

FACTORS AFFECTING GROWTH OF DESIGNATED
SERVICE CENTRES (A COMPARATIVE STUDY OF
MATUU AND KITHIMANI CENTRES)

BY

JAMES NGUGI KARIUKI
B.Sc. (URBAN-REGIONAL PLANNING) S.U.N.Y.

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS, IN
THE DEPARTMENT OF URBAN AND REGIONAL PLANNING,
FACULTY OF ARCHITECTURE, DESIGN AND DEVELOPMENT,
UNIVERSITY OF NAIROBI.

JUNE 1986.

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DECLARATION

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



JAMES NGUGI KARIUKI
(Candidate)

This thesis has been submitted for examination with my approval as a University lecturer.



KIAMBA
(Supervisor)

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

The completion of this work has been made possible through the cooperation and guidance of both individuals and institutions to whom I owe a lot of thanks.

I would like to thank first of all, the Department of Physical Planning in the Ministry of Works, Housing and Physical Planning for sponsoring me for the Master of Arts in Urban and Regional Planning.

Special thanks are expressed to Mr Kiamba, my supervisor, for his inspiring guidance and constructive criticisms throughout the work. To the other members of staff, students and friends, I appreciate their moral support.

I would also like to thank the Chairman of Urban and Regional Department, Mr Z Maleche who also assisted me greatly in the initial stages of this research work.

I am also indebted to my parents, brother and sister for their sacrifice during my college days and their patience while I undertook this study work.

Last and not least I thank Grace Mwangi for typing this manuscript. Her concern for the completion of the study gave additional inspiration. This thesis is dedicated to my mother, Mrs Joan W Kariuki from whom I learned the meaning of patience in undertakings that need special dedication and especially in the attainment of knowledge.

ABSTRACT

This study examines the factors that may have influenced the unprecedented fast growth of Matuu and inhibited the growth of Kithimani. At a higher level of designation, Kithimani is a rural centre whilst Matuu is a market centre and of a lower designation in the hierarchy of service centres. After an appraisal of some of the indices of growth that the physical planning department used in the designation of service centres, the study evaluates and analyses possible factors that have caused the anomaly which has hindered the growth of Kithimani on one hand and those that have propelled Matuu's growth on the other. These centres are about 17 miles apart and serve the same hinterland.

Kithimani's designation as a rural centre appears to have been influenced heavily by the fact that it was the divisional headquarters, and had a high concentration of infrastructural services for that reason, unlike Matuu. The study goes on to evaluate the historical, agricultural and transportation developments in the Yatta region as possible factors that have led to the present state of these centres in terms of physical social and economic functions.

The study confirms that transportation re-alignment of Thika-Garissa road caused an increased accessibility for Matuu and by-passed Kithimani inhibiting its reach adversely to other important centres in the region.

It therefore appears that when Kithimani was designated as a rural centre, little emphasis was given to its location relative to other vital centres in the region except for Machakos which is the district headquarters. It does not seem that the physical planners considered the locations and the influence of other important centres closeby like Nairobi, Thika, Machakos, Embu and Kitui

which had already been generating their own momentum of growth and their effects on Kithimani.

Results from the study also show that Matuu's central location and good accessibility to the mentioned complimenting centres has attracted the farmers in the highly productive agricultural schemes to market their produce in it and a condusive collection point for produce destined elsewhere in the region.

Lastly, increased traffic flow has been confirmed around Matuu mainly due to the re-alignment of Thika-Garissa road and improvements of Embu and Machakos roads. This flow of traffic generation rose insignificantly around Kithimani.

The above major findings have thus reduced the effectiveness of Kithimani as a rural service centre in Yatta area. Other minor findings of relevance to the study tells us that the historical development of centres are important indices of growth. Centres that have evolved as traditional market centres have better chances of growth and should be selected as service centres like Matuu whilst those that have evolved through administration reasons are not likely to gather momentum for self-generating growth like in Kithimani.

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CHAPTER 1

1.0 INTRODUCTION

This introductory chapter includes information which aims at indicating the importance and validity of the problem chosen thus, the reasons and justifications for the choice of the topic. Also included are the theoretical frameworks that have been applied in other regions of the world to tackle problems of similar nature. In the same chapter, clearly defined research problem is presented together with study objectives which indicate the scope and limitations of the study. Suitable assumptions in which to study the validity or nullness of the theoretical models are also out-lined.

1.1 STATEMENT OF THE PROBLEM

Kenya, like many developing countries faces many development problems which include how to promote an integrated regional development which aims at reducing regional inequalities and the stimulation of growth in the rural economy. As such, in the early 1970's, the government of Kenya laid a strategy for human settlements that was meant to reduce the regional economic disparities in the country. Findings from the Physical Planning department revealed that regional development problems arose due to the uncoordinated and irrational sitting of development relative to the needs of the people which resulted in a serious imbalance of the standard of services available within the districts and the lack of concentration of developments in centres. In an effort to alleviate the above problem, the government embarked in the designation of service and growth centre strategy where centres chosen were seen as poles where physical and socio-economic development would be activated into a self-sustaining development process.

This strategy heavily weighed on Walter Christaller's central place theory where centres were designated according to the amount and variety of infrastructural services it had. Thus, centres with a bigger concentration and variety of infrastructure scored high in the point system adapted qualifying them at higher levels in the hierarchy of service centres as opposed to those that had little concentration of the same. Four different levels in the hierarchy of service centres were Local, Market, Rural and Urban centres in an order of increasing importance according to their intended roles and functions and were directed towards reducing regional inequalities and stimulating rural development. It was also hoped that this undertaking would also curb the rural-urban migration which was overburdening the high cities especially Nairobi and Mombasa in the provision of basic services as housing, education, health and the general welfare services.

An evaluation of the validity of the theoretical framework used as well as its applicability in Kenya can be highly questioned because of the apparent short-falls in the intended functions and roles designed for each respective categories of the hierarchy in the designation of service centres. Sixteen years later (uptil 1986), some centres that were designated at a higher level in the hierarchy of service centres with their intended functional roles appear to have stagnated in growth whereas others designated at a lower functional roles seems to have gathered an unprecedented momentum in urban growth that was initially not predicatable. It was therefore, the intention of this study to identify factors that may have caused the apparent unrealisation of the goals set out in the government policy of service centres in Kenya.

A case study of two centres, namely, Kithimani and Matuu will be done in order to confirm or reject the applicability of the government policy mentioned above.

During the exercise of designating service centres, Kithimani which is the divisional headquarters for Yatta qualified as a Rural centre whilst Matuu on the other hand became the market centre of the region. However, over time, Kithimani appears to have stagnated in growth whilst Matuu has taken on a fast pace of urban growth taking expression in the high levels of physical and socio-economic developments.

The current settlements in these centres can be questioned logically with regards to the factors that governed their selection and placement in the hierachical networks of designated centres. Namely, the factors considered took into account the needs of the area, in terms of infrastructural requirments, examination of the 'then' existing infrastructure and transportation net-work, and needs arising from the development of local resources. According to results on a brief reconnaissance survey, the two following factors are meant to prove the success or failure of the government policy of service centres. The factors that will be analysed and evaluated will be concerned with the examination of the transportation networks and the development of agriculture in the Yatta furrow area.

The findings of the above factors will bear significance to the planning of centres. This will be seen in the ability of planners indicating areas within a region which are likely to to experience rapid urban growth and further help to determine the

requirements for orderly development of such centres.

1.2 THE OBJECTIVES OF THE STUDY

The major objectives of the study will be geared towards:-

1. Establishing the factors that have led to the fast and unforeseen growth of Matuu and the apparent stagnation of growth in Kithimani
2. Recommending possible remedial strategies that can help determine the requirements for orderly development of centres.

1.3 THE ASSUMPTIONS OF THE STUDY

The factors that are assumed to be responsible for the current state of urban development in these centres are:-

1. A weak road linkage system that seems to favour only Matuu and under-serves Kithimani
2. The agricultural development/s that have taken place since the designation of these centres.

1.4 SCOPE AND LIMITATIONS

The study will focus on the two factors mentioned above because of limitations in time required to undertake research and the tight budget allocated for fieldwork. In particular, the study consists of an analysis of the transportation networks in order to determine the accessibility of these centres to others in the region. The agricultural developments in this region (Yatta furrow region) and proximities of markets where agricultural produce is sold will also be evaluated to determine their importance in socio-economic development of centres.

The chapter out-line will be as follows:-

1. Chapter 1 deals with the statement of the problem, objectives of the study, assumptions, methodology and a brief literature review. Generally, this chapter is meant to guide the study into a manageable scope within certain limitations and can be called the planning chapter.
2. Chapter 2, is concerned with related issues of study at the district level.
3. Chapter 3, is the analysis chapter
4. Chapter 4, will focus on the findings, conclusions and recommendations of the study.

1.5 METHOD OF DATA COLLECTIONS

Basically, these were two sources of data collection used in this study. These were from secondary and primary sources of information.

1.5.1 SECONDARY DATA

This source of information included all documented materials that were used and of relevance to the study. Among others, they were District agricultural reports, Machakos district development plan, Human settlements in Kenya, and literature on the growth centre policy and concept from various authors.

The following government ministries were invaluable in giving information through informal interviews and written reports.

The Ministry of Agriculture gave vital information on agricultural development in the Yatta furrow area. Ministry of Transport and communications headquarters in Nairobi made available the historical traffic flow data for the Thika-Garissa road, A3⁵ and the transportation network systems in regional context.

Other vital sources of information came from Agricultural marketing agencies that buy agricultural produce from Yatta furrow area. They included Kenya Horticultural Exporters, Horticultural Crops Development Authority, West-Lands Exporter and Machakos Exporter just to mention a few.

The public utility companies were interviewed so as to give information to the levels of services they offer in each of the centres of study.

The Physical Planning department was an important source of vital information on how they approached the designation of service centre policy in terms of methodology and application.

1.5.2 PRIMARY DATA COLLECTION

A scheduled standardized questionnaire was used where the respondents were interviewed with the same questions, and where the respondents were free to give any response according to the available choices.

A 10% sample size of the population was taken to be a realistic representation of the farmers that were interviewed. In picking the respondent farmers, the Kth systematic random sampling was used whereby every 10th household from the the end was interviewed.

This questionnaire was meant to establish among the farmers their inequality through the evaluation of Physical and Socio-economic factors.

The method of content analysis and tabulations was applied in data analysis.

1.6 LITERATURE REVIEW

1.6.1 GROWTH CENTRE METHODOLOGY IN KENYA

The study of the hierarchical distribution of service centres and their respective service areas was based to an extent on Walter Christaller's central place theory. The basic principle of this theory states that a definite pattern and hierarchy exists in the spatial arrangement of service centres. This theory was considerably modified to suit local conditions, such as topography and variations in population density.

In the study, an inventory of the existing social and physical infrastructures of all centres in the province was first prepared. Data was collected for five categories of service and namely:-

- i) Administration
- ii) Social services, including Health and Education
- iii) Communications and Transportation
- iv) Trade and Commerce
- v) Industry and Power.

The services were divided to give 21 specific sub-categories, each of which was assigned points according to its relative importance with the major category; for example, 3 points were attributed to a hospital, 2 points for a health centre, and 1 point for a dispensary.

The number of points accumulated in each centre were tallied and it was assumed that the more points a centre scored, the greater was its centrality and the wider its sphere of influence. The maximum number of points was 51. Although 8 points was taken as the minimum necessary for a group of services to qualify as a centre, it was later found that for most of the drier parts of the country, not enough points could be accumulated to warrant a rational distribution of service centres even at the lowest level.

More than 170 concentrations of service centres were identified as either serving an area or having potential to do so. They were classified into four main groups, graded in descending order of hierarchical importance as Urban centre, Rural centre, Market centre and Local centre at the lowest level.

2* Urban centres are medium sized towns in the Kenya context which were designed to serve as the main commercial centres for an entire district. Generally, they were meant to contain the district administrative headquarters and would contain an estimated population in excess of 10,000 by the year 2,000 A.D.

Rural centres have been designated for development to provide at least 40,000 people in rural areas with administrative, social and commercial services. It was expected that with the progressive economic development of the rural areas, they would grow into small towns of between 2,000 and 5,000 by the year 2,000 A.D. The rural centres were particularly geared towards improving both the quality and quantity of services and

amenities in the rural areas. A concentration of administration and other services in these centres were planned and were meant to service them with public water supply, electricity and all weather roads.

Market centres were designated for development of lower level of services for a rural population of at least 15,000. The development plan suggested that the anticipated population of these centres was to be less than 1,000. It was intended that over time to concentrate health centres, chief's camp and secondary schools in these centres. They were to have plots designated for commercial uses as well as traditional produce market and it was planned to supply them with a public water supply and both banking and postal services.

Local centres were designed to serve a rural population of at least 50,000. Their resident population was planned not more than 200 and although they had no administrative function, it was planned that local centres would act as important trading and social centres especially in the sparsely populated areas of the country.

Although it was found necessary in the provision of such services to have a balance between what was economically feasible and the convenience of the rural population in terms of accessibility, the minimum number of people required to support a particular service function according to the type of service varies quite widely.

Since the notion of thresholds' is vital in the economic viability of a service.

3*Moseley, J M; points out that "it is difficult if not impossible given the dynamic nature of the situation, to prescribe minimum population thresholds needed to support certain services, but there have, of course, been numerous attempts to estimate these empirically" As a matter of fact, the optimum size of a rural planning unit is an interesting question because for example, the average rural commune in China is 50,000, in India, the smallest unit is around 80,000. In Kenya, the Development plan suggested that the rural centres serve around 40,000 people.

4*Whilst in certain areas in Kenya, a hierarchy of service centres exists which is meant to provide several levels of administrative, social, economic and commercial services, many of these centres have been allowed to grow up in some areas which can only operate on an uneconomic basis and which scatter, rather than concentrate the total services required. In other areas, services were so widely spaced that it was found necessary its plan for additional centres to meet economic and social needs. Another problem that arose was that in many cases, services of similar type were irrationally located in relation to the distribution of population that they became duplicated within a small- area thus incurring unnecessary costs and services themselves under utilized.

