports to Kisumu. Cement is the only commodity that attracted attention especially after cereals had gone to road transport. Cement amounted to more than 50% of the total (in/out of Kisumu) movement. Recent major commodities shipped through lake Victoria include sisal, dried fish and cotton-seed. As seen in the two tables cargo from Kisumu are mainly destined to Homa-Bay, while the majority of goods received at Kisumu comes from mainly Homa-Bay followed by Mfangano (mainly dried fish) and then Kendu-Bay as per the data presented in table 13.

In spite of the increase mentioned earlier, the total volume of cargo has fallen to less than

TABLE 12: SUMMARY OF GOODS DESPATCHED FROM KISUMU PIER TO THE UNDER MENTIONED PORTS DURING JULY & AUGUST 1985, (FIGURES IN TONNES)

COMMODITY	KENDU-BAY	HOMA BAY	MBITA	TOTALS
General goods	276	280	-	556
Parcels	43	31	-	94
Cement	129	122	-	251
Timber	49	58	-	107
Furniture	8	18	-	26
Printing paper	-	6	-	6
Machinery	31	50	-	81
G.I. Sheets	76	76	-	152
Nails	19	27	-	46
Poles wood	12	46	-	58
Oil Goods	2	8	-	10
Wines & Spirit	-	4	-	4
Personal Effects	57	79	-	136
CT No. Medicines	5	2	-	7
TOTAL	707	827	-	1,534

Source: K.R. Marine monthly Report 1985.

TABLE 13: SUMMARY OF GOODS RECEIVED AT KISUMU PIER DURING JULY AND AUGUST 1985 FROM OTHER LAKE PORTS (TONNES).

COMMODITY	ASEMBO BAY	KENDU BAY	KOWUOR	HOMA BAY	MBITA	MFANGANO	KARUNGU	TOTAL
General Goods	3	52	1	440	-	21	-	508
Dry Fish	-	110	20	350	70	156	-	700
Parcels/Luggage	-	39	3	73	7	56	-	174
TOTAL	3	201	24	863	77	233	-	1382

Source: K.R. Marine monthly Report, 1985

10% since the fall of E.A. Community. It would only be fitting for economic reasons and to ensure proper utilization of the lake transport, that cargo within the region come down to the lake. For this purpose, it is essential to augment the capacity of the lake transport.

4.2.1.5 PASSENGER AND CARGO EARNINGS:

In terms of earnings, passengers bring more money to the K.R. than cargo. For instance as shown in table 14 the four vessels that operated during August 1984 brought a total of passenger earning amounting to K.Shs. 254,407.75 excluding earnings fetched from catering services rendered to the passengers which also amounted to K.Shs. 48,945.45. The passenger earnings alone is far much above the cargo earning which was during the same period K.Shs. 54,651.00

4.2.1.6 TERMINAL FACILITIES:

To be considered under this section, are all the existing lake ports and the various facilities and equipment existing at each port. There exists the following lake ports within the Kenyan lake region.

i) Kisumu port
ii) Homa-Bay Port
iii) Kendu-Bay Port
iv) Kowuor "
v) Mbita "

VESSEL	VOYAGE NO.	NO. OF PASSENGERS	DISTANCE COVERED (KM)	PASSENGER EARNINGS	CATERING SERVICES EARNINGS	CARGO EARNINGS
M.V. RELI	13	5,135	3,120	118,037/-	11,387,70	-
M.V. ALESTES	12	4,685	3,068	106,481.50	6,506.75	7,073
M.V. KAMONGO	5	1,447	1,471	29,143.25	31,051.00	28,144.00
S.T. KAVIRONDO	2	11	364	746.00	-	19,434.00
TOTAL	32	11,278	8,023	254,407.75	48,945.45	54,651.00

SOURCE: FIELD SURVEY, 1986.

vi) Asembo Port

vii) Sena Port

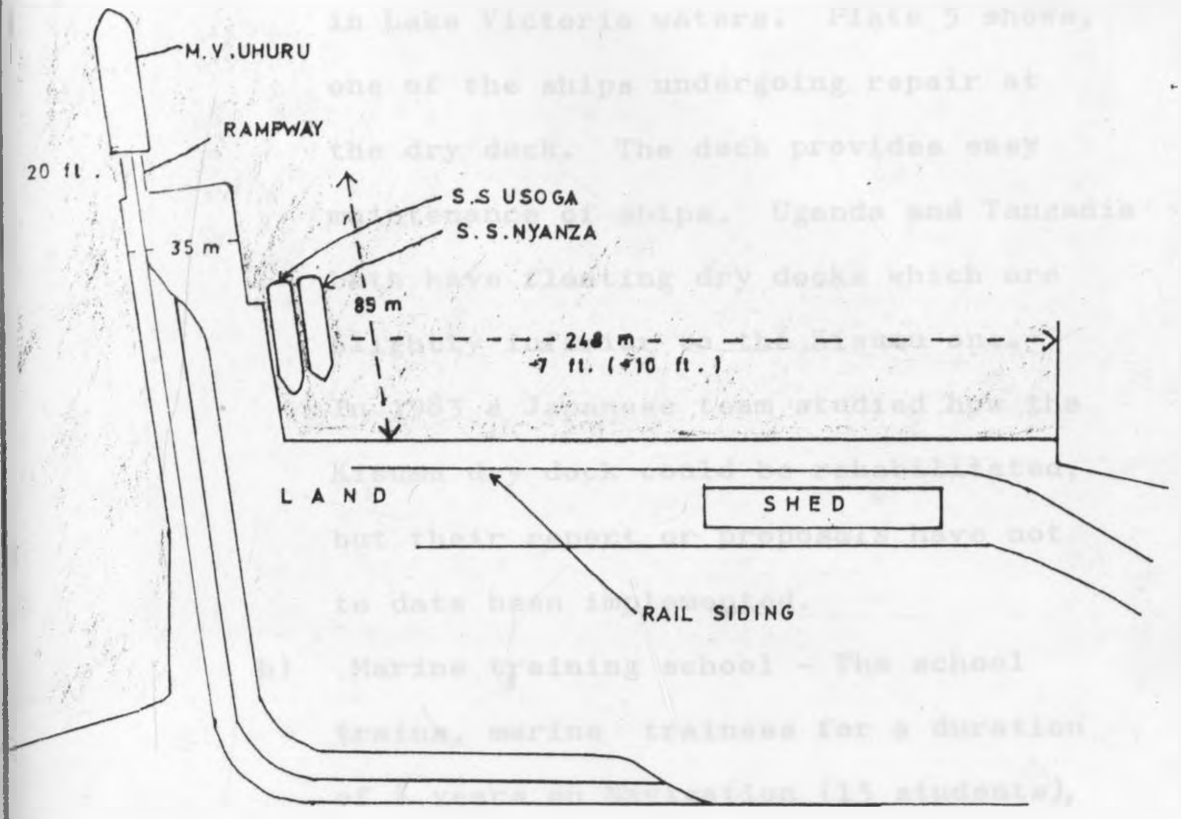
viii) Karungu Port)
ix) Muhura Port) No longer in use
x) Port Victoria) by K.R. ships.

1. a) Kisumu Port

The transport centre of the lake transport is Kisumu, which is located at the north east end of the Winam Gulf. The railway trank line from Nairobi directly connects with the lake transport there. Among the lake ports, Kisumu is the only one worth mentioning as a port since it has sufficient capacity and ample facilities to handle any increase in volume of both passengers and goods expected in the future. A view of the Kisumu port can be seen in Plate 4 and in figure 3 showing a sketch of the port. Although the port is well equiped, the existing facilities completed when the wagon ferry M.V. Uhuru was commissioned in international lake transport in 1967, have remained unchanged. Neither remodelling nor expansion has been done.

Some of the facilities at the port include the following:-

KISUMU



HOMA BAY

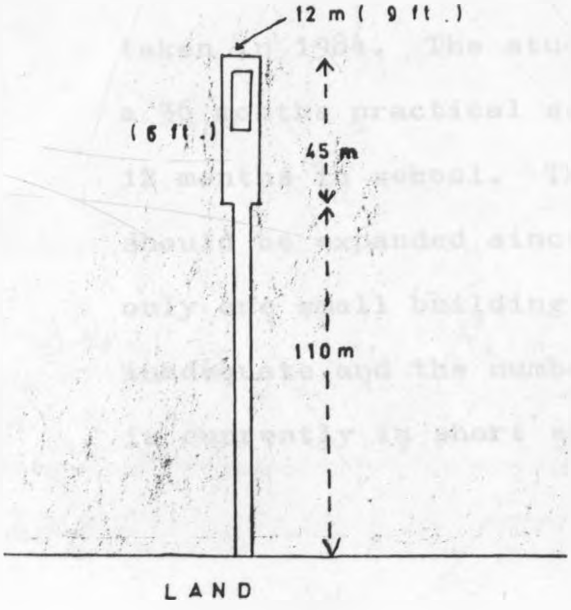


FIGURE 3. ROUGH SKETCH OF LAKE PORTS

a) Dry dock - this is the only dry dock in Lake Victoria waters. Plate 5 shows, one of the ships undergoing repair at the dry dock. The dock provides easy maintenance of ships. Uganda and Tanzania both have floating dry docks which are slightly inferior to the Kisumu one. In 1983 a Japanese team studied how the Kisumu dry dock could be rehabilitated, but their report or proposals have not to date been implemented.

b) Marine training school - The school trains, marine trainees for a duration of 4 years on Navigation (13 students), Engineering (10 students), and Atisans (10 students). The first lot of students since the collapse of the E.A.C. were taken in 1984. The students undergo a 36 months practical sea service and 12 months in school. The school, however, should be expanded since it consists of only one small building block which is inadequate and the number of instructors is currently in short supply.

PLATE 4: A VIEW OF KISUMU PORT

PLATE 5: M.V. RELI AT THE DRY DOCK

c) Mechanical handling equipment at the port include, 3 cranes, 2 fork lifts and a tractor for pushing wagons. These are used at the pier, locoshed and the goodshed. These too, are not adequate for handling future increase of goods.

d) Two slipways are installed where the railway joins the port and is connected to the wagon ferry for loading and offloading purposes. Other facilities at the port include.

e) Carpentry workshop

f) Paint workshop

g) Rigger workshop

h) Fitter workshop

i) Electric workshop

j) Construction workshop

k) Fire fighting section

l) Test workshop

m) Tailoring workshop

h) Dispensary

o) Copper smith workshop

p) Blacksmith workshop

q) Booking office, store for goods and waiting room.

PLATE 6 HOMA BAY PORT

PLATE 7 KENDU BAY PORT

2. Homa-Bay Port

This is the next most important port to Kisumu. It has a small jetty with a narrow caseway jutting into the sea is as shown in Plate 6 and the sketch in figure 3.

The port consists of a booking office, two streamer clerks, a store with a weighting machine and a toilet. The jetty, though raised up and does not get flooded during rainy seasons, is most conducive for passenger handling, but not for heavy cargo handling.

3. Kendu-Bay Port - This port is more or less similar to Homa-Bay port but has two piers, an old one and a new one. During dry spells the bay is not good enough for both passenger and cargo handling and the ships have to anchor way out in the lake because the bay is shallow. The port has one big store with several National Cereals Produce Board's stores adjucent to it as seen in Plate 7. There is also a booking office and a toilet. The jetty similar to that of Homa-Bay jutts out into the lake.

4. Other Ports - include Mbita, Kowuor, Asembo-Bay Sena and Karungu Bay. All these have fewer facilities. Their construction were completed between 1975 and 1978 and as can be seen in Plates 8, 9 and 10 of Mbita Kowuor and Sena, the jetties are very small indeed and only Kowour has a small building which serves as a booking office and a store.

The Kisumu, Homa-Bay, Kendu-Bay, Mbita and Karungu ports are all parts of major Urban centres of the lake regions, with Kisumu as the provincial headquarters of Nyanza Province. For this reason, the goods and passengers from the Urban centres are in part dictated by the immediate populations of these towns and their surroundings, consequently they rank higher than the other smaller ports attached to no Urban settlements, like Sena, Kowuor etc, in terms of passengers numbers from and to these ports.

There are several small villages around the Winam Gulf, however, most of these are only slowly developing and have small populations with no direct immediate connections with the lake ports.

PLATE 8 MBITA PIER (top left)

PLATE 9 KOWUOR PIER

It should be noted that, the growth and development of towns such as Kisumu, Homa-Bay, Kendu-Bay and Mbita have a direct contribution to the development of the terminal facilities within their jurisdictions, this is so because the development of the ports will be part and parcel of their territional growth and development. It is not surprising therefore to find that most of the ports for the above reasons and because the Urban settlements are focal centres for users of lake transport, and are located where there is already a sort of Urban settlement. The K.R. has followed this line of arguement by proposing the following existing landing beaches for future development into ports, Lwanda Kotieno, Kisegi, Nyandiwa, Sindo and Karungu.

4.2.1.7 OPERATION SCHEDULE OF THE EXISTING FLEET

The operations schedule of the three regular ships is outline in Appendix III. M.V. Alestes, which moves between Kisumu port - Kendu-Bay Kowuor - Homa - Bay and to Asembo Bay and then back through the same route to Kisumu, takes two days to complete that one voyage. In one month it makes 13 voyages covering a distance of 236 miles per voyage and carrying an average total figure of 4,685 passengers per voyage making for K.R. an average figure of K.Shs. 106,481.50 per month (computed using August 1984 figures from K.R.)

M.V. Reli also follows the same route as M.V. Alestes, but is a day behind. It makes 13 voyages in a month, covering a distance of 236 miles per voyage, with 5,135 passengers aboard on average per voyage, and makes an average figure of K.Shs. 118,037 per month (figures computed using August 1984 data from K.R.)
M.V. Kamongo makes the least number of voyages due to its very low speed. It operates on a different route between Kisumu, Kowuor, Homa Bay, Mbita and Mfangano. And from Mfangano it makes three trips to Homa - Bay and back to Mfangano before it finally sails back to Kisumu to finish one voyage in six days. It therefore makes 4 complete voyages in a month covering 62 miles per voyage with an average figure of 1,447 passengers and collecting a total of about K.Shs. 29,143.25 per month (computed from date of August 1984 from K.R.).

It is evident from this operational schedule that each of the existing operational ports is visited only once per day by a ship towards a particular destination. This has resulted in poor service to the people who therefore turn to road transport which can take them to any of their desired destination at any time they wish.