1.7 GROWTH POLE/CENTRE CONCEPT

In general, the terminology pertaining to the concept of growth pole/centres has been rather

confusing, various authors use, different terms combining the words 'Pole', 'Centre', 'Growth' and development in different ways to designate the same phenomenon. There have been suggestion to draw up distinction between growth pole and growth centres. 5*Niera Afra saw growth poles as economic or sectoral activities and growth centres as urban concentrations where these activities are localized. On the other hand 6*Kaklinski, A.A saw growth poles as nodes or areas of national significance in as much as their development affects not only the structure of regions in which they are located but also inter-regional correlations and the country as a whole and growth centres are basically inter-regional in character.

Just as it has happened with the attempt to draw up a distinction between the two concepts, no universal consensus has been reached in the definition of what growth pole/centres are. This has provoked authors like 7*Lausen, to refer to the concept as an idea in good currency due to its frequent use in regional analysis. 8*Hansen, concept composed of loosely related, vague sub-concepts, badly in need of a thorough semantic working, the concepts and the language which characterise it need more precise definition and more consistent usage.

The vagueness and ambiguity surrounding the definition of the concept imposes limitations and inhibits its application as a sound policy instrument. In 1969 9* Darwent, F., stated that unless the concept is defined more rigidly it may prove of little use for analytical explanatory or planning purposes. In order to avoid the consequent semantic confusion, it is imperative that the concept should be clearly

defined and its functions and role in bringing about the desired development outline.

In most literature, the concept is based on contemporary regional economic growth and location theories. The two approaches applies the concept either as used by 10*Perroux in abstract economic space, or to geographical space supplementing it with the central place theory. All approaches are however concerned as 11*Morgan, T.D. states with the question of how and where economic growth should take place in a region.

Perroux, 1955 12*, defined the concept of growth poles as field of forces consisting of centres, Poles or force from which centrifugal forces emanate and to which centripetal forces are attracted. Thus conceiving growth pole as an abstract economic space. 13*Boudeville, defined growth pole as a set of expanding industries located in an urban area and inducing further development of economic activity throughout its zone of influence.

14* Nichols, defined a growth pole as an urban centre of economic activity which can achieve self-sustaining growth to the point that growth is diffused outward into the pole region and eventually beyond into less developed region of the nation. The two concieve it as a geographical entity.

Thus, we have three inconsistent definitions of the concept of growth pole/centre, one emphasizing it as an abstract construct and the other as a real entity in geographical space.

All above definitions contain recurrent themes, related for example to urban status, size functional role, location and growth, but emphasis varies and few authors explain the relative importance of the characteristics. The implicit things in the definition and an essential departure in comprehension of the concept of growth pole is the conception of the process of development as polarized, that is involving a formation of clusters and/or peak of development.

In our study we have considered growth centres as nodes or geographical locations where economic activities are concentrated. It is in this node from which development impulses are expected to disseminate into the hinterland areas. The concept of the role of growth centres as vehicles for the dissemination of development impulses led to their adoption as one of the strategy aimed at achieving rural development in Kenya. Thus we find growth centres being areas geared towards imploring the quality and quantity of services and amenities for the rural area.

1.8 FRAMEWORK FOR TRANSPORTATION PLANNING

15* Like all planning, the policy goals and objectives and strategies of the plan must be well defined and understood to ensure that the plans can be implemented to satisfy the needs. Similarly, the structural and functional relationship between the policy making, the planning and implementation machineries should be adequate and sound enough to generate the

needs and means of the country. The only problem of applying this aspect of the transportation planning framework is that it is often not a practice to carry out a comprehensive transportation study and planning for the whole country and for all modes. Transportation study and planning is often done on a project basis and on local levels so that there are variations in the planning process and strategies unique to each situation/project.

16*Transport is a necessary concomitant of the exchange economy and is both cause and consequence of economic growth and development. The main purposes of the transport system is to facilitate the circulations of people and the movements of goods within and between human settlements.

In Kenya, the existing transportation system until recently has supported and reinforced the dualistic nature of the economy by having provided high levels of accessibility to a few major urban areas and selected rural areas, to the neglect of the majority of the population.

Road transport is currently the most important means of transport in Kenya and thus an important influence on human settlements in the future. As such an analysis will be done primarily concerned with the existing road networks in the study area. The significance of transport study and analysis will be in defining its important role in the achievement of some level of equitability in access between different areas, a more integrated and

necessary actions at various levels.

1. POLICY: Among others, the major transportation policy elements relevant to this study would be concerned with the matters of:-
 - a) Need satisfaction on adequacy of the system. The measures of which are:-
 - i) The fulfilment of accessibility for social and economic activities taking place in the area.
 - ii) The location and design of appropriate linkages between rural and urban areas and between the different modes.

2. OBJECTIVES: Such policies may be based on or translated into specific objectives. There are many possible objectives for transportation amongst which are the following:-
 - a) To facilitate movement of goods, persons and services.
 - b) To foster rapid and equitable economic development of the various regions of the country
 - c) To encourage and promote interstate trades, travel and tourism
 - d) To provide appropriate and adequate linkages between the different regions and settlements.

 - e) At the local urban level, to contribute to sound and orderly development of the city.

In order to fulfill these objectives, the right planning process and implementation strategies must be developed and adopted to the particular

balanced level of growth between urban and rural areas and the stimulation of agricultural production and income in general.

The importance of transport is ideal in the contrast between a village that has ready access to markets and one that is without an all-weather road connection or perhaps any road whatsoever. In the latter case there is little knowledge of the outside world, no scientific methods of agriculture, no cash coming into the village, no health facilities, veterinary services or adequate means of education. Crops are disposed of for what they can bring locally.

The village with a good road and some degree of dependable bus and truck service presents a very different picture. Seed, fertilizer and others inputs for intensive agriculture find their way into the settlement, cash crops are marketed regularly and consumer goods can be purchased at the market place. Children travel by bus to school, the agricultural extension worker and the veterinarian can reach the settlement and transport costs by truck are sharply below the cost of moving goods by human and animal power.

1.8.1 TRANSPORTATION AND LAND-USE

Different types of land-use provide the basis of measuring the social and economic activities and characteristics being generated in an area. It is these social and economic activities and characteristics which ultimately produce demand for transport or

generate the various traffic. Conversely, accessibility through transport development and adequacy promotes the growth of large scale social and economic activities in an area.

1.8.2 THE SOCIAL AND ECONOMIC FACTORS

These are the real factors of demand and land-use based. The type of social and economic activities generating traffic vary from area to area and in the context of rural and urban situation. However, for the relevance to this study which is rural base, I shall focus on rural context situation.

1.8.3 IN RURAL AREAS

The land-use activities generating traffic in rural areas or in the regional context are mainly agricultural, mining and commerce. Therefore planning informations are required on the population, acres of productive or potential productive land, the carrying capacity of land, quantities of market agricultural products such as grains, livestock, timber etc in the area.

Since these rural products are defined for consumption or processing in the urban areas or in other regions, the information yield data for transport demand, rural feeder roads and regional or national trunk roads are important.

In addition, the distribution and pattern of human settlements as a measure of land-use intensity determines the network location and

connectivity/linkage as the nuclear settled areas would least favour maximum use of the transit through transportation system. Hence the interaction between land-use and transportation system is a fundamental factor in the generation and distribution of traffic.

1.8.4 ROAD NETWORKS IN KENYA

The present road networks in Kenya has been classified into a five level hierarchy ranging from International Trunk Roads A to minor roads E. Apart from these, there also exists Special Purpose Roads like tourists, tea, sugar, settlement and rural access roads. Furthermore the road networks contains an unclassified system of tracks and other semi-motorable routes.

CLASSIFICATION

- A - International Trunk Roads
- B - National Trunk Roads
- C - Primary Roads
- D - Secondary Roads
- E - Minor Roads.

Generally speaking, the higher categories of roads (A, B, C), constitute the Arterial system of Kenya. These represent the (inter) national and inter-regional network of which the chief function is to provide through corridors and to link different regions and

centres of national and regional importance over the whole country. On the other hand the D and E routes form the access system representing the regional and local roads, of which the chief function is to provide both a circulation and distribution function.

1.8.5 MEASUREMENTS OF ACCESSIBILITY

17* Inaccessibility of rural residents take from their being physically or spatially separated from the 'thing' desired. Hagerstrand* puts it this way "one is legal/social. Frequently an individual must fulfill certain requirements in terms of training, age, ability to pay, support from others and so on in order to pass the barrier around the supply point he wants to reach. The other is physical. He must be able to command the transportation facilities which are needed for him to reach the supply points at suitable times.

Measures of accessibility then incorporate two elements; 'the units of separation' between the person or place in question and his destination and a 'measure of the utility of the various destinations'. A measurement tool which can be used for evaluating alternative transport and locational policies as useful to derive 'comparative' measures of are accessibility (with trade-off units of separation against the number of destinations which become accessible) as the use of composite measures which combine the two factors into a single index.

1.8.5 COMPOSITE MEASURE

18* The most well known kind of composite accessibility measure which will be used in this study is the index of 'Population Potential', based upon the gravity Model. In this model a centre's accessibility is a function of it's proximity (measured in time, quality or classification of Road system, distance or generalized cost for example to alternative destinations of varying utility.

A simple approach that will be used in this study will be to categorize our spatial units centres in terms of the functional importance thus quality of the links they enjoy to specified destinations as has been indicated above in road classifications.

1.9 AGRICULTURE AND LAND POTENTIAL

19* Kenya's most valuable asset is land. With the overwhelming proportion of the people of Kenya still living in the rural areas and earning their livelihood predominantly from agriculture, land must be seen as a central resource, which the bulk of the rural households must control, now and in the future, if the generation of their basic subsistence and cash income is not to be jeopardized.

20* Not surprisingly, the agricultural sector is at present by far the most important part of the economy of Kenya. Not only does 85% of the population depend on agricultural

production for its livelihood but about 50% of the export earnings are coming from agricultural products.

21*About 73% of the total Kenyan population lives on small holdings. It is also within this sector where most of Kenya's working poor' are to be found. These rural poor account for about 45% of the small holders. The often difficult position of large numbers of small holders was recognized by the Kenyan government in her fourth National Development Plan (1979/1983).

Thus, its major objectives were: poverty alleviation, agricultural growth, improvement of the balance of payments, employment and conservation of natural resources. Under these objectives, the plan focused on small-scale agriculture and on the arid and semi-arid areas where farms were to be given every opportunity in the monetary economy.

Since the majority of people in Eastern province derive their livelihood directly from land and any cash incomes related to the development of agriculture, farming is and will continue to be the basis of urban development in this region. The large proportion shown as agricultural land reveals that up to 80% of the agricultural land is unsuitable for any form of cultivation and is largely semi-desert or at best marginal stock-raising land, 21*Only 3.6% of the total area of the province receives

more than 35" annual rainfall this being considered as land of high potential which can be used for crop farming. 23* Most of Machakos district is of medium potential in the Agricultural land-use potential classification, (fig) and contributes only 4.4% share of the total agricultural potential in the country against other districts with contributions as high as 7.0% as in Meru District and others with contributions of 0.2% as in Wajir District.

However, if an improved classification of agricultural systems is to be really useful, it should shed light on important practical or theoretical questions. When we consider the agricultural efforts of an entire nation in the under-developed world, our attention focuses on its chances for survival and prosperity. Accordingly 24* the new agricultural classifications emphasize per capital productivity and how productivity is changing through time. Two types of limits prevent a society at a place and time from increasing its maximum output per person. The first limit is the technological know-how that a society is able and willing to use the other limit is the resource endowment per person. is a ratio indicating population pressure on the base of available resources.

Various mixtures of agricultural activities for a variety of situation; (locational); site; (physical) and behavioural, (cultural) reasons. For one thing, farmers differ in the amount of risk they are willing to accept.

This is partly because farmers differ in their awareness of marketing. Possibilities and others although they know fail to act according to their knowledge. It is well accepted that market information diffuses away from the high urban centres at different rates according to road density, and it diffuses away from the roads at much lower rates at the micro-regional level. As agricultural outputs move from farm to Market, they encounter many of the same obstacles to movement that people and ideas encounter. Cultural variations among people make ideas more rapidly through some populations and slowly, if at all through others. Thus, the reasons for mixtures of agricultural activities within the transition zones are the same as the reasons for geographical variations at the macro level 25*. The three reasons are: differences in relative locations in a communications space; (2) site differences; and (3) variations in human behaviour habits.

1.9.1 HOW RELATIVE LOCATION CAN INFLUENCE THE USE OF RURAL LAND

Here, we must begin by imagining a hypothetical isolated homogeneous agricultural region consisting of a market town surrounded by a farming region. All farm outputs are sold in the single market-town and all the farmers non-agricultural wants and needs are supplied by the centre. These assumptions are based on those of the famous model devised in 1803 by a German economist and land owner;

Johann Heinrich Von Thünen. The question it tries to answer is what will be the production pattern and related land-uses around the Centre?.

This model confirms that the farther the farm is from the market, the larger is the portion of gross profit that is earned up in movement costs or in transport costs per hectare per year.

When farmers compare the profitable alternatives at their locations, then they select the most profitable alternative.