A particularly pathetic aase is that of Mfangano Island where there is no other mode of transport apart from the ships, and the only ship, M.V. Kamongo, that operates to this island arrives there late in the evening and stables until the next day when it leaves only to Homa-Bay through Mbita and back to the island for three consecutive days. So it means the inhabitants of the island destined to Kisumu can only travel to Kisumu only once in a whole week.

4.2.1.8 TRANSPORT COSTS

Of the two major modes of transport within the lake region (water and road transport), water transport is the cheapest in that it offers very fair and reasonably low fares between its areas of operation. Appendix IV shows the passengers fares charged between the lake ports for first class, second class and third class. It was observed that nearly all the passengers prefer to use third class sitting facilities because as can be seen in Appendix IV the fares are very cheap. The only rare exceptions, are passengers arriving on first or second classes by train at Kisumu who are to continue their journey through the lake. These are the rare few who are accommodated in first and second classes.

The K.R. does not very strictly observe the utilization of these classes since only third class is popularly used, and only M.V. Reli has first class, the other two have only second and third classes.

Table 15 shows a comparisons of both water transport and road transport fares and the time taken between similar points along the lake. The lake transport fares used for comparison are third class fares.

TABLE 15: A COMPARISON OF TRANSPORT COSTS AND TIME TAKEN BETWEEN DIFFERENT LAKE POINTS BY ROAD AND WATER TRANSPORT MENAS

LAKE PORTS	WATER TRANSPORT		ROAD TRANSPORT	
	COST	TIME	COST	TIME
Kisumu Kendu Bay	12.00	2 Hrs	21.00	2 hrs
Kisumu Asembo Bay	25.00	2 hrs	15.00	45 min
Kendu Bay Homa	12.00	3 hrs	9.00	1 hrs.
Homa Bay - Mbita	10.00	3 hrs	15.00	1½ hrs
Homa Bay - Kisumu	18.00	5 hrs	28.00	3 hrs

Source: Field survey, 1985.

From the above table, lake transport is comparatively cheaper than road transport especially over long distances. But when it comes to time taken between

certain points road transport is much faster than water transport. This is mainly because the ships are very slow. With improved speed it will definitely be much faster to travel by water since there are no unnecessary stop overs once a ship has started on a particular journey as is the contrary when it comes to road transport, and secondly, ships travel on a relatively short distance between similar ports as compared to the distance covered on road between the same points.

Tug boats and lighters, however, have no regular operation schedule. Their services are dictated by the amount of cargo that is available at one port and ready for transhippment to other destination.

4.2.2. ENGINE BOATS:

The second most common form of water transport within the lake are engine boats. These are slightly larger than the ordinary canoes as seen in Plate II, but instead of oars for paddling they have an outboard engine attached to their rear end. These engine boats are quite a number within the lake. Records from K.R., which is responsible for registering and licencing of any motorized vessel in the lake, shows that there are currently 140 engine boats registered as shown in table below and the graph in figure 4.

PLATE 10 SENA (MFANGANO ISLAND) PIER

PLATE 11 ENGINE BOATS

TABLE 16: NUMBER OF ENGINE BOATS REGISTERED BETWEEN 1959 & 1985

YEAR	NUMBER	YEAR	NUMBER
1959	3	1973	-
1960	9	1974	15
1961	1	1975	-
1962	2	1976	-
1963	3	1977	2
1964	-	1978	-
1965	3	1979	-
1966	1	1980	-
1967	-	1981	-
1968	-	1982	-
1969	-	1983	2
1970	61	1984	5
1971	5	1985	25
1972	1	-	-
	TOTAL		140

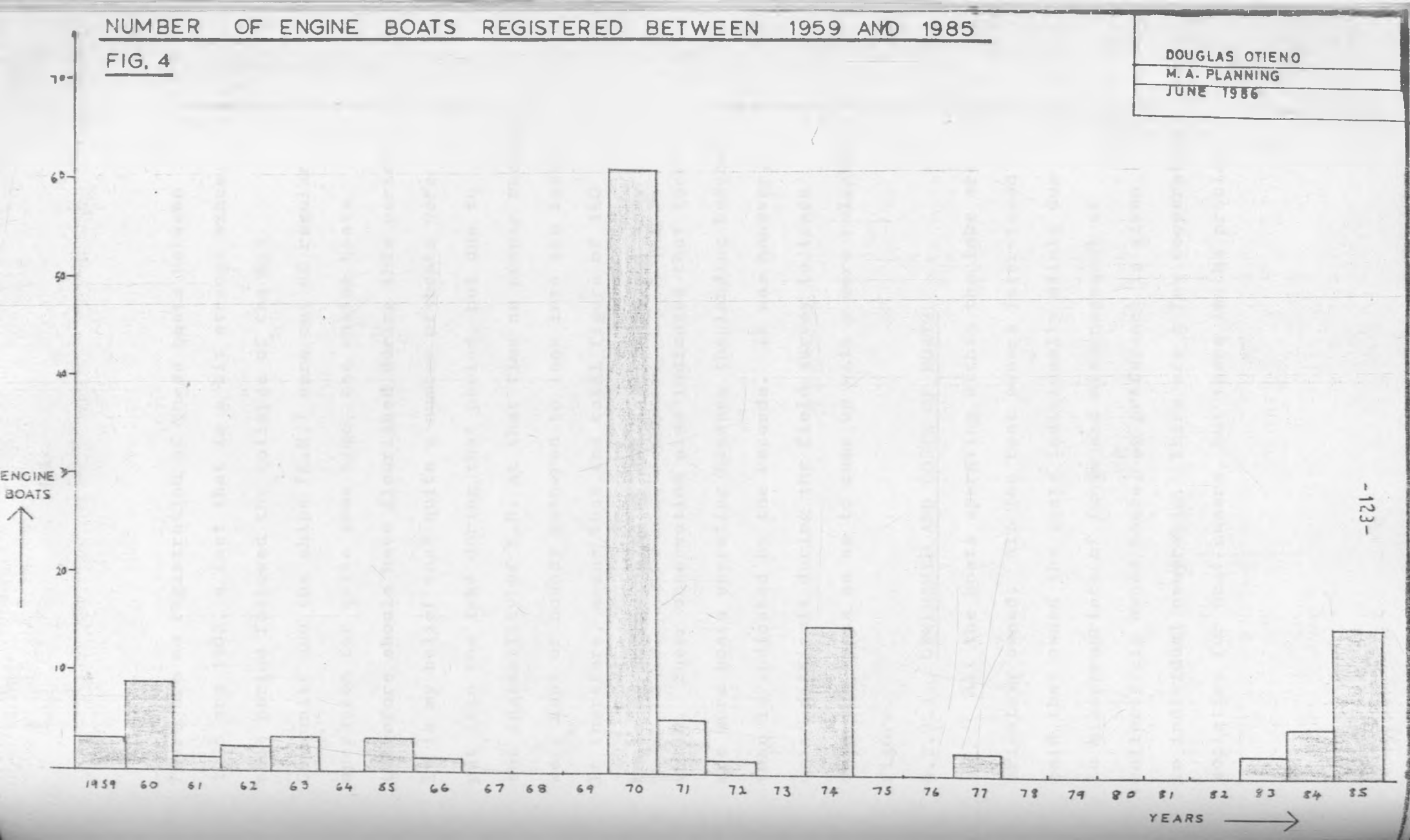
Source K.R.

From the above table and figure 4, one notices that the registration of these engine boats over the yearstakes no particular pattern. The only striking features brought out are that the highest registration was experienced in 1970. (61 boats followed by 1985 (25 boats).

NUMBER OF ENGINE BOATS REGISTERED BETWEEN 1959 AND 1985

FIG. 4

DOUGLAS OTIENO
M. A. PLANNING
JUNE 1986



There are no registration of these baats between 1978 and 1982, a fact that is a bit strange since this period followed the collapse of the E.A. Community and the ships (K.R.) were out of regular operation for quite some time, the engine boats therefore should have flourished during this period. It is my belief that quite a number of boats were put into the lake during that period, but due to the instability of K.R. at that time no proper records were kept or nobody bothered to look into the issue. It therefore, means that the total figure of 140 boats is according to my own assessment not very valid. Sheer observation also indicates that there are more boats operating between the landing beaches than is indicated by the records. It was however, quite difficult during the field survey to track down the boats so as to come up with a more reliable figure.

4.2.2.1. OWNERSHIP AND COSTS OF BOATS

All the boats operating within the lake are privately owned. All the boat owners interviewed said they owned the boats individually mainly due to misappropriate of funds and mismanagement of collectively owned boats, so preference is given to individual ownership. There are a few cooperative societies for boat owners, but there is the problem

of no proper coordination and leadership so people are reluctant to join them.

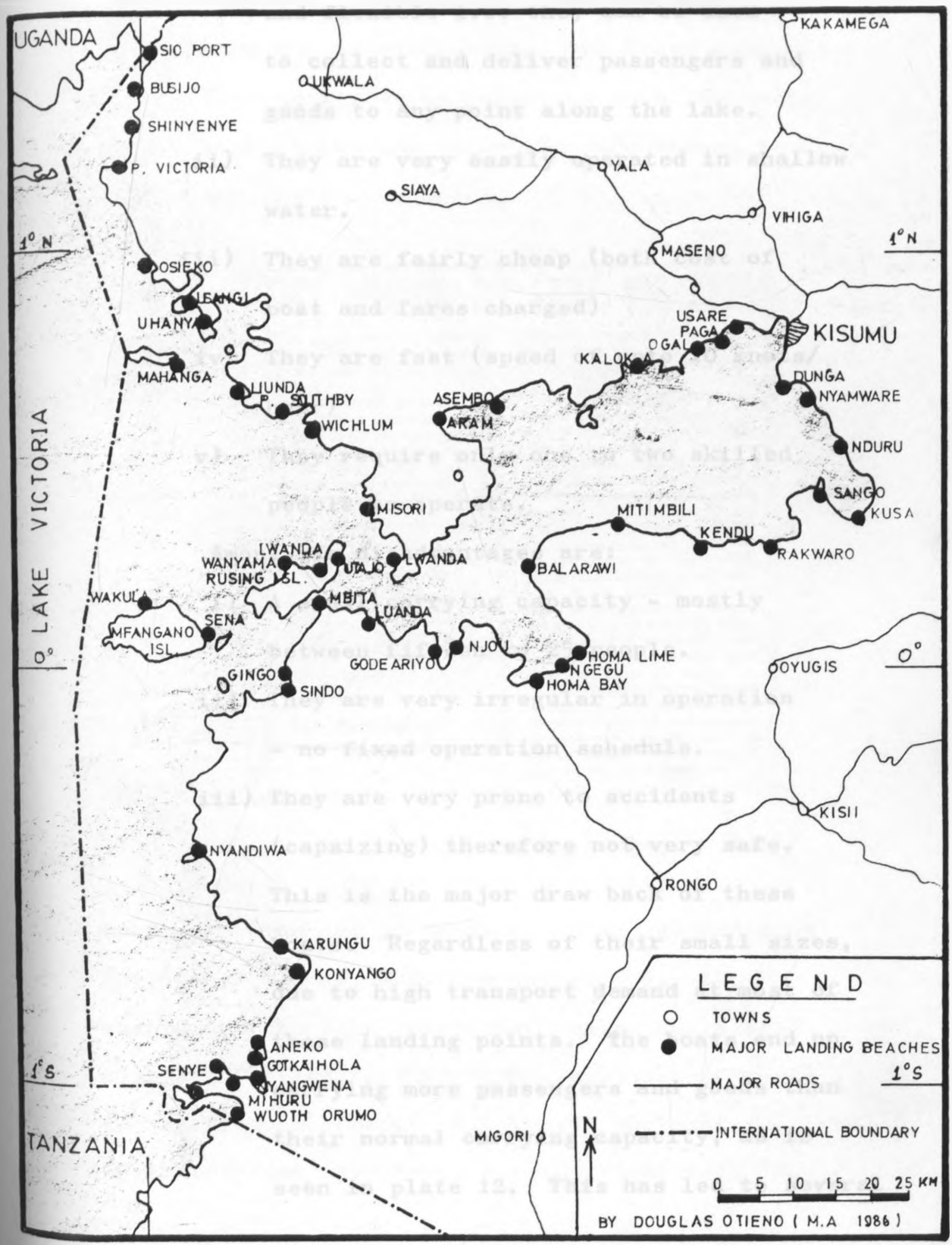
The boats themselves without engines are farely cheap because they are made locally using indeginous trees, but there are a few made of fibre glass. The cost of the boat alone ranges between K.Shs. 3,000/- to 6,000/- since they are of various sizes. The cost of the engines also vary due to their various sizes and performance of the engines, for instance, a 15 horse power engine costs about K.Shs. 40,000/- and a 7 horse power engine costs K.Shs. 14,500/-.

4.2.2.2. OPERATION OF BOATS

The engine boats are exclusively for passengers and goods. They are not involved in fishing, but can be used to transport fish within short distances, esp. dried fish. These boats operate between several landing beaches within the Kenyan lake waters. The major landing beaches are shown in Map 6. The existing lake ports, already mentioned, offer very good landing points for the boats and at the same time enables them to compete very favourable with the K.R. ships.

The engine boats have quite a few advantages that has enabled them to survive competition by canoes and even K.R. ships, these include;

MAP 6. MAJOR LANDING BEACHES.



i) They are very easily maneouvarable and flexible i.e. they can be used to collect and deliver passengers and goods to any point along the lake.

ii) They are very easily operated in shallow water.

iii) They are fairly cheap (both cost of boat and fares charged)

iv) They are fast (speed of upto 10 knots/ hour)

v) They require only one to two skilled people to operate.

Among its disadvantages are:

i) A small carrying capacity - mostly between fifteen to 25 people.

ii) They are very irregular in operation - no fixed operation schedule.

iii) They are very prone to accidents (capsizing) therefore not very safe. This is the major draw back of these boats. Regardless of their small sizes, due to high transport demand at most of these landing points the boats end up carrying more passengers and goods than their normal carrying capacity, as is seen in plate 12. This has led to several

deaths of passengers over the past decades, when due to overloading, the boats capsize. Newspaper stories reporting such incidents such as the one below are very common in our daily newspapers.

FIVE DROWN ON LAKE VICTORIA

FIVE people drowned when the boat in which they were travelling on Lake Victoria capsized early this week.