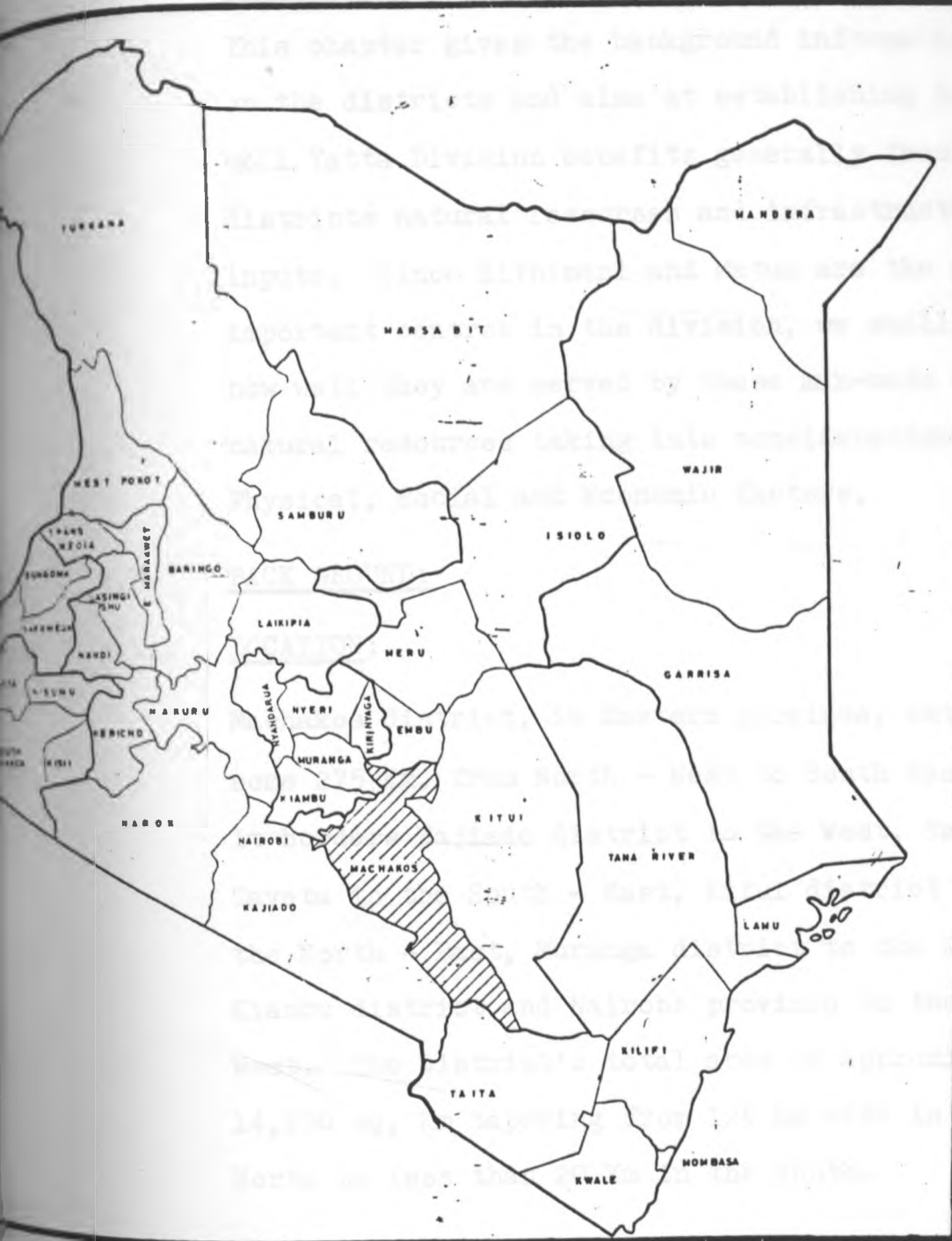
In our simple model, the profitability of each activity at each location depends only on gross profit levels distance and transport rates, and in this way location influences land-use. Once we assume that a farm is located at a place, its activities depend on its location or distance from the market and the cost of overcoming distance. The rational, ideal, profit maximization pattern of land-uses yields a spatial pattern of concentric land-use rings beyond which a certain distance limit, land-use is unused.

As such, for our two comparative centres of study we shall proceed to evaluate how their functional roles influence the agricultural land-use patterns and which centres have an advantage in terms of marketing advantages according to relative accessibility levels, thus higher profit margins. Thus a centre closest to an agricultural production and due to its easy accessibility as a market will obviously benefit economically than one

that is far away from agricultural cultivation
due to high transport cost to the market
centre.

1-33

Map No I



MACHAKOS DISTRICT
NATIONAL CONTEXT

NAME: KARIUKI J. N.
CANDIDATE: N.A. PLANNING
DEPARTMENT: URBAN - REGIONAL PLANNING
DATE: JUNE 1988



2. MACHAKOS DISTRICT BACKGROUND

2.0 INTRODUCTION:

This chapter gives the background information on the districts and aims at establishing how well Yatta Division benefits generally from the districts natural resources and infrastructural inputs. Since Kithimani and Matuu are the most important centres in the division, we shall see how well they are served by these man-made and natural resources taking into consideration Physical, Social and Economic factors.

2.1 BACK GROUND:

2.1.1 LOCATION:

Machakos district, in Eastern province, extends some 275 Km. from North - West to South East. It borders Kajiado district to the West, Taita-Taveta to the South - East, Kitui district to the North - East, Muranga district to the North Kiambu district and Nairobi province to the North West. The district's total area is appromixately 14,250 sq. Km tapering from 125 Km wide in the North to less than 20 Km in the South.

2.1.2 ADMINISTRATION:

The district is divided into eight administrative divisions and thirty four locations of which four are in Yatta division. There are four local

authorities which includes Masaku County Council which does the planning and managing of smaller centres in the district. Therefore Kithimani and Matuu centres falls under the Masaku County Council's responsibilities. Other local authorities are Machakos Municipal Council which manages and serves Machakos town which is the biggest urban Centre in the district and had a population of 27,364 persons according to the 1979 population projections. It is also the district headquarters. Athi/Tala and Kangundo urban Councils are charged with the responsibility of managing and serving Athi river and Tala and Kangundo urban areas. Athi river had a population projection of 9,760 in 1979 whilst Kangundo's 5,709.

2.2 PHYSICAL DESCRIPTION

2.2.1 TOPOGRAPHY.

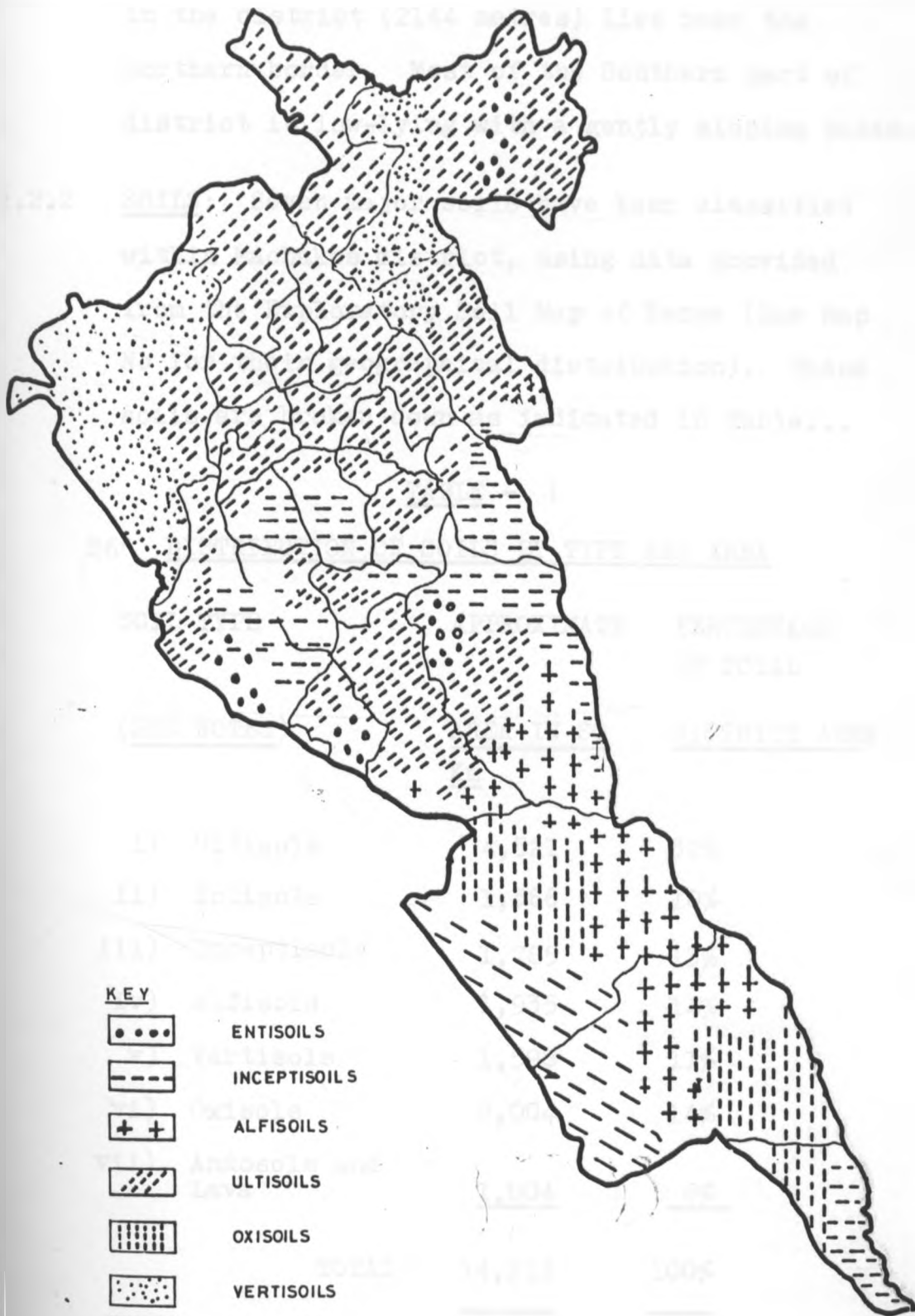
In general terms, the land rises from slightly below 600 m above sea level at Tsavo in the Southern end of the district, to 1,100 metres in Yatta Division and 1,600 metres in the north - , West end at the outskirts of Nairobi. Between the Athi-Kapiti plains in the North - East lie a number of hill masses, notably the Mua, Iveti and Kangundo massifs of basement/complex rocks. The granitic Mbooni and Kilungu hills to the South of Machakos town rises to 1,900 m. These hills are also notable at ~~Ma~~mani, where they rise

MACHAKS DISTRICT

MAJOR SOIL TYPES

NAME	KARIUKI J. N.
CANDIDATE	M.A. PLANNING
DEPARTMENT	URBAN - REGIONAL PLANNING
DATE	JUNE 1986

Map No 2



KEY



ENTISOILS



INCEPTISOILS



ALFISOILS



ULTISOILS



OXISOILS



VERTISOILS



ANDOSOILS



to 1800 m. The volcanic chulu hills in Kibwezi Division lie along the South - Western border of the district, while the volcanic remnant of Ol Donyo Sabuk hill, which is the highest point in the district (2144 metres) lies near the northern border. Most of the Southern part of district is low-lying with a gently sloping plain.

2.2.2 SOILS: Seven major soils have been classified within Machakos district, using data provided from the Exploratory Soil Map of Kenya (See Map No for their geographical distribution). These soils are broken down as indicated in Table...

TABLE - 1

26* DISTRIBUTION OF SOILS BY TYPE AND AREA

SOIL TYPE	APPROXIMATE	PERCENTAGE
(<u>SEE NOTES</u>)	<u>AREA IN SQ</u>	<u>DISTRICT AREA</u>
	<u>Km</u>	
i) Ultisols	4,521	32%
ii) Entisols	1,366	10%
iii) Inceptisols	1,785	13%
iv) Alfisols	1,935	14%
v) Vertisols	1,598	11%
vi) Oxisols	2,004	14%
vii) Andosols and Lava	<u>1,004</u>	<u>6%</u>
TOTAL	<u>14,213</u>	<u>100%</u>

* NOTES:

- (i) Ultisols - These are deeply weathered soils, enriched with clay often highly coloured by iron oxide occurring mainly on hill masses described earlier, particularly in the densely populated, high potential agricultural land.
- (ii) Entisols - generally developed from recent sediments and often thin and coarse textured.
- (iii) Inceptisols - young soils without clay enrichment with minimal weathering.
- (iv) Alfisols - more weathered than Entisols and Inceptisols and showing some clay enrichment (Cotton Soils).
- (v) Vertisols - have more than 30% clay, especially rich in swelling clays, characterised by deep cracks when dry and are high in nutrients (Black Cotton Soils).
- (vi) Oxisols - are generally intensively leached of all unweatherable residues and the most stable weathering products.
- (vii) Andosols and Lava - developed on volcanic ash, slightly weathered lavas and are extremely permeable.