The accident occurred on Monday when a passenger boat carrying 15 people capsized. Ten of the passengers were rescued but the bodies of the five dead have not been recovered.

Motor boats belonging to the Fisheries Department have been deployed in the search for the missing bodies but so far without success.

The boat, belonging to Mr Mwira Abongo of Mfang'ano Island, was sailing from the Mfang'ano pier to Rangwe beach in Kakuingiri Location in Mbita.

Meanwhile, the DO for Mbita, Mr Richard Rakuoni, has sent a message of condolences to the families of the deceased persons.

● Twelve men who were on routine patrol in the Indian Ocean cheated death when their boat "R. V. Shakwei" started tilting at Mida creek in Watamu and they jumped into a life boat.

They were all saved but their personal effects and the boat disappeared into the ocean.

Nairobi police reported that on Wednesday at Kenyatta National Hospital Ward 30 a woman, aged 63 years, who was suffering from cancer hanged herself using a rope in the ward bathroom.

SOURCE: Daily Nation 2nd May, 1986.

Engine boats form the only daily means of transport from and to Mfangano Island seconded by the one slow ship, M.V. Kamongo of K.R. It should therefore be noted that engine boats are a very important form of water transport not only to the Mfangano people, but to the whole of the lake region for its advantages already highlited. However,

the number of people who are in this boat business is restricted because very few people can afford to raise the amount of money required to purchase an engine boat especially the engine itself. For this reason, the majority of the people along the lake who would like to venture into this business start with canoes first and then much later after enough funds have been accumulated they buy the engines. The canoes therefore are quite many in the lake. Fishing nets in the lake was found to be a major threat to engines.

4.2.3. CANOES ("SESSE" FISHING CANOES)

Canoes forms the third important form of water transport, and is particularly important since it is part and parcel of the whole business of fishing within the lake. Canoes are simply boats made of timber but with no engines. They move on the water wing either wind that pushes it using sails made of pieces of aanvas or ordinary cloth attached to a mast (as shown in plate 13) or by simply paddling it using oars as is seen in plate 14. Some are of the same size as the engine boats, but a large number are smaller.

It is totally impossible to talk about canoes without draging in fishing per se. This is simply because practically all the canoes in the lake are used mainly, if not wholly, for fishing purposes.

PLATE 12: A CANOE WITH A MAST CARRYING PASSENGERS.

For this reason the two are inseparable and has been treated so in this section.

4.2.3.1 CANOES AND FISHING OPERATIONS:

The list of canoes recorded by the Fisheries Department indicates that there were about 8,000 canoes operating within the Kenyan waters between 1982 and 1985. The number, however, fluctuates over the years mainly because of the periodic fluctuations of fish catches and lack of capital to buy canoes. All the canoes are owned individually and since they vary in sizes the cost of a canoe ranges between Shs. 3,000 to 6,000 depending on the size. In essence, canoes are used for two main purposes, one (the major one) is for both fishing purposes and transporting of fish, second, is for transporting passengers.

In the olden days canoes were the only form of water transport within Lake Victoria, but as things developed ships and motor boats were introduced and took over, such that, at present canoes are not very popular passenger carriers. An ordinary size of canoe carries up to about 15 people. It is very unfortunate that even up to now, canoes are used to carry passengers across the lake, this is because most of the accidents that occur in the lake (put at 25 accidents) in 1985 by Police Headquarters) are

those involving canoes. For instance, during the survey only about 25% of the canoes interviewed had not been involved in any accident. Most of these canoes have leaks and are not sea or lake worthy. Therefore, very risky and unsafe for passenger transportation.

Just like the case of or engine boats, there have been many reports in our daily newspapers of canoes capsizing in the lake resulting to several deaths as in the case reported in the Nation Newspaper below which happened also due to overloading.

Lake tragedy: 3 bodies found

Three bodies had been recovered by yesterday following the boat mishap in which 15 footballers drowned in Lake victoria on Saturday.

Twenty-two footballers were crossing the lake in a canoe on their way to a match at Homa Hill Centre when winds broke the mast and upset the vessel. Of the 22, only seven were rescued.

According to Mr Alois Amoko Oudu, who is the Kanu chairman for Kanam "B" Sub-location, one body was recovered at 3 p.m. and the other two at 5 p.m.

Mr Oudu said that the first body was discovered in the Siaya waters and the others in south Nyanza waters about five km from the lakeshore.

He said that the survivors, who had been sleeping in the cold at the Homa Hills Centre, were scheduled to leave for Uyoma yesterday morning now that some bodies had been found.

According to tradition, survivors are not allowed to sleep in a house nor cross the lake back home until at least one body has been recovered. They will now sail across the lake back home but will not be allowed to lie in a house until all the other 12 bodies have been recovered.

Thirteen more boats have been mobilised to help the search for the remaining bodies. By yesterday at least 35 boats were involved in the search.

Meanwhile, the Nyanza Provincial Commissioner, Mr Simon Mung'alla, was to see the provincial Marine Police over the rule regarding the transportation of passengers across Lake Victoria.

"I am going to Kisumu right now to seek to know from the officers the conditions of the marine officers supposed to license boats and canoes." Mr Mung'alla said in an interview with the *Nation* at the centre.

Mr Mung'alla said the boat might have been overloaded, adding: "I don't think a small fishing boat can carry 22 people. That was endangering life. The organisers of the football team should have known this."

Mr Mung'alla said that the marine officers were to ensure that boat operators met certain conditions before licensing them. (NATION Correspondent and KNA)

SOURCE: Daily Nation 24th July, 1985.

Such canoe accidents are numerous within the lake but are never reported to the concern authorities except like the above one that draws the attension of the public and is reported in Newspaper. It is therefore, quite difficult to determine the number of accident occuring within the lake. Canoes are therefore only best when it comes to fishing and fish transportation ashore. Apart from being the best used for fishing, the number of people engaged in fishing using these canoes is quite big, mentioned earlier to Chapter II to be about 25,000 people with about 60,000 nets of various types in the lake. Fishing therefore offers employment to quite a good population of this lake region.

4.2.3.2 ROLE OF THE FISHERIES DEPARTMENT

The Ministry of Tourism and Wildlife has a Fisheries Department which handles all the fish and fishing matters. The Department has three Sections:-

a) Marketing and statistics - which deals with collection of data from landing beaches and marketing places.

b) Fish processing and Quality Control - dealing with the licencing of fish processing, checking of premises where

fish is processed and the handling of proccessing facilities.

c) Fish Farming Section - offers technical assistance to fish farmers.

The Department deals with the registration of all the boats in the lake, regulates nets sizes and fish thefts, the latter done by Fish Scouts who have 2 trawlers, I "sesse" Canoe and a speed boat. The regulations imposed include, regulating type of fishing nets, controlling fishing areas and fishing periods, and protecting fish breeding areas.

For the improvement of the fisherie's Welfare, the Fisheries Department introduced a Fisherman loan Scheme, but was stopped, in 1982 in Kisumu District due to the problem of loan recovery. Plans are underway to reestablish it.

4.2.3.3. MARKETING AND EARNINGS:

Most of the fish is consumed locally within the lake region, these are sold by local fish businessmen and women who after buying from fishermen, use either bicycles or public motor vehicles to transport their fish to the local markets within the area. With effect from 1984 a sizeable proportion of fish is filleted and processed for export to other towns and elsewhere.

A Nairobi based firm, Samaki Product Limited, in 1984, established a filleting and ice freezing plant at Kisumu's Industrial Area, from where they now process most of the fish exported from Kisumu in fillet form and packed in attractive cellophane bags. Samaki Products Limited has several refregerated vehicles (trucks) which move and collect fish from several major beaches around the Kenyan portion of Lake Victoria.

This firm is a real threat to the local fishmongers who hardly get enough for their business, however, a considerable amount is still smoked and sandried by these fishmongers, mostly women, for sale in other Kenyan towns. A typical daily catch for one canoe of Nile porch is averaged from the survey to be about 200 kilos which can sell at 70 cts to 1.70 per kilo depending on the market condition. The survey also revealed that the daily incomes ranges between K.Shs. 140/- to 350/- per day shared between a crew of 3 to 4 fisherman, which gives a monthly figure of between 1,050/- to 2,550/- per person for 30 fishing sorties. Despite these reasonable incomes the fishermen generally lead a very low standard of living. This is because most of the fishermen spend their money carelessly due to hopes of a similar catch and amount the next day.

The Fisheries Department is therefore, encouraging the fishermen to bank their money or invest them in more reasonable ways.

In an effort to improve the marketing and the general living standards of the fishermen, they have been encouraged to form fishermen¦s Cooperative Societies. The response has been very encouraging and as can be seen in map 7 there are currently 36 Fishermen's Cooperative Societies along the lake. 10% of the fish landings go to the Societies. This, plus other funds within the Societies is invested in other forms of business so as to maximize on profits for the benefit of the members. For instance, all the 21 Fishermen's Cooperative in Kisumu District had, by December 1984, a bank balance a totalling to 328,205.75 K.Shs. see table 17.

4.2.4. DHOWS:

These were the traditional water transporters on Lake Victoria. As seen in Plate 15 they are quite large vessels made of solid timbers and move using sails attached to a mast driven by wind. They used to provide transport for passengers and goods, especially cattle. However, these are now being phased out due to their slowness and also because its

MAP 7. LOCATION OF FISHING CO-OPERATIVES

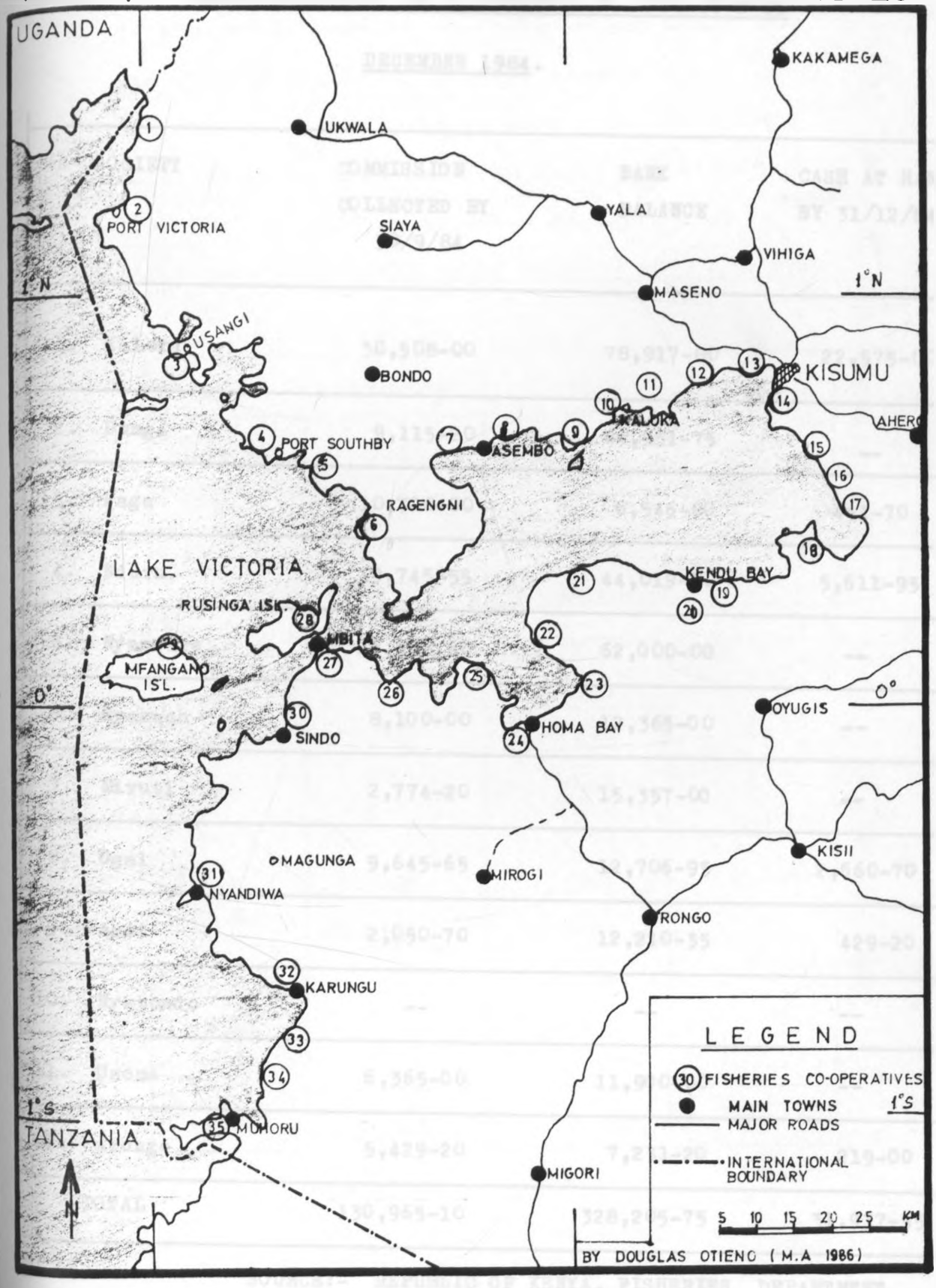


TABLE: 17 FINANCIALLSTATUS OF FISHERMEN'S CO-OPERATIVE BY DECEMBER 1984.

SOCIETY	COMMISSION COLLECTED BY 30/9/84	BANK BALANCE	CASH AT HAND BY 31/12/84
1. Kaloka	30,508-00	78,917-80	22,575-00
2. Dunga	9,115-20	64,951-75	--
3. Paga	10,700-00	6,546-00	441-70
4. Nduru	19,745-55	44,019-70	5,611-95
5. Nyamware	26,531.60	62,000-00	--
6. Nyakach	8,100-00	12,365-00	--
7. Miruti	2,774-20	15,357-00	--
8. Ogal	9,645-65	12,706-95	2,660-70
9. Asat	2,050-70	12,210-35	429-20
10. Nyabondo	--	--	--
11. Usoma	6,365-00	11,900-00	--
12. Arongo	5,429-20	7,231-20	219-00
TOTAL	130,965-10	328,205-75	31,937-55

SOURCE:- REPUBLIC OF KENYA, FISHERIES DEPARTMENT ANNUAL REPORT, 1984.

arrival at a given destination is totally determined by whether there is enough wind and whether the wind is going towards the desired direction. The records from the Kenya Railways shows a total of 90 dhows registered from 1959 to 1985 as is shown in table 18.