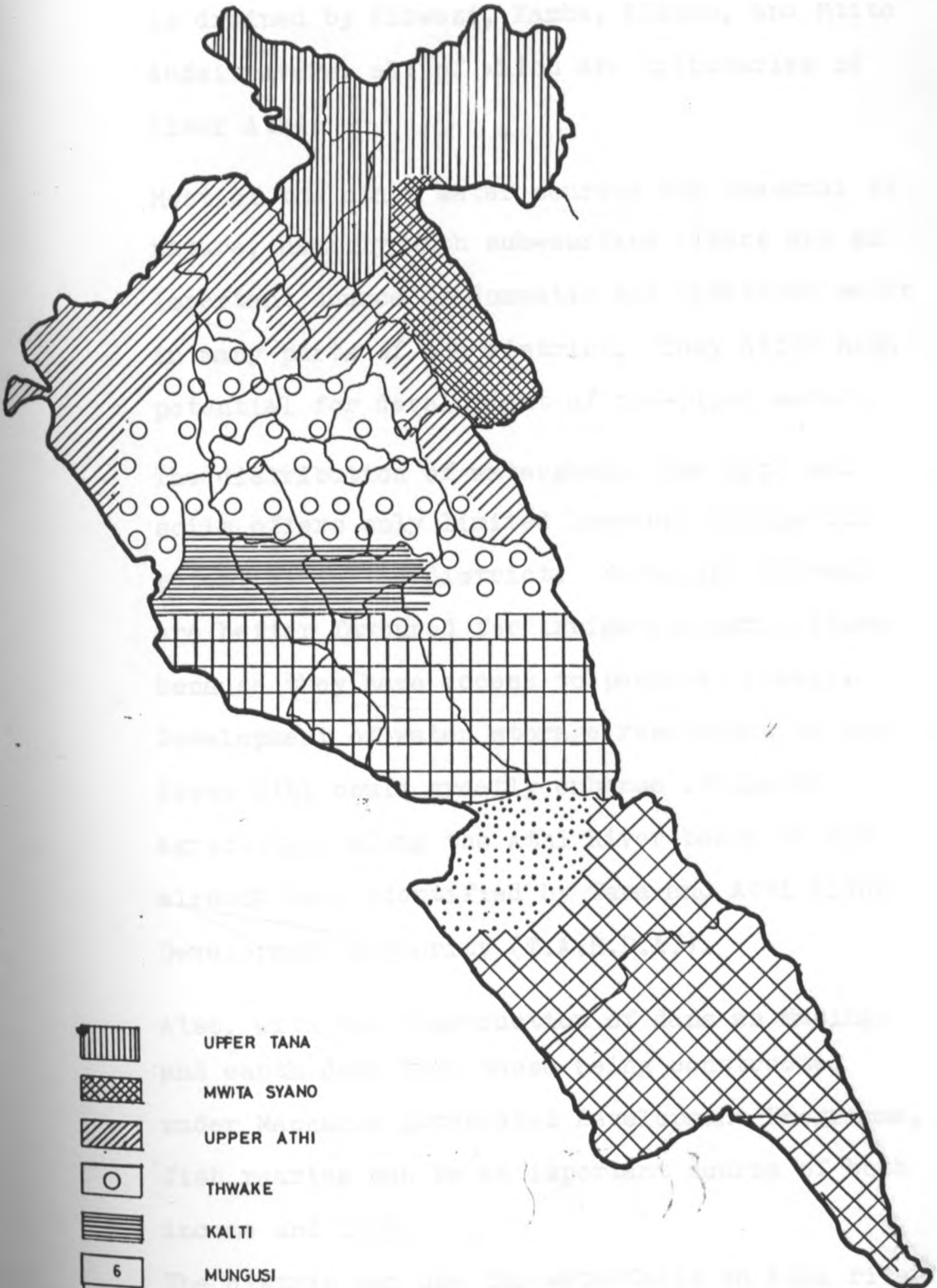
2.2.3 WATER RESOURCES: The major perennial rivers in the District are Athi River, Tana river and Thika rivers which drains the northern most parts of the district. Machakos, Kilungu and Mbooni hills have a few perennial streams whose flow is extremely intermittent at low altitude.










MACHAKOS DISTRICT

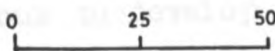
MAJOR WATERSHEDS

NAME	KARIUKI J.N.
CANDIDATE	M.A. PLANNING
DEPARTMENT	URBAN REGIONAL PLANNING
DATE	JUNE 1986

MAP NO 3



-  UPPER TANA
-  MWITA SYANO
-  UPPER ATHI
-  THWAKE
-  KALTI
-  MUNGUSI
-  KIKUU
-  KIBOKO
-  UPPER ATHI



The few perennial springs and streams in the district offer potential for piped and gravity fed water schemes for domestic and livestock uses in the low altitude areas. Kibwezi division is drained by Kibwezi, Kamba, Kiboko, and Mtito Andei rivers, all of which are tributaries of River Athi.

Most of the other water sources are seasonal in nature, usually with sub-surface rivers are an important source of domestic and livestock water in many parts of the district. They offer high potential for development of non-piped water.

The distribution of watersheds (see map) and soils offers only limited low-cost irrigation potential in the district. Yatta and Kibwezi are better favoured for irrigation agriculture because they have access to perennial rivers.

Development of water storage reservoirs on the River Athi could greatly enhance irrigated agriculture along the Athi River basin as has already been identified by Tana and Athi River Development Authority (T.A.R.D.A.).

Also, with the construction of dams as Masinga and earth dams like those being constructed under Machakos Integrated Development Programme, fish rearing can be an important source of both income and food.

The district can use the waterfalls on Athi river at OI Donyo Sabuk to develop hydro-electricity

for local consumption.

2.2.4 CLIMATE: Rainfall in Machakos district varies roughly with altitude. The average annual rainfall ranges from slightly over 1,000 mm, in some of the highlands to slightly below 500 mm in the low-lying South and South-East parts of the district.

The rainfall has a bimodal pattern with significant difference in distribution during different years, as can be noted in Table...²..., based on data from Machakos town. The two rainy seasons occur from March to April and from November to December. However, as can be seen from Map and Table, most of the district falls in the semi-arid ecological zones (IV - VI) rendering agricultural practices as expensive and unreliable.

TABLE 2

ANNUAL RAINFALL TOTALS FOR MACHAKOS (mm)

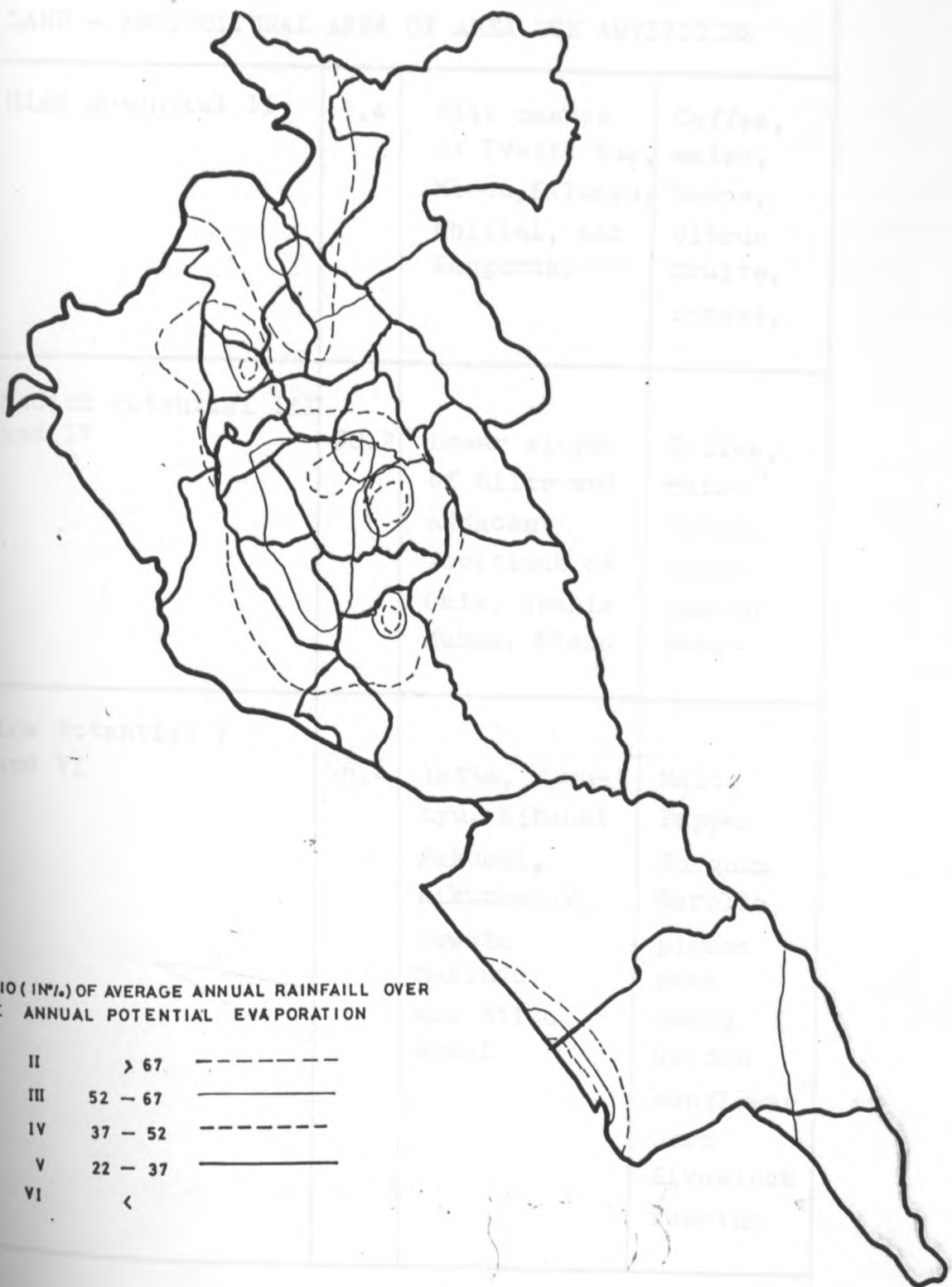
1973/80

YEAR	1973	1974	1975	1976	1977	1978	1979	1980
RAIN-FALL	772.7	897.6	722.3	670.8	955.7	1112.9	1226.1	1021.1

MACHAKOS DISTRICT
AGRO-CLIMATIC ZONES

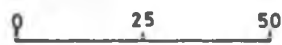
NAME:	KARIUKI J. N.
CANDIDATE:	M. A. PLANNING
DEPARTMENT:	URBAN - REGIONAL PLANNING
DATE:	JUNE 1986

Map No.4



THE RATIO (IN%) OF AVERAGE ANNUAL RAINFALL OVER AVERAGE ANNUAL POTENTIAL EVAPORATION

II	> 67	-----
III	52 - 67	=====
IV	37 - 52	-----
V	22 - 37	=====
VI	<	



* DISTRIBUTION OF AGRO-ECOLOGICAL ZONES

AGRO-ECOLOGICAL ZONE PERCENT OF DESCRIPTION MAIN LAND - AGRICULTURAL AREA OF AREA USE ACTIVITIES			
High potential II	5.4	Hill masses of Iveti, Mua, Mboon, Kilungu, Mbitini, and Kangundo.	Coffee, maize, beans, Citrus fruits, forest.
Medium Potential III and IV	38.2	Lower slopes of hills and adjacent locations of Okia, Nzania Mukaa, Kisau	Coffee, Maize Cotton beans pigeon peas
Low Potential V and VI	56.4	Yatta, Wamunya, Kibauni Makueni, Kikumbuluyu Ngwata Makindu, and Mtito Andei	Maize Pepper Sorghum Karella pigeon peas beans Cotton Sunflower Okra Livestock rearing
100%			

2.3. SOCIAL-ECONOMIC CHARACTERISTICS

2.3.1. POPULATION DISTRIBUTION AND PROJECTIONS: At the time of the 1979 census, the district had a total population of 1,022,522 of which 36,400 or 3.5% live in the Yatta furrow area to be discussed later. The population has increased by 44.6% from the 1969 census at an inter-censal growth rate of 3.76% per annum, which was near the national average annual growth rate. The projected population distribution by administrative division, using Central Bureau of Statistics (C.B.S.) projected annual growth rate of 4.11% for Machakos district between 1980-1990.

2.3.2. MIGRATION TRENDS: Within the district, people have tended to migrate from the densely populated, high potential areas where there is population pressure on the land to low potential areas where there is still adequate land for human settlement. The net migration trend according to 1979 census, indicates more people leave the district than come into it.

2.3.3. EMPLOYMENT AND INCOMES: *A great majority of the district labour force is self employment in the rural sector, mostly on small holdings numbering approximately 332,000. The holdings raised at least K£15,389,939 in 1982 or about K£45-50 per household.

There are no available district specific data on rural income levels. However, the data available (see Table) gives indications of farming as major income source. C.B.S., 1980 data on wage employment for Machakos district indicate that the total wage employment figure was 32,339. The total yearly earnings were Kshs.35,076,000 on average of Kshs.1,005 per annum. Urban employment (Machakos and Athi River) was 20.8% of the total employment. Rural commerce and transport are also a major source of income all over the district.

From general observations, average family incomes vary directly with potential of agro-ecological zones.

TABLE 3

ESTIMATED VALUE OF FARM SOURCES OF INCOME BY MAJOR ACTIVITY (1982)

<u>FARM PRODUCE</u>	<u>K£</u>	<u>REMARKS</u>
Milk	155,392.1	This is for milk sold to societies only
Beef	5,064,375.0	
Sheep and Goats	4,250,000.0	
Eggs	134,400.0	
Poultry	37,073.1	
Honey	375,000.0	
Bee Wax	7,875.0	
Coffee	1,761,550.0	
Cotton	662,131.3	
Maize	174,538.9	
Sunflower	1,243.0	
Beans	888,050.9	
Pigeon Peas	278,250.3	
Cow Peas	429,134.4	
Sorghum/Millet	173,925.0	
TOTAL	15,385,939.0	

NOTE: These figures represent marketed produce. The income in kind, which is quite substantial, is not reflected

2.4. LAND-USE POTENTIAL

2.4.1. OVERVIEW: In most parts of Machakos district, sufficient water of any kind is largely unavailable. It is therefore hardly possible to find an under-utilized water facility, if the facility is being used at all unless for technical reasons. A quick overview across the district reveals that only Thange in Kibwezi, Wote in Makueni, Wamuyu in Iveti South and Siathani in Kangundo and Kinyatta/Kombo in Yatta division are completely underutilized domestic water facilities due to technical and financial reasons.

Since most of the projects are small in nature, seeing less than 5,000 persons, this implies that the majority of the district's population has little or no access to a developed, reliable water facility.

Successful irrigation schemes in the district are very few because of the very little perennial sources of water. Thus only limited low-cost irrigation potential exists in the district with exceptions of some divisions like Yatta and Kibwezi which are better favoured for irrigated agriculture because they have more access to perennial rivers.

Although the biggest portion of Machakos district lies within the low-potential agro-ecological zone represented by 56.4%, the biggest constraint to agriculture and land-use development is basically due to lack of adequate water supplies.

2.4.2. AGRICULTURE AND FORESTRY

CROP PRODUCTION: Since the district cannot heavily rely on perennial water sources for agriculture, the majority of the people still depend on the rains for crop production which has a bimodal pattern as described earlier. Through that source of water subsistence

food crops are grown both for incomes and nutrients as well as commercial crops purely for income generation. With great variations in quantities of water derived from rain as depends with topography and general climatology of the region, crop production trends also seems to vary accordingly. The agricultural annual reports have indicated notable changes in both the area under crops and crop yields since 1979. Areas under major food crops in the district, namely maize, beans, sorghum/millet, cowpeas and pigeon peas, rose in 1982, substantially over 1979 figures. The highest rise of 189.9% was recorded for the bean crop and the lowest (93.7%) for maize. Area under green grams fell by 4.5%, cassava by 8.2% and sweet potatoes by 63%.

Despite the substantial increase in areas under crop production, figures for the same period showed bean production fell by 21.5% and Sorghum and millet by 28.4%. Maize yields rose by 27% and cassava by 56.8%. Cowpeas and pigeon peas production rose by over 400%. Yields in horticultural crops were also quite encouraging with specific reference to those grown in Yatta Irrigation Scheme and Kibwezi. Only bananas recorded high increases. Other crops with positive change were onions (27.5%), citrus fruits (160%) and Mangoes (6.6%).

Changes in industrial crops, namely coffee, cotton, sunflower, wattle and sisal, are mainly negative, with coffee yields having gone down by 27% and cotton by 29%. Since area under coffee rose by 60%, low yield could be attributed to price and inadequate extension advice on farms and at coffee factories.

2.4.3. LIVESTOCK DEVELOPMENT

As of the end of 1982, the district had a total of 297 cattle dips and an estimated 452,320 heads of both beef and milk cattle. This average of about 1,520 heads of cattle per dip is too high as compared to a desirable planned number of 600 animals per dip; dipped once a week. One dip is meant to serve an average of 48 sq. Km which is a district average distance of 3.5-4 Km to a dip.

Thus, a high degree (46.3%) of dip overutilization district wide occurs ranging from 2.3% in Kebwezi; to 9.1% in Yatta division. Underutilization representing 23.7% of all dips in the district is highest in Kangundo division, at 7.7% and lowest at Yatta and Kibwezi divisions at less than 1%.

The problem of overutilization of dips as in Yatta division can be reduced by the construction of more dips or by introducing a procedure of two dipping days per week. In Yatta, Kibwezi, and Makueni, where the average return trip to dips is more than 9Kms, the suggested strategy to overcome overutilization can be through the construction of more dips: Underutilization will be overcome as the number of cattle increases, as more private dips are taken over by the government for use by more farmers, and as farmer education intensifies demand for dipping.

2.4.4. FORESTRY

According to the Annual Report from District Forest Office, gazetted forests in Machakos district occupies 927.6 hectares (HA.) out of which 2,229.4 h.a. are under forest plantations, 9,277 under bush and 4,421.1 under protective forest. Forest plantations yielded some 886 cubic metres of timber in 1982. Direct employment in the forests was about 500 persons. With continued forest plantations and reforestation and

by reforesting and protected forest with exotic tree species, more income in cash and in kind and ore employment can be generated in the future.

2.5. NATURAL RESOURCES

2.5.1. MINERAL RESOURCES: Machakos district does not have known large quantities of minerals of economic value. These were, however, small scale mining operations in Kibwezi division in the mid-seventies. Information available does not indicate if the minerals were exhausted.

The district, however, has large quantities of building sand in the seasonal river beds, which has been earning local authorities and individuals high incomes from sand collection. In addition, many areas of the district have soil suitable for brick making. This type of soil is available in all divisions and has been used as a source of cheap building materials. Quarry stones are also available in Matuu in Yatta division, Kathaana in Kangundo, Kimutwa in Iveti South and those parts of Kalama location neighbouring Kimutwa. This resource is an important source of revenue to quarry owners and workers, besides being an important source of building material in the district.

2.5.2. WILDLIFE: This is an important resource in the district. There are National parks at Ol Donyo Sabuk, Kiboko, and Tsavo, occupying 459 sq.Km. The wildlife in these parks is a tourist attraction and hence a revenue earner.

2.6. PHYSICAL INFRASTRUCTURES

2.6.1. GRAIN STORAGE FACILITIES: During the previous plan period (1979/1983), 28 stores with a total capacity of 303,000 tons were constructed mainly by Ministry of Cooperative Development (M.C.P.) using the European Economic Community (E.E.C.) funds. The National Cereals and Produce Board (N.C.P.B.) is expanding Konza depot by 9,020 tons above its present capacity of 16,200 tons. Machakos and Kibwezi depots have a further capacity of 8,100 tons. This gives a total district storage of 336,320 tons. Thika N.C.P.B. store until recently was handling some crops from Yatta division and parts of Kangundo division. A new N.C.P.B. store is almost complete in Kithimani, Yatta division. There are numerous private stores operated by N.C.P.B. agents. There are also some farm stores which are currently being improved on pilot basis by M.I.D.P.

2.6.2. HEALTH: The increase in Health physical facilities throughout the district has led to improved health services. The level of services varies from division to division. Factors such as population/bed ratio, population served by a health facility, area served by a health facility, and population/doctor ratio have improved over their levels at the beginning of the previous plan period (1979-1983).

The distribution of doctors favours Iveti South, which has a population/doctor ratio of about 9,000 compared to district-wide ratio of 39,000. However, this situation is so because Iveti South division has a general hospital, which is a referral hospital for the whole province. Nonetheless, the division makes

significant use of non-referral services of the hospital.

It appears that the average distance to a health facility ranges widely across the district. On the other hand population served by a health facility varies from an average of 16,600 persons in Yatta division to 23,300 in Kangundo Division. Planning of new facilities will have to strike a balance between distance to a health facility and potential congestion in a health facility, if a rational improvement in health facilities is to be realised. Besides, siting of new hospitals, will need to give a high priority to Yatta, Mbooni and Kilome divisions, where doctors' services are not locally available within the division. However, these services could be made available to the divisions if the Ministry of Health(M.O.H.), either upgrades the newly constructed health centres to hospital status or has a policy of posting doctors to the health centres. It would appear that priority in increasing hospital bed needs to be given to Yatta, Kilome, and Mbooni Divisions, which have high population/bed ratio. The hospital conditions for Iveti North and Iveti South are to be improved considerably when Kathiani Hospital starts operating.

From the health infrastructure inventory and utilisation study, the complete facilities are rendering

services, except that they require mainly staff houses, facility renovations and water and sanitary facilities to make them operate satisfactorily. Completing the partially implemented health facilities needs to be given high priority, as guided by Sessional Paper No. 4 of 1982. Congestion in the existing facilities and, in some cases, population/bed ratio will be reduced if these measures are undertaken.

2.6.3. EDUCATION

(a) PRIMARY EDUCATION

Primary education has been expanding since the beginning of 1979/83 plan period. The percentage of untrained teachers has improved from 49% in 1978 to 34% at the end of 1982. The number of classrooms has increased by 22.4% and enrolment by 15.7% over the same period. The district average underutilisation of class facilities is about 25-30% with Makueni Division recording the highest underutilisation level percentage. This implies that construction of new classrooms need to be increased in order to fill the gap between the growth rate in classrooms and in enrolment, thus raising the underutilisation level above the present level, with the assumption

of optimal utilisation of 50 pupils per class.

It is, however, known that many of the existing classrooms need a facelift. In some schools, though very few, a few children attend classes under trees due to lack of enough classrooms.

(b) SECONDARY SCHOOLS

Most of the secondary schools in the district lack laboratories. Pupils typically do not have adequate learning facilities. 65% of all teachers (950) in 1983, were untrained and 47% of the schools (out of 187) were underenrolled, indicating little need to open new schools except in places where schools were overenrolled and distances too great. The underenrollment is as shown below:

<u>Administrative</u> <u>Division</u>	<u>No. of Underenrolled</u> <u>Schools</u>
Yatta	12
Kilome	18
Makueni	24
Kibwezi	2
Iveti North	7
Iveti South	5
Kangundo	6
Mbooni	13
	<hr/>
	87

2.6.4. TRAINING INSTITUTIONS

After the primary and secondary schools and the teachers training college, the other educational and training institutions of importance in Machakos District are village polytechnics, which are 36 in total, a medical training school, community training centre, Farmers Training Centre, Family Life training centre, Adult education classes and 1,332 day care centres.

2.6.5. TRANSPORTATION NETWORKS

The transportation system of a region is fundamental to its economic development. In addition to functioning as the reins through which the life blood of a region flows. Good transportation facilities are essential for bringing the people of the remoter areas of the region into closer and more frequent contact with the ideas and opportunities of the better developed parts of the nation.

“In Eastern Province, the road system is fairly well developed in some of the most populated areas, but in many areas, it provides very poor communication with communities and trading centres and in some areas is non-existent. For many parts of the province the local roads are passable in good weather only, thus

communities are virtually isolated for months during heavy rains. In wet weather, even some of the more important gravel trunk roads are subject to temporary closure to heavy vehicles.

In Eastern Province the road system is focused on two main roads from Nairobi. The first part consists of Nairobi-Thika road, A2 branching off at Thika to join Thika-Garissa road A3 which serves the Yatta region. The second part consists of Nairobi-Mombasa road A109, branching off to join C97 towards Kitui via Machakos. Of major importance is C100 which serves Kithimani and Machakos. See map No of road networks in Machakos district.

THE CASE STUDY OF - KITHIMANI AND MATUU

CHAPTER 3

3.1 INTRODUCTION

This chapter aims at giving the background information on Kithimani and Matuu centres. In particular, the study sets out the historical and socio-economic development of those centres, It is shown that urban developments in Kithimani took place due to administrative conviniences of the British Colonial government whereas development of Matuu was due to the real economic forces in the African Traditional markets. An appraisal of infrastructure in both centre against the present infrastructual levels to date will be set out for comparision purpose as shown in the summary.

3.2 LOCATION

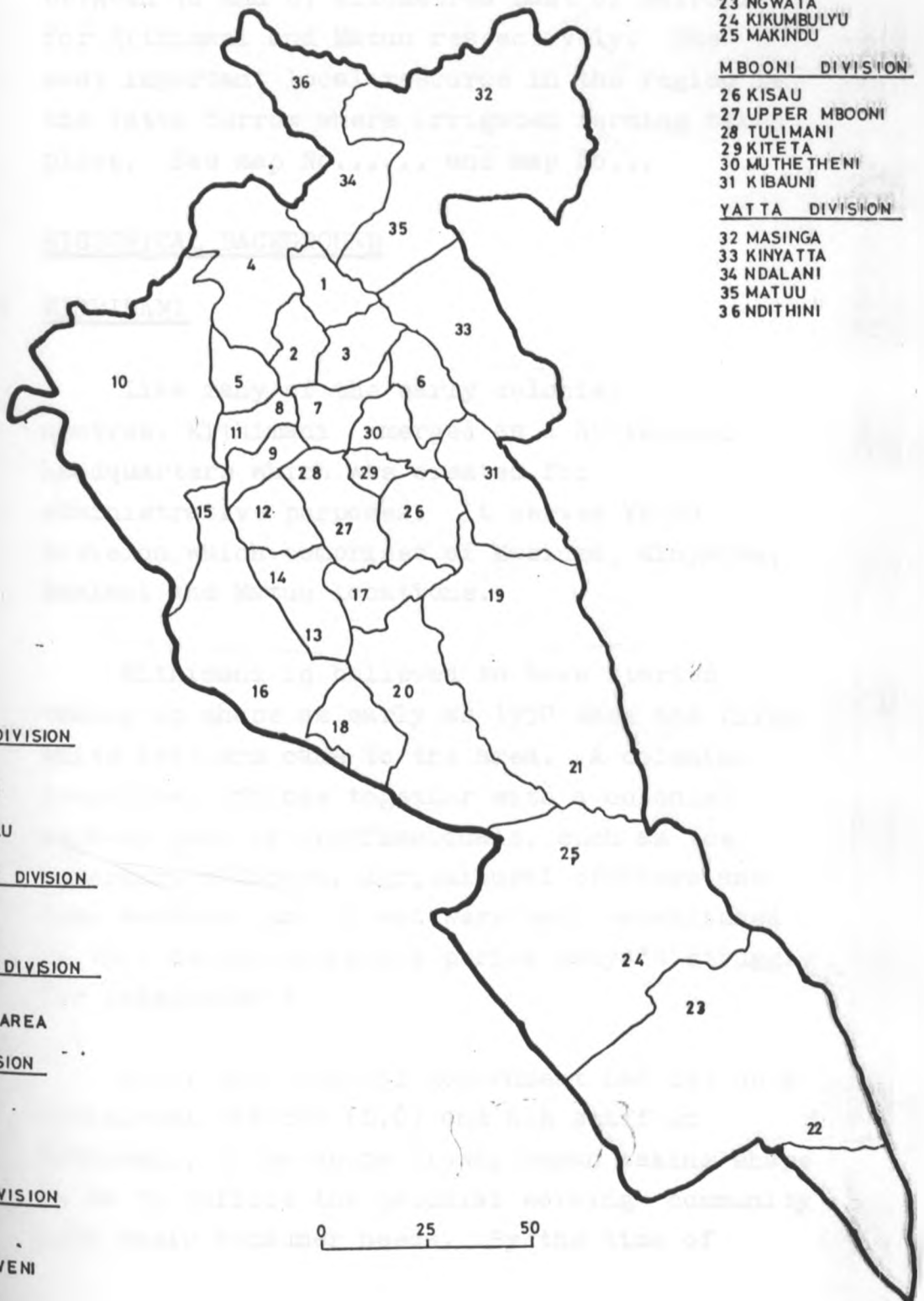
Kithimani and Matuu are located in Matuu location. This is one of the four administrative locations of Yatta division. Their approximate situation along the Yatta furrow which is thirty seven and a half miles long from the intake at Thika river to Mwitwa Syano is as follows. Along the furrow which is divided into one mile sections, Kithimani is located somewhere between mile mark 13 and 16 wheareas Matuu is located at about mile mark 30 of the furrow. Therefore, and

MACHAKOS DISTRICT

DIVISIONS AND LOCATIONS

NAME	KARIUKI J. N.
CANDIDATE:	M.A (PLANNING)
DEPARTMENT:	URBAN - REGIONAL PLANNING
DATE:	JUNE 1986

Map No. 5



according to their position along the Yatta furrow, these centres are 17 miles apart at the least. From the broader regional perspective, they can be said to be located between 70 and 87 kilometres East of Nairobi for Kithimani and Matuu respectively. The most important local resource in the region is the Yatta furrow where irrigated farming takes place. See map No..... and map No...

3.3 HISTORICAL BACKGROUND

3.3.1 KITHIMANI

Like many of the early colonial centres, Kithimani emerged as a divisional headquarters which was created for administrative purposes. It serves Yatta division which comprises of Masinga, Kinyatta, Ndalani and Matuu locations.