TABLE 18: REGISTERED DHOWS BETWEEN 1959 and 1985

YEAR	NUMBER	YEAR	NUMBER
1959	12	1973	-
1960	42	1974	-
1961	5	1975	-
1962	4	1976	-
1963	3	1977	-
1964	3	1978	7
1965	-	1979	3
1966	-	1980	6
1967	1	1981	-
1968	2	1982	-
1969	-	1983	-
1970	-	1984	-
1971	-	1985	-
1972	-	1986	2
TOTAL		TOTAL	90

Source K.R.

PLATE 13: A CANOE WITH FISHERMEN ON THE LAKE

PLATE 14: A DHOW AT HOMA BAY PORT (UNDER REPAIR)

The table shows that the majority of the dhows were mainly registered during the early 1960's (1959 - 1964) with a record registration in 1960 of 42 dhows. This was the time when dhows were the most famous means of transport on the lake. One problem resulting from the disappearance of dhows is that it was the only means of transporting livestock across the lake. Livestock these days are driven all around the lake shore or on major roads to markets, a task which is not only tiresome, but reduces, drastically, the quality of livestock taken to market.

4.2.5 MOTOR BOATS:

In the early period of the early 1960's there used to be a large motor boat operating between Kisumu - Homa Bay and Kendu Bay. Unfortunately, in 1965 it had a fatal accident in which nearly all its passengers were drowned. This seemed to have discouraged the would be investors in this kind of boat, because since then uptill very recently in 1985, no such a motor boat has operated in the lake. On further inquiry as to the absence of such motor boats for the long period, it was found that it is mainly because K.R. is authorized to control and dictate the operations of all motorized boats including licencing them. Because of fear of possible stiff competition from such motor boats,

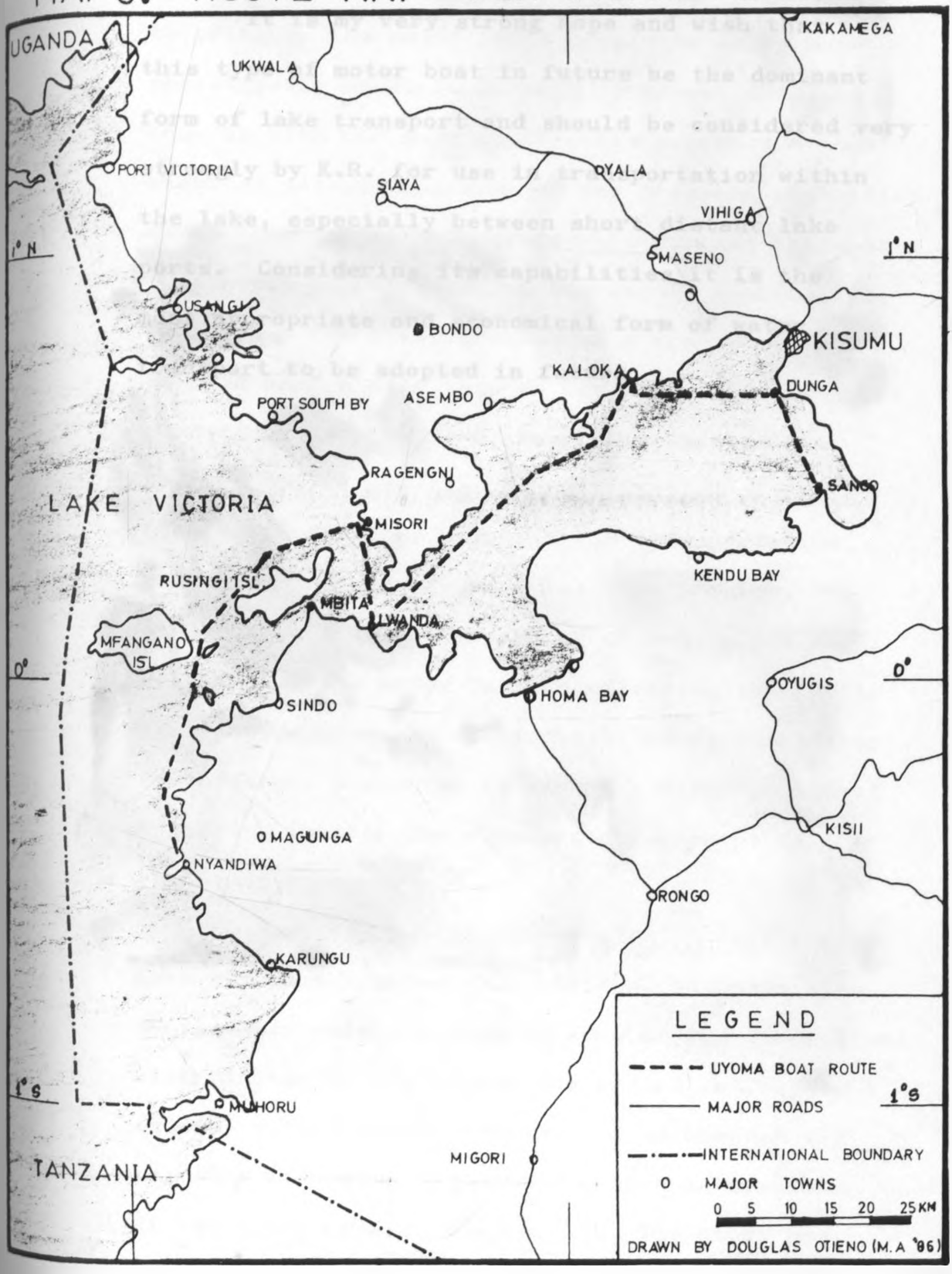
K.R. has ensured no such boats operate within the lake so as to maximize profits on what they get.

It was only after a long struggle that in 1985, August, a similar Motor boat to the wrecked one was licensed by K.R. to operate within the lake, but even after licensing it, it is not allowed to operate within the same routes as the K.R. ships which the owner of the boat actually wanted to operate on.
The motor boat seen in Plate 16 and named Uyoma Ferry MK 222S,is 45 feet long and 10.3 feet wide. It was licenced to operate between Lwanda Gembe (Nyamasare) - Misori - Nyandiwa - Dunga - Nyakach Sango and to Kaloka (see map 8) landing beaches with effect from 13th August 1985.

The boat is very fast being class 5c with Horse Power of 72 cc and a speed of upto 15 knots per hour, which is much faster that the K.R. ships. It is powered by an in-board engine, therefore more secure than the engine boats. Its carrying capacity is quite reasonable since it has a maximum capacity of 50 passengers plus 3 crews and carries cargo of upto 8 tonnes. This particular vessel is quite old and is estimated to have cost between 300,000/- to 500,000/- K.Shs. which is quite reasonable considering all its capabilities.

PLATE 15: UYOMA MOTOR BOAT

MAP 8. ROUTE MAP FOR UYOMA FERRY



The fares charged are also fair incomparison to the road transport costs.

It is my very strong hope and wish that this type of motor boat in future be the dominant form of lake transport and should be considered very strongly by K.R. for use in transportation within the lake, especially between short distant lake ports. Considering its capabilities it is the most appropriate and economical form of water transport to be adopted in future.

CHAPTER FIVE

5.0 THE STATE AND ROLE OF LAKE TRANSPORT

5.1 INTRODUCTION:

In this Chapter, an attempt has been made to bring up the major findings of the study more specifically so as to be able to digest them and come up with the most appropriate recommendations aimed at alleviating some of the problems identified as detrimental to the development of lake transport. This study as outlined in Chaprter I, Section 1.2, identified the study problem as a transportation problem and related this to the poor road transport condition, (stated more clearly in Chapter III Section 3.4.1) and the underutilization of the Lake Victoria water resource for transportation purposes. As a way of solving this problem, the study set out with the general objective of identifying the major factors affecting this water transport system and subsiquently to find solution to these and pland for it with the ultimate aim of fostering further the economic development of the study area.

The findings to be revealed in this Chapter have not been treated in isolation, but have been synthesised relating them to some of the theoratical observations in the literature review in Chapter I and the policy issues brought out in Chapter III together with some of the background information of the Study area in Chapter II. The study has come up with three broad major findings namely;

1) Advantages of the lake transport system,

2) the potential for the developmen of the water transport on the lake, and finally,

3) factors affecting the lake transport system.

These three broad findings have further been broken down to reveal other minor but equally important findings of the study under each of the three broad classifications of the findings.

It is important to note that this Chapter specifically deals with the findings and not the recommendations, which come up in the next chapter.

5.2 ADVANTAGES OF THE LAKE TRANSPORT SYSTEM:

As it has been mentioned before, it is accepted universally that a water transport system has the following advantages;

i) It has high and relatively cheap haulage

ii) Is suitable for handling of bulky goods

iii) it does not exercise any land at all (except for ports)

iv) Is relatively cheap

This particular study has examined these advantages, plus others, in comparison to the next important mode of transport in the study area, that is road transport, and has shown which features of this water transport system makes it more superior than road transport system along the lake. Among the advantages identified are;

a) Safety; The water transport was found to be viewed by the persons interviewed (100%) to be the safest mode of transport. This particularly refers to the ships operating on the lake. In terms of accidents the lake has recorded no ship accidents while the road accidents in Nyanza Province alone during 1984-1985 period is put at 1,521 people.[1] When it comes to loss of property and theft, the ship is very safe since there has been no incidences of loss of property or theft, while on roads, alot of property is either stollen or lost on transit due to carelessness of the drivers, thefts at stopovers, or damaged due to overloading. Goods on ships are insured while those transported by road are at the owners risk. The ships also have all the necessary life savings apparatus, mostly missing in motor vehicles.

b) Cheapness; This refers to the fares charged between similar points by ships and public motor vehicles. Table 15 shows that the fares charged by the water going vessels are much more cheaper than those charged by road transporters, and at times even twice more cheaper for instance between Homa-bay to Kisumu by bus is K.shs. 27, while by ship its only K.shs. 18/- shillings (see table 15 and Appendix 4).

c) Distance; The distance between the lake Ports Kisumu, Homa-bay, Kendu-Bay, Asembo-bay, Mbita and Karungu are much more shorter by water transport than by road. However, due to the slow speed of the ships, especially M.V. Kamongo) between certain ports like between Kisumu and Asembo-Bay, road transport ends up being much faster. (Road 45 minutes & ship 2 hours).

d) Comfort; Whereas travelling by road in this particular area is very tiresome due to the poor conditions of the roads as highlighted in Chapter III, and also because of the conditions of the vehicles, some of which are not road worthy, travelling by water is quite the opposite. The Kenya Railway ships are very comfortable. There is no disturbance at all in the water therefore facilitating a smooth running of the vessels. The ships have classes of sitting facilities i.e. in M.V. Rali II and III classes are available, M.V.Alestes I, II and III, and M.V. Kamongo II and III classes. Besides these, the ships have other facilities like bath and toilet facilities.

e) Capacity; In terms of both passenger and cargo transport, the lake going vessels have a much bigger capacity, than that of road vehicles. While the biggest bus carries

a maximum passenger capacity of upto 60 persons and .... tonnes in one trip, the capacities of the three operating ships as shown in table 9 is more than tripple that of buses. M.V. Reli has a passenger capacity of 136 and 20 tonnes of cargo, Reli carries 200 passengers and 20 tonnes of cargoand Kamongo 232 passengers and 7 tonnes of cargo in one trip.

f)Based on a cost benefit analysis done for the two modes of transport, water and road, the following were the findings;

i) The big water vessels (ships) are very costly to purchase costing upto over K.Shs. 10 million.

ii) The ships have a longer lifespan, averaged upto 40 years (M.V. Reli 39 years, Alestes 29 years and Homa 49 years old).

iii) Running costs, especially of fuel (diesel) for the ships was as follows; In one voyage Kamongo consumes diesel 1120 litres costing K.Shs. 6,104.00, Reli consumes in one voyage 1040 litres of diesel costing K.shs. 5,668.00 and Alestes consumes 875 litres of diesel per voyage costing K.Shs. 4,768.75. On average, therefore, one ship consumes K.Shs. 5,514.00 of diesel per voyage.

iv) Data on maintainance costs, expenditure on personnel and insurance costs were not available, however, the ware and tare on ships are very minimal except when there is a major repair.

v) Earnings per month per ship can be averaged to 89,501 K.Shs. (= 90,000/-) (computed from table 14)

From the above information the original outlay for a ship K.Shs. 10,000,000.

- Initial cost per year = 250,000/- (over 40 years)
- Running cost per year (5514 x 52)
  = 286,728/-
- Total cost per year = (250,000 + 2,867.28)
  = 536,728/-
- Earnings per year = (90,000 x 12)
  = 1,080,000/-

Therefore (net profit = (1080, - 536,728)
= K.Shs. 543,272 per year

For a bus the following were the findings;

i) Cost of a big bus is about 1 million K.Shs.

ii) The life span of a bus goes upto about 8 years (assuming it is very well maintained).

iii) Running costs of diesel alone per day is averaged to K.Shs. 600/- (on a very good day)

iv) Maintainance costs, insurance costs and expenditure on personnel not included.

v) Earning per day for one bus is averaged to 6,000/-.

Therefore;

- Initial cost per year for 8 years
  = 125,000/-
- Running cost per year = (600 x 364)
  = 218,400/-
- Total cost per year = (125,000 + 218,400)
  = 343,400/-
- Earnings per year = 6000 x 364
  = 2,184,000/-

Therefore Profit per year
= (2184000 - 343,400)
= K.Shs. 1,840,600/-
per year.

From the above calculations, the profit from buses is greater than that from ships, but as is mentioned later in this Chapter K.R. operates their ships merely as a service to the people, they are not outrightly operating for profit maximization. The above calculation however, are not very reliable since most of the figures used for calculation were got from interviews with the several owners of the two means of transport (K.R and bus owners) and besides this not all the running costs of the two have been considered.

When it comes to social costs as has already been mentioned, water transport offer the cheapest, safest, reliable and comfortable means of transport. When it comes to pollusion.

Motor vehicles pollute more the air than the ships spills a few drops of diesel in the water. On accidents, water transport is not as prone to accidents as road vehicles are. The objective of a transport system, as heighlighted in Chapter I, is to provide a reasonably cheap, safe, efficient and reliable means of transport. The study, therefore, based on all the above findings, found that the most favoured, efficient and reliable means of transport is water transport. It is my contension that though investment in water transport may look a rather expensive venture, it pays off in the long run and offers better service to the people. With better planning and organization, it can be much more economical and profitable than is currently the case in Lake Victoria. An investment in this line would be very much in order for the development of the lake and its surrounding, and to the investor.

5.2.1. Tourism: It was observed during the field survey that despite the fact that Lake Victoria is a special attraction being the second largest fresh water lake in the world, it has not been effectively utilized for tourism purposes. The Lake Victoria region has a lot of tourism attraction centres.

Among these were found to be, the Lamwe National Game Park, Homa Hot Springs, Lake Simbi Nyaima (a volcanic lake with alot of flamingoes), God Alur, Ndere Island, Rusinga Island Archaelogical site, Kit Mikai plus the rich cultural tastes of the traditional dance troupes such as the Kuria dancers, Luhya Sukuti dancers and Luo dancers, (observed mainly during Cultural Festivals). Within Kisumu Municipality also exists an Impala Park and there is a Bird Sanctuary near west Kano Rice Scheme.

All these, prove the fact that the area around the lake has alot of tourism potential that has not been utilized effectively. Being the cheapest form of transport and including all the other advantages water transport has over the other forms of transport, Water transport could be the best mode of transport to promote Tourism in this region. In addition to the above facts, it is the lake transport that forms the best link with the centres of attraction listed above. However, it is unfortunate as also observed by K'Odera C, (1982), that

> "the transport system currently being used on the lake has no tourism orientation, yet it could provide a cheap form of visting resource areas both to the southern and Northern Kodera part of the region" 2.

5.3 POTENTIAL OF THE WATER TRANSPORT

One of the Major Objectives of this study was to assess the demand for the water transport system. In Chapter IV, the various forms of transport

on the lake were found to be, K.R. Ships, Engine boats, sesse fishing canoes, Dhows and a motor boat. Having identified these, the study went further to establish whether there is enough demand for this mode of transport, by both passengers and goods, to warrant its further development. It emerged that there is enough demand for this water transport system, and this came up in light of the following outcomes.

Of those interviewed as indicated in Chapter IV, 93% preferred to travel by water than by road. This in actual sense implies that this mode offers better service to the people and is more convenient, subsequently, if well planned and organized, the water transport is assured of enough passengers over the years. Coupled with this is that, if the rate of population increase in the future on the south shore is assumed to be 3.7%, as is indicated by rate of population increase of Kisii and South Nyanza Districts in Chapter II, the population in this area in 1988 will be 25% greater than in 1982 and will have a 90% increase by the year 2000. On the assumption that the movement of passengers will increase in the same ratio as the population, a 25% and 90% augmenting of passenger capacity will be required in 1988 and 2000, respectively.

The overloading of engine boats and canoes is yet another evidence that there are already more people willing to travel between the short distance areas alongthe lake than there are vessels to transport them.

On the transportation of goods the current situation as depicted in Chapter IV is not bright enough to engage all the Wagon ferry ships, M.V. Uhuru and others, in the transportation of cargo across the lake. However, there is enough potential for the future development of this system of transport if some of the handicaps identified in Section 5.3 are rectified. As Meyer J.R. and Jean, V.P. (1971) contend, this study concurs with their view that transport and agricultural development are important inter-dependent factors in the development of rural areas.[3] In this area agriculture plays a very important role in its development. Chapter II indicates that the major agricultural farms at the inland point of the study area concentrates in Kisii, Awendo and Migori areas.

As proposed, if a railway line is laid from Homa Bay - Awendo - Migori with a branch to Rongo - Kisii and to Sotik, and a rail rampway installed at Homa-Bay, there is no doubt that all the agricultural commodities currently transported to Kisumu by road will find their way to Kisumu through the lake. Maize currently, is transported by trucks all the way by road around the lake to Kisumu. Similarly sugar produced at Sony farm and shipped out from Migori is carried by truck to Kisumu or directly to other markets, including Nairobi. This plus other cereals that used to come down to the lake are now carried by truck to Kisumu.

A lot of cotton is also grown within this area resulting to a good number of tonnes of cotton seeds that use the lake to reach Kisumu.

Livestock currently, is driven all along the lake to markets simply because there is no vessel that can be used to carry livestock across the lake to major markets.

Lastly, the lake has been seen to be very well endowed with fish which is currently being transported ashore by canoes and mainly transported to Kisumu by the Samaki Products Company that operates a fleet at refrigerated trucks that transport fish around the lake to Kisumu. Very little was found, goes through the lake to Kisumu by ships while there is alot of fish that could use the ships to Kisumu. Various other goods for commercial and personal purposes (Table 11) leave Kisumu to other Major lake ports amounting to K.R. Kisumu District Annual r/p. 1982 over 45,000 tonnes per year and also from other lake ports to Kisumu. With the lake towns expanding, their populations and requirements will increase requiring more capacity of the water transport vessels to transport these commodities to the desired areas along the lake.

What all this amounts to is simply that, there is enough demand to warrant the planning and developing of the lake Victoria water transport especially that operated by the Kenya Railways (since 84% of those registered during the survey as using water transport, use the Kenya Railways operated ships).

What remains and which is treated in the subsequent Chapter is simply to organize and plan for the development of this transport system. The M.V. Uhuru, currently idle for instance is capable of handling all the cargo transhipments, and the other three passenger ships; M.V. Reli, M.V. Alestes and M.V. Kamongo (with increased speed) are about enough to take care of passengers between the major lake parts, however, for expanded services one or two additional faster vessels are required. It is the view of this study that in the light of the above findings the development of this transport system will go along way in solving not only the transport problem within this area, but also contribute very effectively in the development of this region by providing; ease of access to resources, transporting products to market and delivering passengers to their desired destinations.

It was realized that for the development of this water transport into a more efficient and well developed transport system, alot of capital is required. For instance, the study on National Transport Plan done by the Japan International Cooperation Agency (JICA) in 1982 estimated the cost of a new passenger ship at 18.5 k.shs. million, the cost of installing a rail ramp and a rail car loading facility at Homa - Bay at 3.80 £ K.Shs. million and the cost of reinforcing the 9 lighters at 0.12 £ K.Shs. million. It therefore, means alot of funds is required inorder to develop this transport system into what is advocated for in this

study, This, however, should not be viewed as a drawback to the possibility of developing the water transport since the Kenya Railways Cooperation and other international agencies are already considering financing its development, and besides this, the government on recognision of the role and importance of this mode of transport in developing the lake region can always provide funds.

The Lake Basin Development Authority has also recognised the importance of the lake for transport purposes and has singled it out as an area worth developing.

5.2.1 POSSIBILITIES OF RESUMPTION OF STEAMER SERVICES BETWEEN KENYA, UGANDA AND TANZANIA

The collapse of the East Africa Community vary adversly affected the trade and cooperation that used to thrive between the three East African countries, Kenya, Tanzania and Uganda plus the neighbouring states like Rwanda, Burundu and Zaire. However, with the diplomatic relations with Tanzania and Uganda now restored, there is great potential and a bright future for the reviving of the international Lake Transport on Lake Victoria. It has been reported that major port facilities in Uganda were destroyed completely during political changes and fightings between rival political groups. For this, it will not be possible for Uganda to participate effectively immediately, but with time things will pick up to allow the operation of even

Tanzania on the other hand, has been embarking on the reinforcement of its port facilities with assistance from foreign donors, this is obviously designed for the transit of cargo from inland countries such as Sudan, Uganda and Rwanda. The main export commodities of Uganda, Coffee and tea, are primarily via Kenya and the reviving of Lake Victoria services would be a great relief to Uganda in saving on road transport costs.

As signs of this international Lake Transport success and potential for future development it was found that a Tanzanian Oil tanker ship M.V. Nyangumi, started operating from Tanzania on January, 1985, between Kisumu, Mwanza and Bukoba. However, its operation is irregular, based on no operation schedule. It operates according to the Tanzanian convenience when they feel they need oil. The tanker whose content is Premium, Regular, Kerosine, Gas Oil and heavy diesel, can come to Kisumu twice a week and loading usually takes two to three days depending on the products.

Another vessel owned by Tanzania M.V. Bukoba, also started an irregular operation from the 16th August 1985 from Tanzania. It takes about a week to be back in Kisumu, and operates between Kisumu - Musoma - Mwanza - Bukoba. The capacity of the ship is shown in table 19 below versus what it carried on two trips of 22nd August 1985 and 7th March 1986 between Mwanza Port and Kisumu Port and return journeys on the two dates.

TABLE 19: CARRYING CAPACITY OF M.V. BUKOBA VERSUS WHAT WAS ACTUALLY CARRIED ON 22/8/85 AND 7/3/86

CLASS	CARRYING CAPACITY (PASSENGERS)	NO ACTUALLY CARRIED ON 22/8/85		NO ACTUALLY CARRIED ON 7/3/86	
I	40	MZ to KS	17	MZ to KS	17
II		KS to MZ	17	KS to MZ	3
II	66	MZ to KS	5	MZ to KS	4
		KS to MZ	13	KS to MZ	5
III	344	MZ to KS	18	MZ to KS	13
		KS to MZ	11	KS to MZ	16
TOTAL	450				

Source: Field survey 1986 (Kenya Railways Records)

From table 19 one can deduce that what the ship carried on the two occassions is far much below its maximum carrying capacity both from and to Tanzania this was found to be simply because the operation has not been established on a regular basis but is done only when the Tanzania Government feels like it. With a well established route operating on a regular schedule more passengers will definitely use this transport.

Another move, identified, towards reviving the Lake Victoria transport between the three countries was a trial voyage in connection with the Northern Corridor

Organization (Tanzania, Kenya, Uganda, Rwanda, Burundi and Zaire) in which M.V. Uhuru run from Kisumu Port to Kemondo Bay in Tanzania on the 5th February, 1986, and M.V. Umoja (Tanzania) run on the 28th February 1986 from Kemondo Bay to Kisumu Port. This trial voyage for the resumption of M.V. Uhuru was an exercise purely and exclusively undertaken by the Managing Director at Kenya Railways Headquarters level. It was understood that the freight charges for the trailers and oil tankers had to be paid by the United Nations Development Programme (UNDP) who organized this voyage. On top of footing the freight charges, UNDP agreed also to re-imburse K.R. upto $1,000 for the expenses anticipated during the trial voyage.

The vessels M.V. Uhuru & M.V. Umoja, have no provisions for passengers, only the crew and cargo. They have a capacity of carrying 18 trailers and on the trial voyage they both carried 16 trailers with goods like oil, containers, clothing and wheat flour. This particular voyage should be viewed as a positive step towards enhancing Marine Services with our neighbours and it is to solve the problem of time wasted during transporting of goods from Kenya to say Rwanda by trucks which take quite a long time to reach and is very costly.

The UNDP has now to sit down with the two governments concerned so as to assess the feasibility of reviving this service, which is particularly important and necessary. For instance, loading of M.V. Uhuru takes one day and journey one

day and offloading another day making a total of about three days, while on land, trucks take about two weeks to deliver goods from Kenya to Rwanda, according to reports from Kenya Railways, Kisumu. These goods currently transported on land have survived only due to the interuption of the water transport of Lake Victoria since 1977 and also because the road transporters, as was mentioned in the transportation of Maize in Kenya around the lake, are sabbotaging the water transport operation.[3]

All in - all, the reviving of the water transport between the three countries stands a very good chance and has started on the right footing, however, it highly depends on the political stability of these countries and the understanding and trust they hold for each other.

5.4 FACTORS AFFECTING THE LAKE TRANSPORT SYSTEM

As just outlined the lake possesses alot of potential for the development of the lake transport and besides this, it has several advantages that make it a favourable mode of transport. Despite all this positive outlook, it has not been intensely exploited. What exists, as is described in Chapter IV, is but about half of what the lake is capable of providing in terms of transporting persons and goods. The transport problem mentioned earlier is partly attributed to this unexploited resource, and owing to this, it is very unfortunate that the people of this region are left with no better alternative, but to rely very heavily on road transport.

As seen earlier, 74% of those interviewed were found to be regular users of road transport, which as stated in Chapter IV and later in this Chapter, has quite a number of misgivings, most of which are attributes of the rough terrain of the Study area as is seen in Chapter II.

It was one of the objectives of this study to find out, in specifics what factors are behind the underutilization of the lake potential for transport purposes and even continue further to identify which factors are currently affecting the lake transport system in Lake Victoria, including the three main forms of water transport in the lake (ships, engine boats and canoes). After the revealations in Chapter IV, the study has identified the following factors as affecting the performance of the water transport;

5.4.1. Shortage of Vessels: It was found that Kenya Railways operates only three ships on a regular basis currently. These are few to make enough calls at each of the operating ports more than once a day. If the number was incrreased, ship would manage to visit each of the ports more than once, hence the people would be able to move to their desired places more frequently by water than is possible at the moment. Three ships in perfect mechanical conditions are lying idle at Kisumu Port due to lack of berthing facilities.

The study revealed that only 26% of those interviewed currently use the water transport regularily as opposed to the 93% who would use it if it were operating or visting each port several times a day.

5.4.2 Speed; As shown in table 9 the speeds of the three ships are quite low (M.V. Reli 9 knots/hour, M.V. Alestes 9 Knots/hr. and M.V. Kamongo 6 knots) Of all the ships only M.V. Uhuru, currently idle, has a relatively high speed of 13 knots/hour and is able to turn two trips per day between Kisumu and Homa Bay. The slowest of them all is M.V. Kamongo which manages to make only one trip per day and only one voyage per week between Kisumu - Mfangano and back to Kisumu.

5.4.3 Operation Schedule; (Appendix III); shows that none of the ports, Kisumu, Homa Bay, Kendu Bay, Kowuor, Mbita, Asembo Bay and Mfangano is visited by any one ship more than once a day towards a particular destination, i.e. only one ship leaves Kendu Bay to Kisumu in a day. This particular problem is not satisfactory to the customers who end up, against their wish, turning to road transport. The worst hit port is Mfangano Island, which has no other means of transport from and to the island

other than the ships. This particular islands people can only be transported to Kisumu once a week and only to arrive there at 5.30 p.m. (ref. Appendix II).