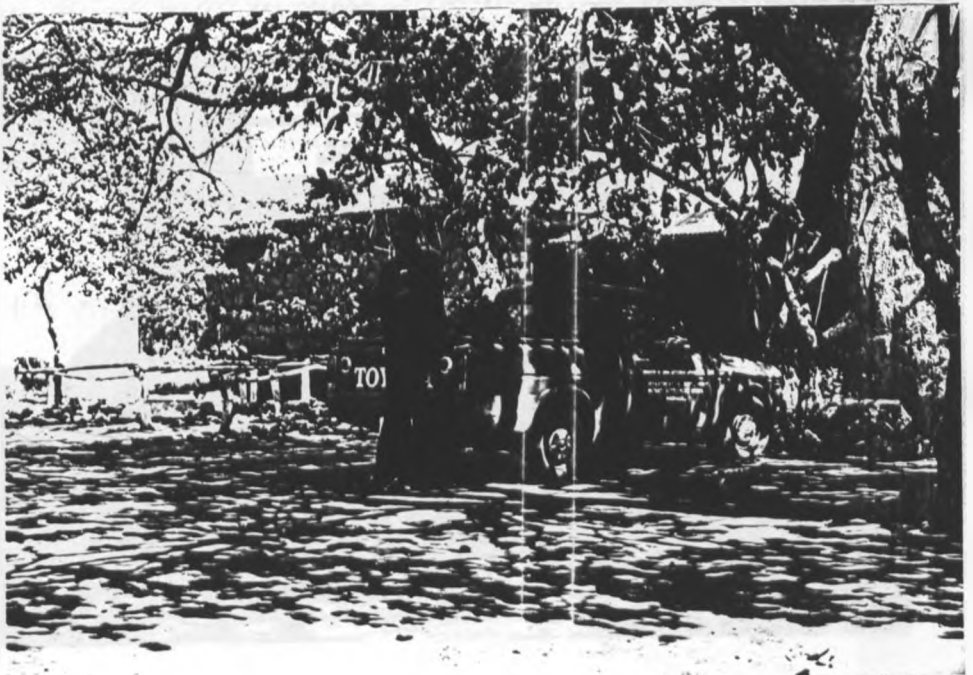
Kithimani is believed to have started taking up shape as early as 1950 when the first white settlers came to the area. A colonial divisional offices together with a colonial back-up team of professionals, such as the veterinary officers, Agricultural officers and Game Wardens came in and were well established by 1952 during emergency period Kenya's struggle for independence.

After the colonial government had set up a divisional officer (D.O) and his staff in Kithimani, a few shops slowly began taking shape so as to suffice the colonial working community with basic consumer needs. By the time of

Plate No.1



Offices of the various Ministries in
Kithimani Administrative Centre.



(a)



Kithimani, the Divisional headquarters

(b)



emergency, three African shops and an Asian canteen were operational. As such, Kithimani had a bigger market than those in the surrounding area, and served more to the need of the colonial government community more than to the needs of the local African population.

The core (as shown in photographs) and the bigger portion of the structures in Kithimani were indeed built before the Independence of Kenya in 1963.

After the Independence of Kenya, the centre has remained the divisional headquarters under the auspices of the Government of Kenya and where the relevant Ministry is concerned with rural development are located such as Ministry of Water development, Ministry of Cooperative development, Ministry of Culture and Social services and Ministry of Transport and Communications. As such Kithimani uptill the present time is an important administrative centre for Yatta division.

3.3.2 MATUU

Several theories exist about the early history of Matuu. It is believed that the Akamba settled down in the present Matuu area prior to the coming of the European invaders. The British colonial files from Yatta, between 1954-1963 speak of the present Matuu area. Although the stretch of this area had not been mapped out then, it can be concluded through the names of villages that it was approximately in or around the present Matuu's location.

Plate No. 3

(a)



Commercial Streets in Matuu Centre

(b)



This centre due to its close proximity to agricultural schemes happens also to be the most conducive place where the collection of horticultural produce is undertaken. This produce is collected in Matuu by different horticultural export agencies and delivered overseas via Nairobi. This undertaking is in fact an important income earner for the county council.

The livestock market is also a lucrative trade because of predominant cultural stake in stock-keeping around the centre. Part of the market place is roofed-in and at present the streets around the market place are asphalted. Therefore Matuu, is a significant focal point for social-economic development which goes to great lengths in serving the local demands in form of goods and services.

3.4 PHYSICAL BASE

3.4.1 CLIMATE

The climate where Kithimani and Matuu lie can be defined as semi-arid and in the low potential ecological zone (please see figure on Ecological zone iv). The mean maximum temperatures range from 22°C in July to 29°C February. The mean minimum temperature would range from about 12°C to 16°C.

The average minimum rainfall is around 730 a year decreasing slightly from West to East. The distribution is characteristically bimodal with the long rains occurring in March to May and

short rains October to December. The long rains and short rains each receive respectively an average of 45% and 40% of the total yearly precipitation.

.4.2 GEOLOGY

The geology of the area is composed of undifferentiated basement systems of archacan age and recent deposits. The basement system is believed to represent an original sedimentary series of limestones, shales and sandstones into which the rising temperature then resulted in these rocks being transformed into a highly folded metamorphic series.

The intrusive include granites which outcrop both as exfoliation surfaces and rugged tors. Also in stream courses, granite outcrops can be seen for short distances. The greater portion of granites is the conformable type and may probably be assigned to a single protracted period. The coarse porphyritic granite of the 'Lion Rocks' found in this area is probably the youngest granite of the younger granites of the area and is tentatively placed in the upper Archacan age. The lion rocks granite over the area of its exposure emerges mostly from black soil which predominates in the Eastern portion of the area including close environs of Matuu. It seems probable that the Lion Rocks granite was intruded as a dyke complex with modes forming the larger tors. Recent deposits include soil and alluvial sand deposits. Streams have worked over the area to give partly dissected peneplains which have gently undulating topography

with the high grounds tending to be flattopped. This partly dissected topography descends North wards from the flat higher ground of the Yatta plateau.

3.4.3 SOILS

Matuu location can be said to be dominated by three kinds of soil compositions. This mixture of soil compositions are Oxisols, Vertisols and Ultisols. Oxisols are generally intensively leached of all unweatherable residues and the most stable weathering products. Vertisols have more than 30% clay, especially rich in swelling days, characterised by deep cracks when dry and are high in nutrients (black cotton soils). Utisols are deeply weathered soils, enriched with clay and often highly coloured by iron-oxide occurring mainly on the hill masses described earlier, particularly in the high potential agricultural land. (see soil map for Yatta furrow area).

3.4.4 NATURAL VEGETATION

Largely due to the climatic conditions of the region, the natural vegetation is composed of dry bushland, thicket and woodland. The bushland is an assemblage of woody plants, mostly of shrubby canopy of less than 6 metres in height and a canopy of more than 20%.

The woodland is a stand of trees, up to 18 metres high, with an open or continuous but not thickly inter-laced canopy, sometimes with shrubs interspaced. Grasses, condusive

to livestock development and herbs dominate the ground cover.

The most common trees are the Acacia species (Acacia Albida and Acacia Senegal), Terminilia and Cammiphora species.

Widespread grass species are canhrus ciliaris and Hyparrhenia species.

3.5 SOCIAL BASE

3.5.1 CULTURAL BACKGROUND OF SETTLEMENT

Culturally, the Yatta furrow area is situated in the territory of the Akamba tribe in the North Western section. Ukambani (the territory of the Akamba) comprises mainly the present area of the Machakos and the neighbouring Kitue districts. The estimated Akamba population is approximately 1,000,000 of which 80% live in Machakos and Kitui districts and 3.6% in Yatta furrow and depend on it for agricultural farming. The intake of the Yatta furrow in the Thika River is bounded at, traditionally, Kikuyu territory. Due to Settlement history, minority of Kikuyu people are found along the Yatta furrow and most people belong to the Akamba tribe. Historically, it is believed that the Akamba settled down in the present area prior to the coming of the European invaders. The language of the Akamba, called Kikamba, belongs to the Bantu language group and shows a very close relationship with the Kikuyu, Meru, Embu tribes who have traditionally, their territories North of Ukambani.

Originally, Akamba were stock keepers but due to scarcity of grazing land, this way of life is diminishing considerably. The Akamba are becoming more inclined to mixed farming but keeping of livestock is still an important means of livelihood.

3.5.2 SOCIAL ORGANIZATION

The following aspects of the Akamba culture is important in the framework of this study because it suggests as it will be seen in the summary section of this chapter that cultural power has significant influence in decision making towards agricultural and non-agricultural matters. *The Akamba society consists of different levels of organisation, whereby the following social organization can be distinguished and have significant social, political and economic influences in the area and of which lay expression in the current urban development levels in Kithimani and Matuu.

(1) Musyi; (2) Mbai; (3) Age cycles.

1) Musyi (meaning, home and family)

This is the basic unit of the Akamba society containing both residence and official - consanguinal relations. Within the Musyi, monogamy, polygamy and extended family are found as ganic-relations

The extended family comprises of grand parents, parents, siblings and collateral relatives. The Musyi is not only an economic alliance but it is a composite of many institutions; family

education, religion and adaption to the environment and organically connected with the rest of the Akamba social organisation. The number of people with a musyi may range from a few to several hundreds.

2. Next to the Musyi is the Mbai,

The clan organization people of a Mbai trace their line of descent plan a known (mythical) hero, although the direct line to the founder of a mbai stays vague. A lineage within a Mbai can be considered when people tracing their descent approximately five generation back.

Many of the functions of a Musyi can be found back in the Mbai, and it is merely a high level organisation in which a common (mythical) ancestor, social control, rules, and sanctions serve as mechanism to keep a group of people ranging from a few thousands to several thousands together.

Each Mbai specializes in certain resources of the environment and exploit these for some section of Akamba population. The Mbai is therefore a 'sympatric group' an adaptive mechanism, 'to prevent the exhaustion of the environment of thw whole Akamba tribe. Hence, a Mbai as such has no territorial claims.

3. Age Cycles

Have the functions of socialization in which each cycle can be considered as a step towards biological and cultural 'maturity' enough to judge over matters concerning the Akamba life.

SUMMARY ON SOCIAL ORGANIZATION

The following remarks can be made about the described aspects of Akamba culture.

a) The Council of Elders or "Utui" elders are still in charge of land-cases. President Moi issued a directive in January, 1981 saying that before a land case can be brought before court, it must have passed council of elders.

b) Although the Mbai has lost many of her old functions, it is still at the background a factor of power of some significance. According to informants, Mbais are usually composed of leaders, and hence members of the council of elders and compose a high proportion of the rich farmers in the area of which several hold or have held previously leadership positions in public functions. It seems however, that those who hold the power positions are more eager to up-keep the old structures than the average farmer and especially the young farmer.

c) The Musyi still forms the basis of the Akamba society, although some of her functions are omitted, such as schooling. Polygyny a matter of wealth of a man still occurs and also the extended family can still be found as one of the gamic relations of a musyi. The number of people of a musyi in the canal area amounts to about 40 to 40 and forms one of the basis of all kinds of concerted efforts and outside the field of agriculture.

3.6 ECONOMIC BASE

3.6.1 INFRASTRUCTURAL SERVICES

3.6.2 INTRODUCTION

In the forecoming section, the infrastructural inputs in Kithimani and Matuu will be examined before and after the designation of these towns as service centres. This infrastructural appraisal between the two time periods is meant to suggest the pace of infrastructural development in both centres upto the present levels. This sub-section will be the spring-board of which specific factors will be examined as to why the infrastructural inputs at different levels have ended up where they are in the coming chapter.

3.7 KITHIMANI

3.7.1 WATER

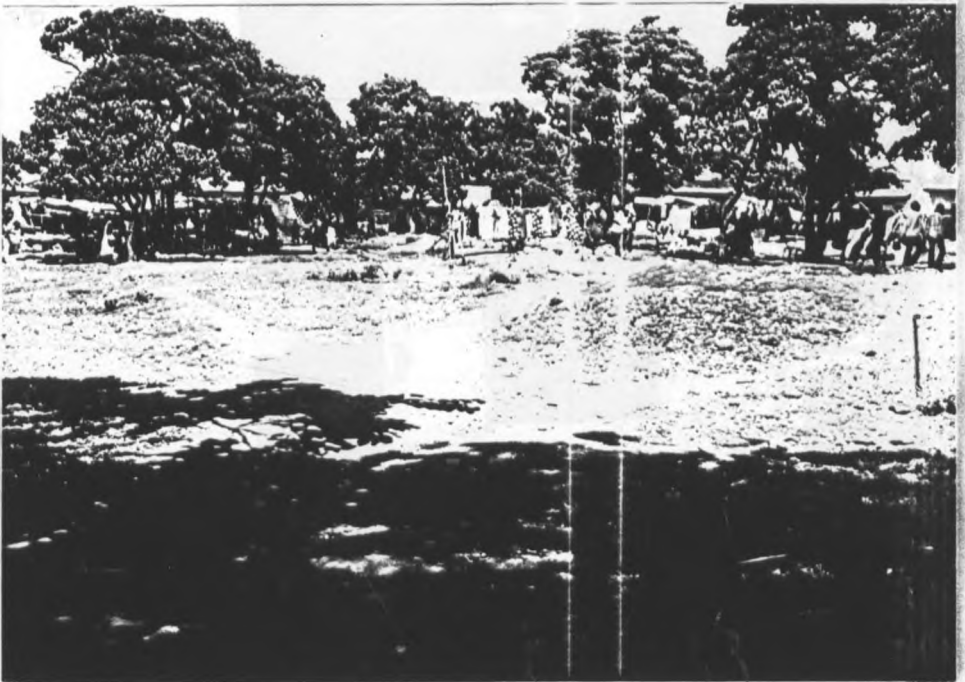
Kithimani has a local domestic portal water supplies that is largely under-utilized due to the frequent shortages of sufficient fuel for running the diesel pump and the inadequate supply of water from a bore-hole source. These deficiencies occur partly because of the lack of electricity in the centre and the dwindling source of water that is now-insufficient. As such, the domestic water supply is hardly available to the local residence which necessitates them from buying water from a private borehole owned and operated by Matungulu Ranching company