5.4.4. Restricted Service; Lake Victoria within Kenya, serves quite a portion of western Kenya, however, the ships which are the only dependable water transport form, serve only a few places namely Kisumu, Homa Bay, Kendu - Bay, Mbita, Kowuor, Asembo Bay and Mfangano Island. Services to Karungu Bay and Muhuru Bay were suspended due to lack of enough passengers since MV Kamongo could only visit these two ports once, and one could not make one journey to Kisumu in one day since the ship had to stable at Mfangano before proceeding to Kisumu. This greatly discouraged customers.

5.4.5 Costs: The current high cost of fuel oil makes ships transport, which is adapted for mass transport, much cheaper than that by railway or truck. In Lake Victoria, however, the distance by ship is relatively short and when shipping is included in the total, transhipment costs are involved twice, resulting in an actually higher overall transport cost [6]. For this reason Kenya Railways simply are operating the ships as a service to the people and not outrightly for profit miximization. This is viewed by me as resulting

to laxity, hence no serious efforts are made to improve the water transport services.

5.4.6 Terminal facilities; Only Kisumu port has all the complete necessary terminal facilities. The other ports, as revealed in Chapter IV, have barely enough facilities to handle serious passenger and cargo loading and offloading. Kendu Bay pier is in shallow waters and during dry seasons offloading becomes quite cumbersome. At Homa Bay port, which is the next in importance to Kisumu M.V. Uhuru can only reach it if a rail rampway is installed. For heavy cargo handling, which is foreseen in the future, loading and offloading equipment is required at Homa-Bay Kendu Bay, Kowuor and Mbita. These include cranes, stores, deeper harbours or longer jetties etc. It was observed that most lighters stay at Kisumu for more than 10 days waiting to discharge cargo due to shortage of labourers. This has distracted customers alot. Of the three cranes available at Kisumu Port only one was working, and for effective handling of good at Kisumu, the Port Forman observed that 4 good cranes are required plus two forklifts. The port also requires more artisans since only one major qualified Artisan is there currently. Several authors, one of them Barabara Ward, have pointed out that terminal facilities is one of the things

that make a transport system more effective. It therefore is obvious that, without proper development of these terminal facilities at the Lake port the Lake Victoria water transport system cannot be effective enough to compete with road transport.

5.4.7 Disorganization of Boats and Canoes; It was found that the overal problem affecting the operation of boats is that they are not organized at all, their operation is ad hoc, with only a few boats with particular areas of operation. The boats have no schedule of operation, they start their journeys only when they have got enough passengers, just like "Matatus". There is no overall umbrella organization to coordinate their operations and each boat is owned by an individual incharge of his own operations.

The study concurs with Luther Kusum's observation (in Chapter I) that boats thrive on more secondary routes which are shorter.

5.4.8 Size of Boats; The sizes of these boats is yet another handicap, since they can only carry upto about 15 persons per trip, hence their profit margins are restricted. Also due to this their small sizes, there is the tendency to overload so as to maximize

on profits, this has resulted in serious nasty accidents where people drown as a result of a boat capcizing. Records at Kenya Police Hqs show for instance, that in 1984, there were 9 lake accidents and 25 in 1985.

5.4.9 Canoes; were found to share the same problems with boats, however, their; are abit more complicated when fishing activities are brought in. Canoes, though the best when it comes to fishing, are abit too small for transporting alot of fish. Fishing net theft is also very rampant in the lake.

5.4.10 Life Saving Equipments; A major problem identified during the survey is that none of the boats and canoes have any sort of life saving equipment. In an event of an accident, the passengers are left helpless and drown in most accident cases. In conjunction with this, the marine regulations imposed by the Marine Police are not adhered to at all. These are regulations regarding overloading etc. The regulation in themselves are not comprehensive enough, for instance, there is no rule ensuring that each Boat has life saving equipments such as life bouys, life jackets and the like.

5.4.11 Government Policy; No specific government policy regarding the development of Lake Victoria transport system, in general, exists. The operation of ships is some how fortunate enough to be included in the Kenya Railways development Policies and plans, although K.R. gives more thrust to the railways, which is expected since it covers a wider area and is the main concern of Kenya Railways Corporation. The Government, on the other hand, has done practically nothing towards enhancing the development of the boats for transport purposes. Meyer, Kraft and Valette's (1971) opinion that "inefficient transportation policies may historicaly distort the optimal distribution of activities" and consequently "retard the development of otherwise well-endowed regions[7] is very much applicable in this particular case, because due to lack of any specific government policies regarding this water transport, there has not been any fundamental change in the development of this sytem of transport since its initiation.

The problem identified above as affecting the development of the Lake Victoria water transport in Kenya, are viewed as indicators of the underutilization of this very potential resource,

and it is only their solution that can lead to any significant positive steps towards making the water transport more efficient and a major contributor to the development of the lake region.

5.4.12 TOWARDS AN INTEGRATION OF WATER, ROAD AND RAILWAY TRANSPORT

William I Goodman, 1968 in an attempt to define transportation Planning has stated that "Modern Transport planning emphasizes the total transportation system, rather than one or more isolated facilities". He continues that..." it considers all modes of transport which are economically feasible to a state, region or urban area and considers all types of improvements"[8] Bruton, M.J. (1970) as stated in Chapter I, also discovered that "decisive relationships exist between all Modes of transport and that the future role of a particular mode cannot be determined without consideration of all other modes[9],

In agreement with the above observations, this study recognised the importance of an inegrated transport network and as one of its objectives it set out to examine how best the water transport can be integrated with the other modes of transport within the study area, namely,

road and railway. The study revealed that only Kisumu Port can be said to have any effective connections with the other mode of transport. The Nairobi-Kisumu railway line is directly connected to the port for effective handling of both passengers and goods. Passengers book directly from Nairobi to Homa Bay or Kendu Bay and on reaching Kisumu they are smoothly transferred to the ships en route to their destinations without any disturbances since they use just the same ticket used in the trains. Those coming in to Kisumu by water have the choice of bording a taxi or matatu that wait just outside the Port for passengers going their routes. All this means Kisumu Port has fairly appropriate terminal arrangements and links well with both the two modes of transport.

The picture however, changes when one reaches the other ports within the lake. Of course the other ports have no railway line connections.

When it comes to the integration of water and road transport all that exists in these ports is a single road that leads to the Pier. With the exception of Homa Bay, Kendu Bay and Mbita the other piers have no proper roads leading to the ports that can be used by vehicles to carry goods and passangers to and from the piers. Homa Bay, Kendu Bay & Mbita ports have fairly good

connections with the road networks in those three towns as is shown in plates 6, 7 and 8. But these are not used as should be, they merely provide access to these piers and nothing more than that. It is understandable that the towns concerned are fairly small urban settlements and the water transport has not been developed to a stage of having very advanced terminal facilities at these ports to facilitate an effective integration of three modes of transport.

Poor transport integration of all the three modes of transport was identified therefore, as another factor affecting the development of the water transport on Lake Victoria. It is, however, foreseen that if the volume of goods increase as projected, and passengers also increase as expressed in Section 5 of this Chapter, then there will, in the near future, be a more pressing need for better integration of these modes of transport. This will enhance the economic growth of this region and improve the transfer of passengers and goods at the terminals. The Lake Basin Development Authority (LBDA) a Statutory Organization established by an Act of Parliament in 1979, to undertake overall Planning, Coordination and the implementation of development projects in the Lake Victoria catchment area, has in

its forth development Plan stressed the need to develop the Lake Victoria transport, and indicates that the major thrust of the development must be directed towards establishment of effective piers and wharfs[10]. The development of the terminals therefore, is the key to the development of an integrated transport system within the study area.

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C H A P T E R S I X

6.0 RECOMMENDATIONS AND CONCLUSION

6.1 INTRODUCTION

In the light of the findings heighlighted in the preceding Chapters, this particular Chapter has been devoted entirely to the proposals. As indicated in Chapter I, the Objectives of this study in summary are;

i) to investigate the different types of lake transport operating on the lake and identify their various purposes and how they operate.

ii) To examine the potential of Lake Victoria as a public water transport resource.

iii) to examine the contribution of this mode of transport to the economic development of the lakeshore region.

iv) to examine how best the waterborne transport system can be integrated with both road and railway transport systems, and finally

v) to analyse and plan for the development

of this system of transport by identifying the problems affecting it and offering policy strategies and suggestions as to how it can be developed into a more efficient transport system.

The first objective has very exhausively been examined in Chapter IV, the second objective has similarly been dealt with in Chapter V, the third objective forms parts of Chapter IV and V, while the fourth, has been treated in both Chapter V Section 5.3.12 and this Chapter. It is therefore mainly the final objective that is the main thrust of this Chapter which is a problem solving Chapter. In view of this, an attempt therefore has been made to concentrate in giving proposals for the most crucial problems affecting the three most important forms of water transport in the lake, (ships, motor boats and canoes) pinpointing at what appropriate actions should be taken to improve and utilize this water resource so as to provide satisfactory services to the people and help promote the development of the area.

In formulating these proposals, it was found necessary to divide them into both short and term plans (5 years) and long term plans (10 years). In prioretising them this way, those projects that are very necessary in the development of this transport

system and do not require alot of finance have been ear-marked for implementation within the short term period, while those that are very financially involving have been categorised under the long term plan. In each case an attempt has been made to identify the Agency most fitting in the implementation of each proposal and, where data was available, the estimated cost of the project has been indicated as is shown in the summary table of the plans at the end of this Chapter.

It is my hope that these recommendations implemented will form an effective realistic plan for the development of this water transport system in the very near future.

6.2 SHORT TERM PROPOSALS:

The very first step that should be taken is that the Government should declare its recognition of this mode of transport and the role it can play in developing the lake region. This can only be achieved if the Government formulates specific policies regarding the inland water transport in Lake Victoria and incorporate this within its National development plans.

The policy framework should consider all the forms of water transport and provide guideline as to how they can be improved.

The most appropriate thing to do next would be for the Government to ensure that the Lake Basin Development Authority, which is responsible for the development of the lake region, put as a priority the development of the lake transport among its priority objectives, since currently the lake transport has not been given the concern it deserves in the recent five-year Development Plan of the LBDA. It is merely treated as another section ear-marked for development. Similarly, the Government should spell out the exact role of Kenya Railways in the development of this lake transport to ensure K.R. gives it more attension than is there currently. It has to be realized that the success of the lake transport will not only save funds used in constructing roads within the lake region, but lay the foundation for the development of the lake region which is the concern of the LBDA. Besides this it should be noted that the reduction of transport costs by mass transport is most preferable for the development of this region, and to accomplish this it is essential to take bulk and lot commodities back to the lake which offers relatively cheaper costs in terms of fares.

As spelt out in Chapter III Section 3.3.1, the role of the Ministry of Transport and Communication is to plan, design, implement and administer the development of projects for the various modes of transport. As the main arm of the Government dealing with transport matters, the study recommend that it intensified its role in improving this mode of transport by carrying out studies and implementing some of the proposals it has come up with that don't require much capital investment.

Within the policies to be included in the National development Plans, the Government should promote the utilization of the lake transport for tourism purposes. This can be done very effectively by the Ministry of Tourism and Wildlife in conjunction with the various local authorities within the study area. The lake Basin Development Authority will also play a significant role in this since as at now the LBDA has identified the tourim potential areas within the lake region, this would promote both domestic and international tourism which is currently being emphasised by the Government.

The Government through the Ministry of Transport and Communications, Ministry of Home Affairs (Kenya Marine Police), K.R. and the Fisheries Department, should ensure that the set out marine regulations are followed and on top of the existing regulations the study recommends that as part of the Marine

regulations the following rules should be imposed and strictly adhered to:-

i) No "sesse" canoe should be used for passenger transport within the lake. They should instead be used mainly for fishing purposes and for general light cargo and fish transporation, but only to short distances.

ii) No Motor boat or canoe should be given a licence to operate without a life saving equipment. Considering the costs involved, at least each boat or canoe should have between 3 to 4 lifebougs attached to it. These are relatively cheap and can even be made locally.

iii) Each and every ship operating within the lake should have at least one lifeboat. M.V. Alestes, for example, has no lifeboat.

iv) The ships should also be installed with emergency speeds which are not there in any of the ships on the lake currently.

v) Each water passenger carrying vessel including engine boats and even canoes (for cargo) should have a maximum passenger and cargo carrying capacity and lastly,

vi) The Marine Petrol and Fisheries Petrols in the lake should be intensified to ensure adherance to these regulations. This, however, calls for more speed boats (one or two) and more personnel.

All the above regulations are aimed at mainly reducing the rate of lake accidents in the lake which as is seen in table 19 is on the increase. These regulations will ensure safety of the water transport users.

TABLE 20: TOTAL ROAD AND LAKE ACCIDENTS IN NYANZA PROVINCE IN 1984 & 1985

ROAD ACCIDENTS	1984	1985
1. Fatal	458	241
2. Injury	131	167
3. Non Injury	371	153
TOTAL	960	561
LAKE ACCIDENTS		
1. Fatal	7	18
2. Injury	2	7
3. Non-Injury	-	-
TOTAL	9	15

Source: Kenya Police, Nyanza Province

For the improvement of the K.R. Ships operations, it is viewed that the fundamental policy in selecting priority projects for its development is how to effectively reinforce the capacity of the water transport so that customers may enjoy better service. In doing this, the most immediate step would be to ensure effective utilization of the existing facilities. For the three regularly operating vessels, all that is required is that their engine powers should be increased especially M.V. Kamongo's. This is considered under the short term period, since two engines have already been ordered for this purpose by K.R. With faster speed the ships would be able to visit the ports more frequently in a day. The tugboats S.S. Kavirondo and M.V. Homa Bay should within the immediate short term period be used just as they are with proper maintenance, however, within the later period they should be reinforced with more powerful engines.

In order to enable efficient passenger and cargo handling and in anticipation of the expected increase in the near future, the following Ports, Homa Bay, Kendu Bay, Mbita, Kowuor, Asembo Bay, Karungu and Port Victoria should be improved by improving the facilities at these terminals. But special attension should be given to Homa Bay and

Kendu Bay. What is needed at this initial period is just the provision of the primary facilities such as a waiting room or stand, stores, loading and offloading gear such as fork lifts and a small crane and the widening of roads at the terminals to provide ease of assess to the posts. (See map 9).

It is only after these terminal facilities have been developed that one can foresee a proper integration of the three modes of transport, road water and rail. The Government should outline in the policy how these modes of transport can be integrated with consultations with the relevant agencies given these responsibilities. The integration can only take place if the lake transport reflects a more dependable, reliable transport system, so as to attract the attension of the majority road users (74%) towards lake transport. The integration of the three modes of transport would go along way as promoting tourism in this area by using the lake transport as the main transportation mode supplemented by road network within the region. And With a direct link with Nairobi both by road and rail as the main gateway for tourists to Kenya.

To solve the disorganization of boats and canoes, and to improve their services and profits, it is proposed that the vessel owners,with the assistance

of the Government, form a unifying umbrella organization charged with the task of organizing and coordinating the operations of these vessels. This can take the form of a cooperative society, and with proper management the members can benefit by getting loans which can be used in purchasing of bigger and better motor boats. These can operate between smaller lake beaches not catered for by K.R. ships hence maximize on their profits since this is where their business is concentreated and can thrive better. Map 8shows the proposed routes for motor-boat operations. It is after this reorganisation that is envisaged that the engine boats can have a regular operation schedule and hence attract more customers. The study further recommends that K.R. should relax its restrictions concerning the licencing of motor boats, so as to give a chance to the aspiring motor boat operators.

These proposed short term plans are meant to be effective within a five year period beginning in 1987 to 1991. With these improvements effected, the lake transport will be more developed and this will set a foundation for the implementation of the proposals in the long term period recommended below.

6.3 LONG TERM PROPOSALS:

For the long term period, similarly more emphasis should be placed on the improvement of the existing facilities first before new additional improvements are brought in. First of all the two tugboats owned by K.R. and referred to under the short term plan, M.V. Homa and S.S. Kavirondo, should during this plan period be reinforced by increasing their speed. S.S. Kavirondo is particularly too old (bought in 1912) and the most appopriate thing would be to replace it with a smaller faster tugboat Since alot of money is required for its maintenance and it consumes a huge amount of fuel. M.V. Homa, currently used for towing cargo and for shallow ports, is still fairly operative enough, bought in 1937, and only requires increased speed by installing a new powerful engine. Alternatively, the two ships should be reconstructed as was done for Alestes and Reli to suit the present conditions.

Secondly, having noted in chapter V that alot of commodities, especially agricultural, may come down to the lake, then there ought to be sufficient capacity in the ships to handle this expected cargo volume increase. For this I see it only desirable that M.V. Uhuru,which is capable of handling

upto 540 tonnes full capacity per trip, be revived. This wagon ferry is particularly important between Homa Bay and Kisumu. With a maximum speed of 13 knots per hour, she is able to turn two trips per day between Kisumu and Homa Bay. The operation of M.V. Uhuru requires alot of cargo. However, the amount of 1984 production in the agricultural sector at Kisii and South Nyanza estimated as;

Sugar	60,000	-	80,000 tonnes
Cereals	50,000	-	60,000 tonnes
Others	5,000	-	10,000 tonnes
Total	115,000	-	150,000 tonnes

Warrants the revival of M.V. Uhuru if these tonnes could come down the lake. In connection with this, the Government should reinforce its earlier directive that maize be transported using water transport to Kisumu and not by road. This can be implemented during the short term period in readiness for reviving M.V. Uhuru during the long term period.

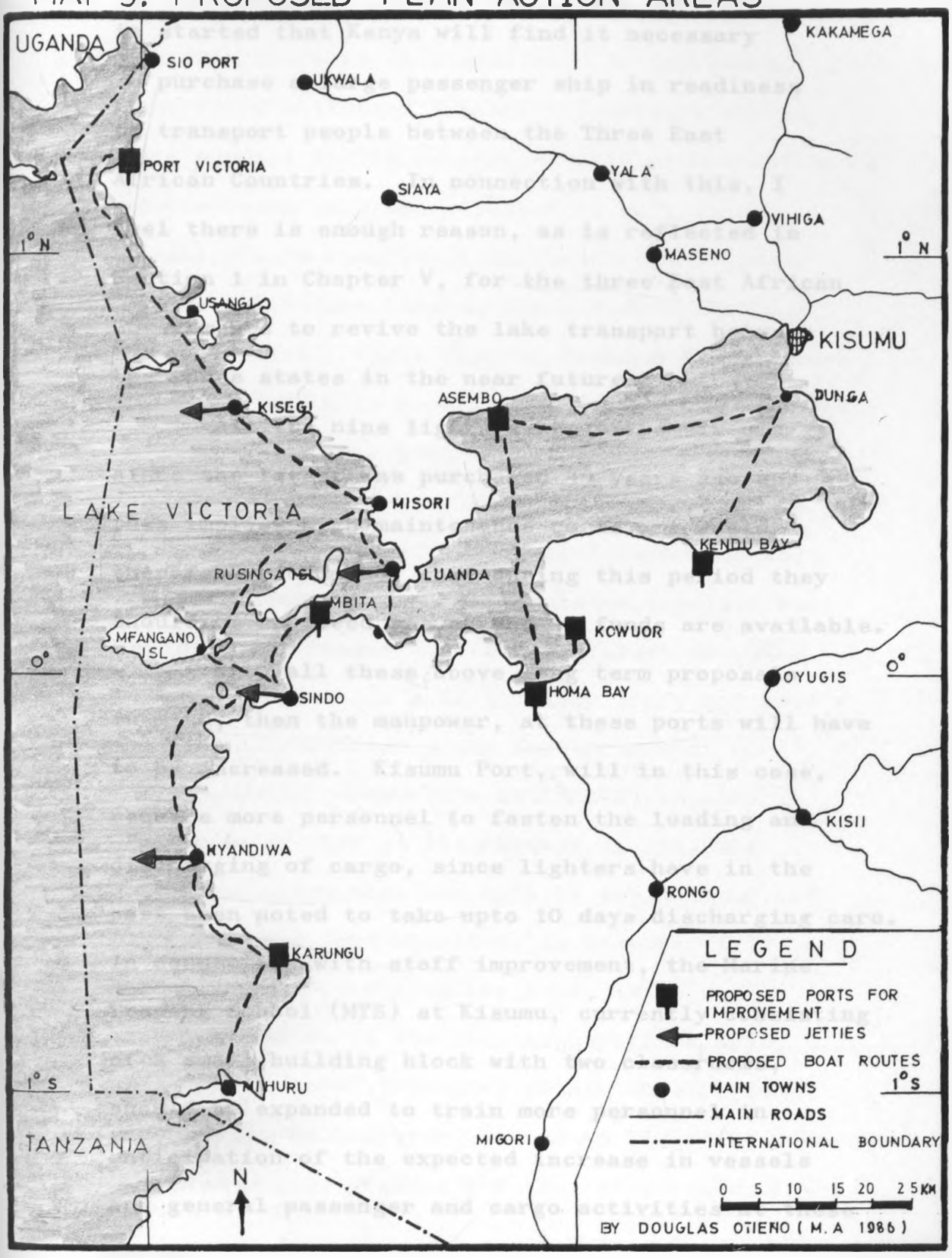
I further recommend that the proposed railway line from Kisii - Awendo to Homa Bay be given serious consideration by the Kenya Railway and be implemented during this period.

With this railway line realised, then I propose that a rail rampway and rail car loading

facility be installed at Homa - Bay, since M.V. Uhuru can only operate when this facility has been installed, and also because Homa - Bay provides the gateway for agricultural products from Kisii and South Nyanza Districts. With increased agricultural produce coming down the lake, the study proposes the development of jetties at the following beaches. Nyadhiwa, Sindo, Kisegi and Lwanda Kotieno. The first three beaches if developed will ensure ease of transportation of people and agricultural produce from the southern parts of the lake and warrant the revival of trips to Karunga Bay since the ships will on their day call at there ports to collect more people and goods. The last beach Lwanda Kotieno will provide a direct link and access to those wishing to cross the lake from both sides. With all this done then the trip to Muhuru Bay can then be revived and also Port Victoria.

For the operation between these new proposed ports and to enable K.R. to extend its services to a wider area, I recommend that to supplement the existing fleet of ships, the corporation should consider very seriously purchasing of between two to three large motor boats (not ships) which are comparatively cheaper and costs about two million shillings at the most.

MAP 9. PROPOSED PLAN ACTION AREAS



Is is only when the international water transport is started that Kenya will find it necessary to purchase a large passenger ship in readiness to transport people between the Three East African Countries. In nonnection with this, I feel there is enough reason, as is reflected in Section 1 in Chapter V, for the three East African Governments to revive the lake transport between the three states in the near future.

All the nine lighters are extremely old since the latest was purchased 49 years ago and this implies high maintenance costs. I would therefore recommend, that during this period they should be replaced one by one as funds are available.

With all these above long term proposals in mind, then the manpower, at these ports will have to be increased. Kisumu Port, will in this case, require more personnel to fasten the loading and discharging of cargo, since lighters have in the past been noted to take upto 10 days discharging caro. In connection with staff improvement, the Marine Trading School (MTS) at Kisumu, currently consisting of a small building block with two classrooms, should be expanded to train more personnel in anticipation of the expected increase in vessels and general passenger and cargo activities at these ports.

Lastly on lake transports I propose as has been the observation of the LBDA that; in Lake Victoria there is an urgent need to introduce controlled motorised fishing. The boats for this purpose should be equiped with either'out-board' or 'in-board' engines adjusted to suit local conditions to complement the traditional 'sesse' canoes which take long to reach and return from fishing zones. These fishing tawlers would ensure that fish which is a perishable commodity, reaches the consumers in a fresh condition. However, this should not be done to the detriment of the fishing canoes. For their sake I recommend that the Government should implement the proposed Boat-building and repair facilities project on Lake Victoria, for which a feasibility study had been done by a consultant group from Finnland, (FINN - CONSUL CONSULTING ENGINEERS) in 1984 sponsored by UNDP at the request of the LBDA. A similar study also was done by the Ministry of Transport and Communications in December 1979.

Moving away from the lake, it is very crucial that while the lake transport is being improved the road transport within this region should also be improved upon so as to strike a balance and create good grounds for the integration of the

two modes of transport. It is these roads that will feed the ports by creating access to the terminals. I therefore propose that the following roads should in the long run, be tarmaced, these are; 1) Karungu - Homa Bay road,

ii) Sindo, Mbita - Homa Bay road,

iii) Homa Bay - Kendu Bay - Sondu Road,

iv) Kisumu Bondo road, and

v) Oyugis - Kendu Bay road.

If all aan't be tarmaced then at least a few should be murramed and improved to all weather standards so as to be accessible during the rainy seasons. Besides these, other minor roads in between the lake region urban centres should be gravelled and where necessary additional ones constructed. (See map 10 for the proposed roads improvements).

As a summary to these recommendations, the major emphasis, as can be depicted from both the short and long term plans, is the utilization of the existing facilities rather than going in for new which are not only expensive but would take years before being actually implemented. This particular area of emphasis makes these proposals more realistic and therefore stands a good chance of being implemented.

PROBLEMS	PROPOSALS	AGENCY	ROLE	COSTS	PRORITY
Inadequate Govt. policy on victoria water transport	1. Provision of inland water transport policy guideline 2. Policy on utilization of Lake Transport for Tourism promotion.	1.Central Govt. 2. K.R. 3. LBDA 4.	Policy frame Implementation and planning	-	1
	1. Enforce marine regulations 2.mand force adherance	1. Central Govt. 2. Kenya Police 3. K.R. 4. Fisheris Dept.	Provide Legislation Enforce Complaince Provide regulations Reinforce Lake Patrol	-	1
Slow speed of vessels	1. Uhlisation of existing KR facilities - ships 2. Replace old engines	1. K.R.	Planning & Budgeting		3
Poor Terminal facilities	1. Improve existing ports/ piers 2. Provinde basic loading off loading facilities	1. K.R. 2. LBDA	Pier improvement	-	3

SHORT TERM PLANS CONTINUED

PROBLEMS	PROPOSALS	AGENCY	ROLE	COSTS	PRIORITY
Poor integration of the three modes of transport	1. provide policy guideline	1. Central Govt 2. K.R.	Integration Policy guide-implementation and integration	-	2
Organization of boats boats and canoes	1. Establish umbrella org-organization Coop. Societies 2. Buy larger motor boats	1.Central Govt. 2. Indivi-	Planning and provide loan facilities	-	2

TABLE 2.11(b) : PROPOSED LONG TERM DEVELOPMENT PLANS FOR LAKE VICTORIA TRANSPORT 9(1982 - 2002)

PROBLEMS	PROPOSALS	AGENCY	ROLE	COSTS	PRIORITY
Slow speed of Tug-boats	1. Replacement of S.S. Kavirondo	K.R.	Planning and Emplementation	Kshs. 2.4 million	3
	2. Replacing of old engines	K.R			
	3. Replacement of lighters	K.R			
Lack of wagon Ferry for transporting cargo from Homa-Bay.	1. Revival of MV. Uhuru 2. Implement directive to Use water for transporting maize	K.R Central Govt.	Implementation Policy framework		2
Poor Terminal facilities	1. Construction of Kisii -A Awendo - Homa-Bay railway line.	Central Govt. K.R.	Policy guidelines	Kshs. 76 million	1
	2. Installation of railway ramp and rail car loarding at Homa-bay	K.R.	Implementation and planning		
	3. Development of jethes at Nyandhiwa, Sindo, Kisegi and Lwanda Kotieno.	K.R.			
Lack of fast small tugboats And a passenger ship for international transport	1. Purchasing of motor boats	K.R.	Planning & Implementation policy guide li line	Kshs. 2 million	
	2. Purchase of a new passenger ship for international transport			18.5 million	3

LONG TERM PLANS CONTINUED

PROBLEMS	PROPOSALS	AGENCY	ROLE	COSTS	PRIORITY
Shortage of staff in marine section in future.	1. Increasing more staff	K.R.	Planning & Implementation	-	2
Uneconomical fishing methods	1. Introuction of motorised fishing boats	Fisheries Dept., Individuals	Planning, Legislation Formation of	-	4
Poor Road conditions	Improve road condition within the lake region	M.O.T.C. Local Authorities	Policy Implementation	-	3

To afford a better, faster understanding of the plans, a summary table has been compiled for each plan period showing the proposed actions and the general problems they are addressing. The agencies to be entrusted with the implementation of each proposal has been indicated plus the role it is most likely to play, and above all, on attempt has been made to cost the proposed actions or projects where data was available. Finally, an attempt has been made to prioritize the proposals showing which one should be given attension first and which ones follow in that order.