Plate No.4

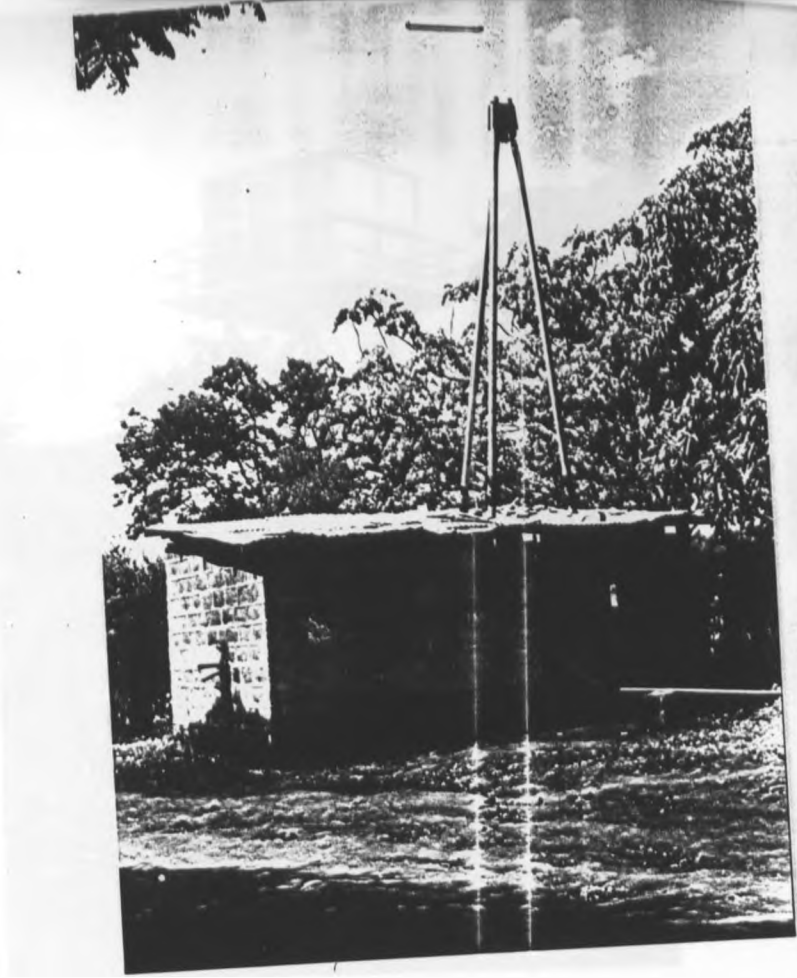


ABOVE, is KITHIMANI CENTRE AND
BELOW IS KITHIMANI MARKET.

Plate No.5



(a)



Above, Kithimani's old water source

(b)



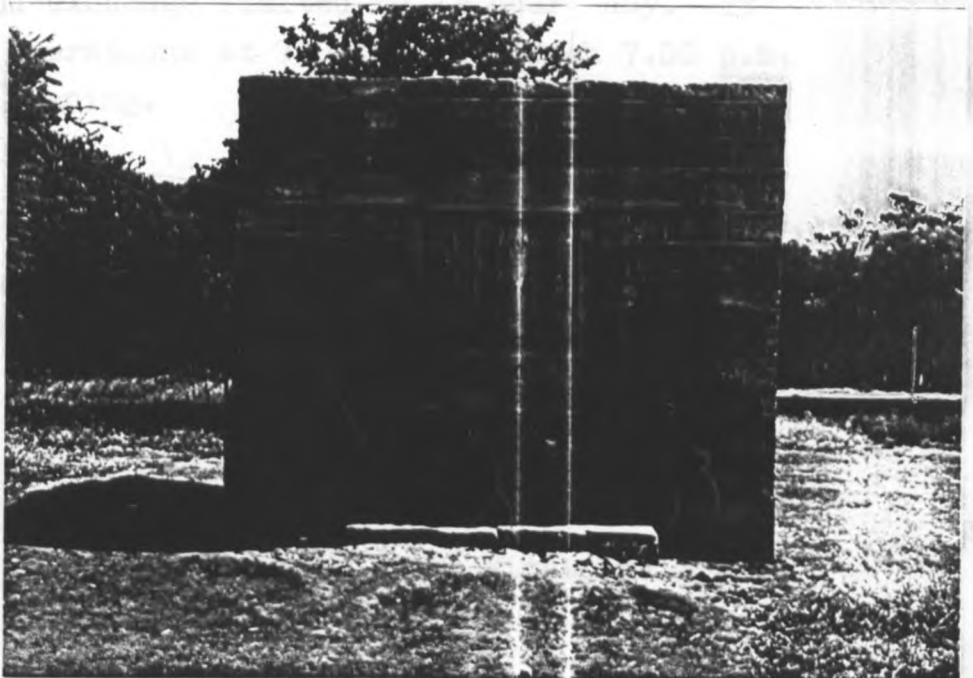
New water facility under construction
Kithimani

Plate No. 7



Private Water installation in
Kithimani School.

Plate No. 8



Matungulu Ranching Company water facility

or reside to collect water from the Yatta furrow for both drinking and washing purposes. This water cannot be assured of proper and standard health requirements according to its use. The furrow in the past has been associated with the out-break of cholera in this region which has a lot of bearing to poor and unsanitary conditions of a place. The sanitary condition of Kithimani is poor due to lack of a public sewerage disposal system.

3.7.2 POWER

Kithimani does not have power in form of electricity and hence depends largely to diesel power to operate generators for lighting and pumping of water depending on its availability.

3.7.3 COMMUNICATIONS

This centre is included in the National Telephone Network system which has a man-operated exchange limited to 12 hour day. It begins operations at 7.00 a.m. through 7.00 p.m. in the evening.

3.7.4 POSTAL SERVICES

A departmental postal services is available in Kithimani. It provides 99 postal mail boxes to the local residence.

3.7.5 HEALTH

A dispensary is located in Kithimani. This

health facility is not provided with electricity, proper water and sanitary facilities and has a clinical officer as its highest medical level. It offers only out-patient services. (see figure on the attendance trends for health facility in Kithimani)

27* KITHIMANI (AUGUST 1985) TABLE 4

HEALTH ATTENDANCE FOR KITHIMANI (1985)

CENTRE	MONTH	NATURE OF ATTENDANCE	NO. OF ATTENDANCE
KITHIMANI	AUG.1985	TOTAL NEW CASES	1602
		RE-ATTENDANCES	422
		NO. OF FIRST ATTENDANCES	DATA NOT AVAILABLE

This dispensary is not provided with electricity, proper water and sanitary facilities and has a Clinical Officer as its highest medical officer. It offers only out-patient services.

3.7.6 EDUCATION: EDUCATION INSTITUTIONS

28* *The number of Educational institutions are as follows:-

TABLE 5

KYATTA DIVISION	NO.	TYPE OF INSTITUTION
	170	(i) - Nursery Schools
	165	(ii) - Primary Schools
	16	(iii) - Secondary Schools
	1	(iv) - Other education institutions e.g commercial college)

Below is a table showing the number of institutions that serve the Kithimani residence or are in the catchment of Kithimani according to the Education office in Machakos.

TABLE 6 EDUCATIONAL ENROLLMENT

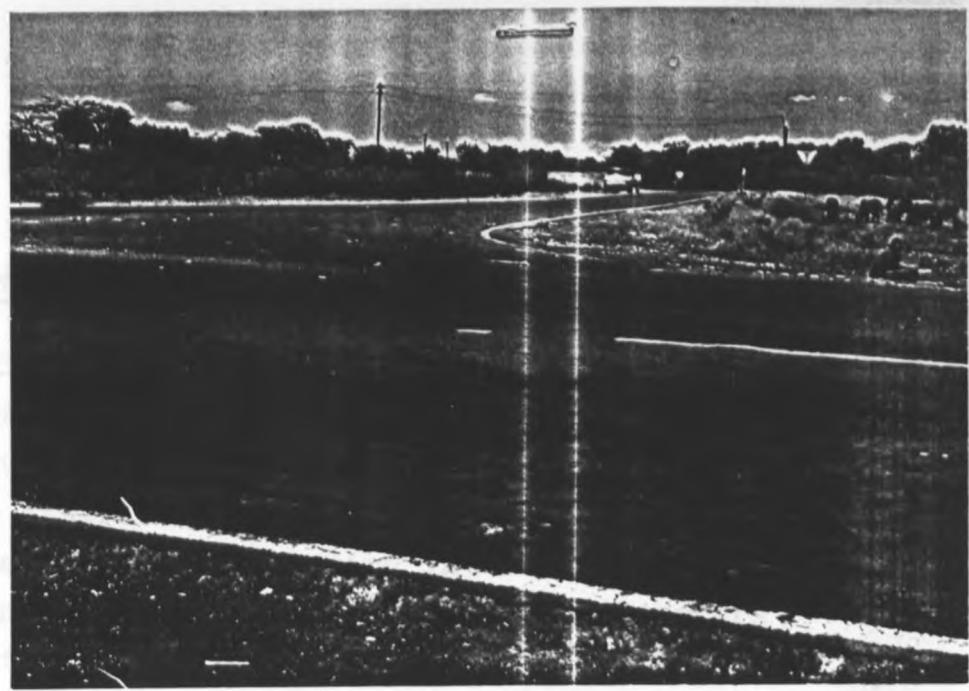
CENTRE	TYPE OF INSTITUTION	NO	ENROLLMENTS
KITHIMANI	NURSERY SCHOOLS	30	1600
	PRIMARY SCHOOLS	22	8251
	SECONDARY SCHOOLS	3	347

TOTAL ENROLLMENT

NURSERY SCHOOLS	7,597
PRIMARY SCHOLLS	48,084
SECONDARY "	1,761

According to enrollment in the different types of Educational institutions within the centre, Kithimani has 21% of the total divisional enrollment in nursery schools, 17% in primary schools and 19% in secondary school enrollments.

(a)



Above, By-pass of C100 by Thika-Garissa road, A3

(b)



Dusty road towards the divisional headquarters.

3.7.7 TRANSPORT

Kithimani is dissected by Primary Road; C100 which heads southwards to join with C97 at Makutano heading towards Machakos town which is the district headquarters and thus has quite a lot of communication interactions with Kithimani which is the divisional headquarters for Yatta. This road network; C100 up to Makutano is not asphalted and is in poor conditions. It is however motorable during the dry spells of the year and totally impassable during the rainy season. To the North about a kilometre long, Kithimani is by-passed by the International trunk-road A3, which has good connections for Nairobi, Thika, Matuu and Kitui. Also, and of less significance, E468, a secondary road serves Kithimani and Matuu centres. In fact this was the Old Thika-Garissa road before its re-alignment on the early 1970's. This road is largely neglected and is only passable between certain stretches during the dry season and totally impassable i.e. in the wet season. By means of buses and matatus (Public transport), connections are available for Thika, Matuu and Machakos via Kabaa.

3.8 INFRASTRUCTURAL SERVICES: MATUU

3.8.1 WATER

Matuu is supplied with a portal water supply from a bore-hole source. The reliability of the water source is good and sufficiently serves the local population with ample supplies of water for domestic and commercial purposes. Little problems are encountered in terms of power to run

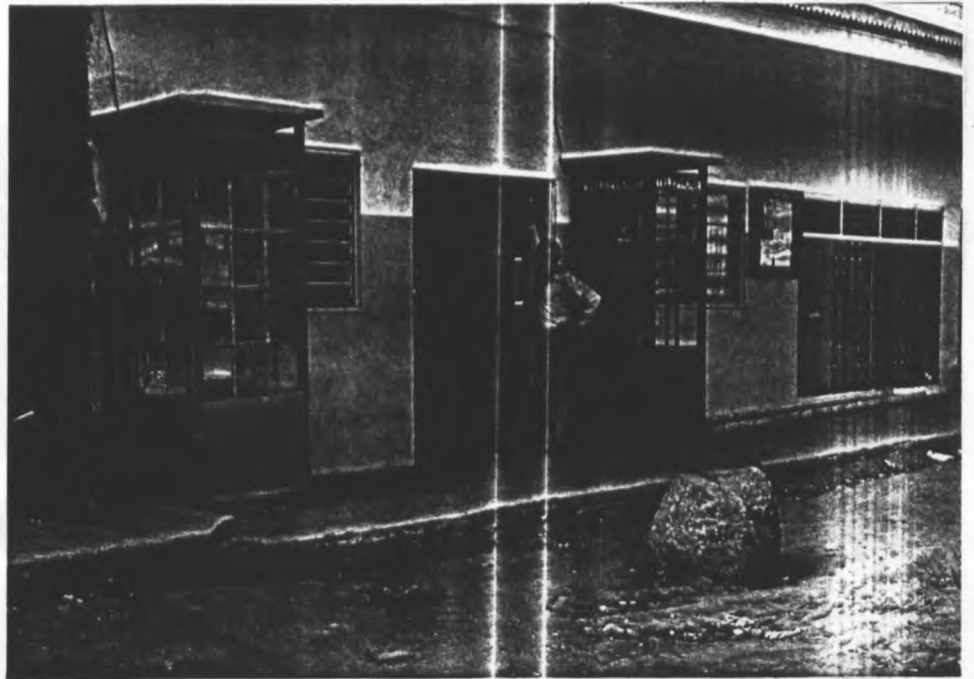
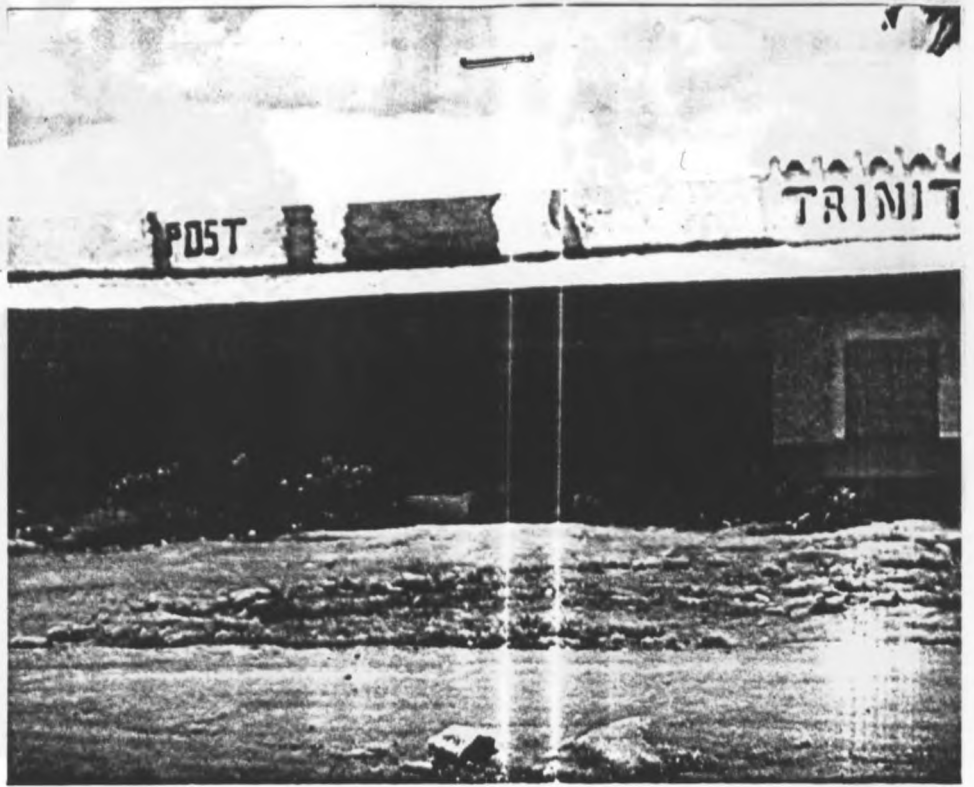
the pump due to the availability of electricity. Only rarely does the water pump break and the reticulation of the water-pipes are technically up to standard. Thus, Matuu does not have major problems like Kithimani in terms of unavailability of sufficient portal water for domestic purposes. However, this centre is not provided with a sewage disposal system and hence the sanitary condition is poor.