6.4 CONCLUSION:

As a summary of the whole study, the goal of this study as outlined in details in chapter one was to plan for the development and improvement of the lake transport so as to provide an efficient and a cheap mode of transport to the people, with the intension of improving the development of the study area.

The study objectives as detailed in chapter one are in brief:-

1) To examine the different firms of water transport in lake Victoria and problems affecting their operations.

2) To examine the potential of the lake as a public water transport service.

3) To establish the contribution of this mode of transport to its immediate hinterland.

4) To examine ways and means of integrating this mode of transport with the other modes within the study area, and

5) Finally, to analyse all the above and plan for the development of this lake transport system.

In pursuit of these objectives the study held certain assumptions upon which the study objectives were based. These as highlighted in Chapter I Section 1.4 are that;

1) the lake is currently underutilized as a potential resource.

2) the lake transport if well planned and developed can help allevial some of the transport problems experienced in this area especially on the roads transport.

3) the improved lake transport will promote the economic development of the lake region.

Having examined and analysed the outlined objectives of this study, the study concludes that the assumptions mentioned above hold. As a major finding it has emerged as outlined in Chapter IV and V, that the Lake has alot of potential and has alot of comparative advantages in comparison with the road transport, but despite this potential very little has been done to enhance its development. This includes both the Government and the owners of the different forms of vessels operating in the lake. This has resulted in the underutilization of this lake resources for transportation purpoes within the region.

As indicated in Chapter V, the lake transport is the cheapest mode of transport within the study area and offers a very convenient mode of transporting goods and passengers. It has emerged therefore, that the lake transport with proper planning and management and with support from the Government can alleviate the transport problems experienced in this region owing to the poor conditions of road transport (roads and services). The study has placed more emphasis on the restructuring of the operations of the various forms of water transport and calls for recognision and formulation of relevant and specific Government policies regarding this mode of transport.

However, in this endevour, more attension should be placed on the utilization of the existing facilities and inflastructure so as to avoid incurring high costs and for a more faster implementation of the proposed plans.

With the effective implementation of the proposed short and long term plans, the water transport which for the past period has played a more milder role in transportation of passengers and goods can play a very important part in the transportation of goods and persons in the light of the expected future population growth as indicated in Chapter I and V and also handle the expected increase in agricultural products to come down the lake for transportation to various markets and locations within and beyond, the study area. It therefore, as indicated in the third assumption of the study, will promote the economic development of the lake region.

6.5 AREA OF FURTHER RESEARCH

As defined in chapter one, the scope of this study covers only a small part of this wide subject on water transport on lake Victoria. Due to certain limits as time and finance some areas which are of equal importance as the one handled in this study and are of relevance to this study could not be covered.
It is therefore advicable that in future the following areas should be investigated since they provide potential interesting areas for further research. These are:-

1) Studies should be done on a more detailed way concerning the future potential of Lake Victoria in offering International Transport between the East African countries Kenya, Uganda and Tanzania, and how this can affect the other neighbouring states and consequently contribute, in terms of foreign exchange, financial gain to the Kenyan economy.

2) Studies should be done of how to improve the fishing boats and related facilities. This should consider the improvement of the traditional fishing "Sesse" canoes and even look into posibilities of starting a boat construction industry within the Lake region.

3) It would be of alot of interest to see the findings of a research on a similar study as this one on Lake Turkana, to see the possibilities of using the Lake for public transportation in the future as the population of that region increases.

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APPENDIX I

QUESTIONNAIRE I

Station ..... Date of Interview .....

1. Name of Respondent.....

2. Age;..... Sex .....

3. Place of Residence ..... Location ..... District.....

4. Major Ocupation .....

5(i) Do you own any other business? Yes..... No.....

(ii) If Yes specify .....

6. Ownership of vessel ..... (a) Individual
(b) Group
(c) Society
(d) Cooperative
(e) Any other Specify
.....

7. Type of Vessel .....

8. When purchased .....

9. Cost of the vessel .....

10 Major purpose of the vessel (a) Fishing
(b) Passenger Transit-
(c)GGoods Transport - Specify .....
(d) Any other .....

11 The capacity of the vessel (max) .....

12 Type of fuel (energy) used .....

13 Which is your Area (s) of Operation (General)

Origin .....Destination.....

14 How Regular is the operation? .....

15 Time taken from origin to Destination? .....

16 Number of Trips per day? .....

17 Profit accrued .....KShs. (a) Daily
(b) Weekly
(c) Monthly
(d) Annually

18 Fares charged per trip per person/Good .....

19 How is the competion from other vessels .....

Does it affet your business .....

20 Hoe does steamships owned by Kenya Railways Corporation

after youroperations? .....

21 Proble of accessibility in the lake if any .....

.....

22 Are there any marine regulations imposed on you ?

if Yes, which ones ? .....

23 Which Areas are restricted in the lake .....

..... and why ? .....

24 Which are the major problems affecting your operations .....

.....

25 How many people do you employ .....

26 Do you receive any assistance from any body (Government or private?)

..... No. .....

(ii) If Yes, What kind .....

27 How many accidents has your vessel been involved in .....

.....

28 What type of fuel doyou use ? .....

29 What in your opinion should be done to improve the water transprt

services in the lake ? .....

.....

30 How do you think this can be achieved? .....

31 Do you pay money to the Government .....

If yes, for what ? .....

32 How often do you leave passengers behind to avoid overloading?

.....

33 What are your plans for future expansion of your business .....

.....

34 How often is the vessel checked ? .....

QUESTIONNAIRE II .

Station ..... Date of Interview .....

1. Name of Respondent .....

2. Age ..... Sex .....

3. Area of Residence ..... Location .....

   District .....

4. Major Type of Occupation .....

5. (i) Do you have any Business requiring goods transportation?

   .....

   (ii) If so which business? ..... from .....

6. Which is your favourite mode of transport? .....

7. (i) Which mode of transport do you use more frequently ?.....

   (ii) Why? .....

8. How often do you use that mode?.....

9. (i) In your opinion which mode is best for marketing of goods in terms of transport? .....

   (ii) Why do you think so? .....

10 (i) Do you use lake transport? Yes ..... No.....

   (ii) If so which particular one do you prefer ?.....

   (iii) Why do you prefer this .....

   (iv) How fregent do you use it? .....

   (v) For what purpose do you use this mode? .....

   .....

   (iv) If for marketing or Transporting goods, where do you market the goods? .....

   (vii) Where do the goods came from? .....

   (viii) Are you satisfied with lake transport services?

   ..... No .....

   Give reasons .....

11 Which mode of transport is more prone to accidents in your own opinion ? .....

12 Which mode is more comfortable to travel in? .....

13 Which mode in your opinion is safest? .....

(a) Road (b) Water (c) Railway.

14 What is your opinion should be done to the lake transport services? .....

15 How best do you think this can be achieved? .....

16 In what ways can you consider the lake transport more superior than the other modes? (i) .....

(ii) .....

(iii) .....

17 How do you view the road transport system? .....

.....%

18 How do you view the railway transport system? .....

.....

19 What comments can you give concerning the water transport system?

APPENDIX II : DETAILS OF THE THREE OPERATIONAL K.R. SHIPS

M.V ALESTES	M.V RELI	M.V KAMONGO
1. Steel Construction	1. Steel Construction	1. Steel Construction
2. Twin Caterpillar Engine	2. Single S.C.Engine Caterpillar Diesel Engine	2. Twin Diesel Engine Goods
3. Passanger Carrier	3. Crew 25	3. Passenger camer
4. 22 Crew	4. Passenger Carrier	4. Crew 26
5. 200 passengers	5. Passengers 150	5. Passengers 232
6. 20 tons	6. tons 20	6. Tons
7 Cable length 40 Fothoms	7. Water buckets 4	7. Hand pumps 2
8. Navigation lights (one complete set)	8. Sand box 1	8. Sand boxes 2
9. Anchor 1	9. Anchirs 2	9. Anchors 2
10 Sand box 1	10 Oars 4	10 Oars 4
11 Water bucket 4	11 Bailer 1	11 Cable of shackles
12 Clock 1	12 Navigation lights (one electric set)	12 Navigation lights (one electric set)
	13 Clock 1	13 Water buckets 4
	14 SSP. Radio	14 Saund signal 1
		15 Bailer 1
LIFE SAVING EQUIPMENT	LIFE SAVING EQUIPMENT	LIFE SAVING EQUIPMENT
1. Fife Extinguishers 10	1. Sound signal	1. Fire Extinguisher 17
2. Fire buckets 4	2. Boat 1	2. ID Powder 19
3. Distress signals 5	3. Life Jackets 117	3. Life Jackets 258
4.	4. Life Rafts 2	4. Life bonys 14 (with self ingnition lights)
5. Life Jackets-232	5. Life bonys 6	5. Life rafts 5
6. No boats	6. Fire extingishers 5	6. Fire buckets 4
7. Life bouys - 11	7. Fire Buckets 6	7. Boat 1
8. Life rafts 6x22 passenger		8. Distress signal 1
		9. Life chutes 3

Source: Field Survey, 1986.

APPENDIX III

OPERATION SCHEDULE WITH THE EXISTING FLEST (1984-86)

1. "M.V. ALESTES"

KISUMU PIER - KENDU BAY - KOWUOR - HOMA BAY - ASEMBO BAY

SUNDAY	09.00	DEP.	KSP
TUESDAY AND FRIDAY:-	10.55	ARR.	KEN
	11.10	DEP.	KEN
	13.20	ARR.	KWR
	13.20	DEP.	KWR
	14.00	ARR.	HMA
	14.30	DEP.	HMA
	15.10	ARR.	KWR
	17.00	ARR	ASB - STABLE
MONDAY	08.00	DEP.	ASB
WEDNESDAY AND SATURDAY:-	09.50	ARR.	KWR
	10.10	DEP.	KWR
	10.40	ARR.	HMA
	11.10	DEP.	HMA
	11.50	ARR.	KWR
	12.00	DEP.	KWR
	14.00	ARR.	KEN
	14.45	DEP.	KEN
	16.00	ARR.	KSP - STABLE

ACCOMMODATION: 2ND CLASS AND 3RD CLASS

2. M.V. "RELI"

KISMU PIER - KENDU BAY - KOWUOR - HOMA BAY Z- ASEMBO BAY

MONDAY	09.00	DEP.	KSM
WEDNESDAYS AND	10.50	ARR.	KEN
	11.05	ARR.	KEN
SATURDAYS:-	13.15	DEP.	KWR
	13.55	ARR.	HMA
	14.25	DEP.	HMA
	15.05	ARR.	KWR
	15.15	DEP.	KWR
	17.00	ARR.	ASB - STABLE
TUESDAYS	08.00	DEP.	ASB
THURSDAYS	09.45	ARR.	KWR
AND	09.55	DEP.	KWR
SUNDAYS:-	10.35	ARR.	HMA
	11.05	DEP.	HMA
	11.45	ARR.	KWR
	11.55	DEP.	KWR
	13.55	ARR.	KEN
	14.10	DEP.	KENY
	16.00	ARR.	KSP - STABLE

FRIDAY:- NO SERVICE

ACCOMMODATION:- 1ST CLASS, 2ND CLASS AND 3RD CLASS

3. M.V. "KAMONGO" KISUMU PIER - KOWUOR - HOMA BAY - MBITA - MFANGANO

TUESDAYS	10.00	DEP.	KSP
AND	15.40	ARR.	KWR
THURSDAYS;-	15.55	DEP.	KWR
	17.05	ARR.	HMA - STABLE
WEDNESDAYS	07.00	DEP.	HMA
AND	10.30	ARR.	MBX
FRIDAYS	11.00	DEP.	MBX
	14.50	ARR.	MFO - STABLE
SATURDAYS:-	10.00	DEP.	MFO
	14.05	ARR.	MBX
	14.50	DEP.	MBX
	17.20	ARR.	HMA
	23.00	DEP.	HMA
SUNDAYS:-	05.30	ARR.	KSP - STABLE

MONDAYS:- NO SERVICE

ACCQMMODATION 11 CLASS AND 111 CLASS

4. TUGBOATS AND LIGHTERS - SERVICES (IRREGULAR) AS REQUESTED OR DICTATED BY AMOUNT OF CARGO.

APPENDIX IV

LAKE VICTORIA SERVICES - PASSENGER FARES

(KAVIRONDO GULF SERVICES)

	Kisumu pier	Kendu Bay	Kowuor	Homa Bay	Mbita	Mfangano
	Shs.ct	Shs.cts	Shs.cts	Shs.cts	Shs.cts	Shs.cts
Kisumu Pier	-	-	-	-	-	-
Kendu Bay	30.00	-	-	-	-	-
Kowuor	52.00	44.00	-	-	-	-
Homa Bay	52.00	36.00	14.00	-	-	-
Mbita	78.00	74.00	30.00	28.00	-	-
Mfangano	92.00	84.00	54.00	42.00	14.00	-
Asembo Bay	85.00	80.00	36.00	48.00	74.00	88.00

SECOND CLASS

	Kisumu pier	Kendu Bay	Kowuor	Homa Bay	Mbita	Mfangano
	Shs.cts	Shs.cts	Shs.cts	Shs.cts	Shs.cts	Shs.cts
Kisumu pier	-	-	-	-	-	-
Kendu Bay	22.00	-	-	-	-	-
Kowuor	38.00	32.00	-	-	-	-
Homa Bay	38.00	26.00	11.00	-	-	-
Mbita	56.00	52.00	23.00	21.00	-	-
Mfangano	65.00	59.00	39.00	30.00	11.00	-
Asembo Bay	62.00	58.00	26.00	35.00	54.00	64.00

THIRD CLASS

	Kisumu Pier	Kendu Bay	Kowuor	Homa Bay	Mbita	Mfangano
	Shs.cts	Shs.cts	Shs.cts	Shs.ct	Shs.cts	Shs.cts
Kisumu pier	-	-	-	-	-	-
Kendu Bay	12.00	-	-	-	-	-
Kowuor	18.00	17.00	-	-	-	-
Homa Bay	18.00	12.00	5.00	-	-	-
Mbita	28.00	25.00	14.00	10.00	-	-
Mfangano	33.00	30.00	19.00	17.00	5.00	-
Asembo Bay	25.00	23.00	11.00	14.00	22.00	25.00