3.8.2 POWER

This centre enjoys the provisions of electricity. This provision was made available in 1980 through a presidential directive which stated that Matuu should be able to get the benefits of a local resource (Hydro-electric power-H.E.P- is generated in Kindaruma dam in the nearby Embu district) because of its locational proximity and the justifications made by the apparent high level of lucrative commercial and Industrial (light) developments in the centre. Social and economic undertakings have especially benefited by the provision of electricity in terms of efficiency of operations and increased facility inputs for services.

3.8.3 COMMUNICATIONS

Matuu is included in the National Telephone network and was modernized in 1984 through the installations of a 24 hour automatic exchange system known as the S.T.D. This facility, allows for a free-flow of information for telephone owners on a twenty four hours a day basis unlike the Kithimani which is closed out to



Post Office in Matuu

(a)



ABOVE; Kithimani Dispensary

BELOW; Rural Health Demonstration Centre in
Matuu

(b)



information flow between a twelve hour period of of a twenty four hour time horizon.

With a lucrative social complimentarism with other important centres in the region, ie. Thika, Kitui Embu, Nairobi etc, this facility is an invaluable asset to the present and future growth of this centre.

3.8.4 POSTAL SERVICES

Matuu has a full departmental postal services. It deals with all postal services which includes at a higher level of service to parcel deliveries. It has 999 postal mail boxes, or 90% more mail box facility than Kithimani. The variety of postal services and the high standards of operations in Matuu shows clearly that there exists a high level of postal communications between its residence and the region. (see plate No.)

3.8.5 HEALTH

This centre has a health centre which is adequately furnished with appropriate medical facilities due to the availability of electricity. According to the attendance trends of patients in this health facility, it shows that it attends to almost twice as much patients than that in Kithimani.

29* HEALTH ATTENDANCE IN MATUU: TABLE 7

CENTRE	MONTH	NATURE OF ATTENDANCES	NO. OF ATTENDANCE
MATUU	AUG.1985	TOTAL NEW CASES	2136
		RE-ATTENDANCES	551
		NO. OF FIRST ATTENDANCES	1548

3.8.6 EDUCATION

Below is a table showing the number of institutions that serve Matuu or are in the catchment of Matuu according to the Machakos District Education Office.

EDUCATIONAL ENROLMENT IN MATUU: TABLE 8

CENTRE	TYPE OF INSTITUTION	NO	ENROLLMENT
MATUU	NURSERY SCHOOLS	31	1,559
	PRIMARY SCHOOLS	30	9,948
	SECONDARY "	5	501

TOTAL ENROLLMENT FOR YATTA DIVISION

TABLE 9

TYPE OF INSTITUTION	NUMBER ENROLLED
NURSERY SCHOOLS	7,597
PRIMARY SCHOOLS	48,084
SECONDARY SCHOOLS	1,761

According to enrollement enumerations, Matuu offers 20.5% of the divisional enrollment in nursery schools, 20.6 % for primary school and 28.4 in Secondary education. Thus, there are more educational institutions within Matuu's educational catchment that illustrates the bigger awareness of the people in Matuu to education unlike in Kithimani. This growing awareness of the importance of education in Matuu

has created a demand for education facilities and especially in Secondary education where its enrolment is 28.4 fo the divisional enrollment in secondary school caterory unlike Kithimani that represents only 19% of her residents in the same category.

3.8.7. TRANSPORT NETWORK

Matuu is cut through by the International Trunk Road, A3, or locally known as Thika-Garissa Road. This road is of high standards and was asphalted upto Matuu in 1981. It gives Matuu a superb accessibility to Thika, Kitui and Garissa. Connections are also available to Embu through National trunk road; B7, and to Machakos through Primary road, C100 via Kithimani and Kabaa. Its connectivity to major centres towns like Nairobi, ~~Thika~~, Thika, Kithimani (divisional headquarters), Kitui, Embu and Machakos is therefore very good as compared to Kithimani which is largely by-passed by International trunk road; A3; which is vital for accessibility to the above mentioned. centres of significant complimentality in terms of trade and services. (See Map on transportation networks). By means of Matatus and buses, connections are maintained in the direction of Thika, Garissa, Kitui and Embu.

Centralized interactions began with a grazing settlement in the 'Matuu area' in 1950 when the British had made the region free from tsetse flies which are very destructive to livestock development in an area where the main pre-occupation is stock-keeping.

The first signs of social economic developments in Matuu began in 1956 when permanent structures began to be built in order to facilitate trade which was then at a low level. This was made possible through the allocation of plots by the colonial government to the Akamba people in Matuu because they were known to be good in that they did not actively engage in Mau Mau movement group that took a violent strategy in the struggle of Kenya's independence.

Small permanent structures were built within the allotted plots for commercial operations as early as in the mid-nineteen fifties. *These small shops and tea hotels are of vital social significance in their relative social attraction especially in traditional market centres. A government bore-hole was used to serve the local people with water in the area at that time but was closed in 1969 by Masaku County Council due to salination problems.

Currently, the market at Matuu is already of regional importance and traders come from as far as Nairobi and Kitui during the market days on Wednesdays and Saturdays. Not only are vegetables and fruits sold but cloths and tools.

3.9. A SUMMARY OF INFRASTRUCTURAL SERVICES BY LEVEL OF DESIGNATION IN MACHAKIOS DISTRICT FOR KITHIMANI AND MATUU.(1970)

RURAL CENTRE		MARKET CENTRE	
KITHIMANI		MATUU	
POINTS		POINTS	
2	X	DIVISIONAL HEADQUARTERS CHIEF'S' CAMP	
3	X	WATER SUPPLIES ELECTRICITY	
2	X	TELEPHONE (12 & 24 HR EXCHANGES	
1	X	POLICE STATION COMMERCIAL BANK	
2	X	DEPARTMENTAL POST OFFICE OR AGENCY	
		X	2
		HOSPITAL HEALTH CENTRE	
1	X	DISPENSARY	
3	X	X	3
2	X	X	2
2	X	X	2
3	X	SERVED BY INTERNATIONAL ROAD	
		X	3
2	X	" " PRIMARY ROAD	
1	X	" " SECONDARY "	
		" " MINOR "	
2	X	RETAIL SHOPS(1-4; 1point 5-49; 2 points, 50>3 50 3 points)	
		X	2
1	X	OPEN MARKET (GRADE A: 3 point, B 2 points C 1 point)	
		X	2
		RESIDENTIAL HOTEL SAFARI LODGE	
TOTAL POINTS		TOTAL POINTS	
27		16	

3.9.1 A SUMMARY OF INFRASTRUCTURAL SERVICES BY LEVEL OF DESIGNATED CENTRES IN MACHAKIS DISTRICT FOR KITHIMANI AND MATUU. (1985)

RURAL CENTRE KITHIMANI			MARKET CENTRE MATUU	
POINTS		SERVICES	POINTS	
2	X	DIVISIONAL HEADQUARTERS	X	4
--		CHIEF'S CAMP	X	1
3	X	WATER SUPPLIES	X	3
--		ELECTRICITY	X	3
2 (12 HR XCHANGE)	X	TELEPHONE (12 & 24 HR EXCHANGES)	X	3 (STD)
1	X	POLICE STATION		--
--		COMMERCIAL BANK	X	3
2 (POSTAL AGENCY)	X	DEPARTMENTAL POST OFFICE OR AGENCY	X	3 (DEPT)
		HOSPITAL		
		HEALTH CENTRE	X	3
1	X	DISPENSARY		
3	X	SECONDARY SCHOOL	X	3
2	X	PRIMARY SCHOOL	X	2
2	X	BUS SERVICE	X	2
BY-PASSED		SERVED BY INTERNATIONAL ROAD	X	3
2	X	SERVED BY PRIMARY ROAD	X	2
1	X	" " SECONDARY "	X	1
		" " MINOR "		
2	X	RETAIL SHOPS (50,3points 5-49,2 points; 1-4, 1 point)		
1	X	OPEN MARKET (GRADE A, 3 points; B, 2 points, C, 1 point)	X	3
		RESIDENTIAL HOTEL		
TOTAL POINTS 24				TOTAL POINTS 38

See the Key point system below:

DESIGNATION BY POINT SYSTEM (in order of increasing importance)

<u>POINTS</u>		<u>DESIGNATION</u>
8-12	-----	Local Centre
13-18	-----	Market Centre
19-36	-----	Rural Centre
37 >	-----	Urban Centre

SUMMARY ON INFRASTRUCTURAL SERVICES

According to the appraisal of infrastructural services in 1970, when these centres were designated, Kithimani had a superior status than Matuu due to a higher concentration of services scoring 27 points whilst Matuu scored only 16 points. The respective scores for each centre justified its place in the hierarchy of service centres where Kithimani became the Rural Centre and Matuu the Market Centre and at a lower level.

It thus be seen that since 1970, Kithimani has lost 3 points because of loosing the services of a major road, the Thika-Garissa road; A3, making its total points to 24 which has reduced its connectivity significantly to other centres of importance.

Matuu on the other hand, in the same time period has developed a lot of infrastructural services that have caused an increase in points from 16 in 1970 to 38 in 1985. By using the same point system as was used in

the early 1970's for designation of service centres, Matuu can qualify as an urban centre whilst Kithimani takes on as a Rural centre.

KEY TO POINTS SYSTEMService Centres

1. Administration & Protection
 - a. Administration

Provincial Commissioner	3
District Commissioner	2
District Officer	1
 - b. Justice

High Court	3
Resident Magistrates Court	2
African Court	1
 - c. Police

Provincial Headquarters	3
Divisional Headquarters	2
Police Station/Police Post	1
 - d. Ambulance & Fire Protection

Fire Station	3
Ambulance Service	1
2. Social Services
 - e. Health

Hospital	3
Health Centre	2
Dispensary	1

f.	Education	
	Secondary School	3
	Primary School	2
g.	Library	
	Public Library	2
h.	Social Halls	
	Community Hall/Social Hall	2
3.	Communications & Transportation	
i.	Post & Telecommunication	
	Day & Night Telephone Exchange	2
	Post Office (Departmental)	2
	Postal Agency	1
j.	Automobile Service	
	Auto Service Station	3
	Petrol filling station	2
	Duka Petrol Pump	1
k.	Bus Service	
	over 100 bus trips per day	3
	10-99 bus trips per day	2
	1-9 bus trips per day	1
4.	Commerce	
1.	Over 50 retail shops	3
	5-49 retail shops	2
	1-4 retail shops	1

m.	Open Markets	
	Grade A Market	3
	Grade B Market	2
	Grade C Market	1
n.	Bank Service	
	Full time bank	3
	Part time branch bank	2
	Mobile bank service	1
5.	Communications & Transportation	
o.	Railway service	
	Over 10,00 passengers per year	3
	1,000-9,999 passengers per year	2
	1-999 passengers per year	1
p.	Air Transport	
	International airport	3
	Airport	2
	Airstrip	1
6.	Commerce	
q.	Hotels	
	Residential Hotel	3
	Safari Lodge	1

ANALYSIS AND FINDINGS

CHAPTER 4

4. INTRODUCTION

In this chapter, an attempt is made to verify the basic objective of this study. As such, it will endeavour to highlight those factors which have restricted the growth of Kithimani and significantly affected its performance as a rural centre on the one hand, and establish those that have on the other hand enhanced the rapid and unprecedented growth of Matuu which was originally designated as a market centre for the Yatta furrow area. In this core chapter of the study, it is hoped to indicate which particular centre is favoured by the agricultural and transportation network development in this region and in relation to other significant centres.

The factors listed below will be examined with a view to establishing how they have affected the growth of the two centres (i.e. Kithimani and Matuu) and the consequent inequalities to the farmers in the Yatta canal area which have taken expression in the existing social and economic developments in these centres.

1. PHYSICAL

- a) availability of water
- b) Distance to a market or an input supply centre

2. SOCIO-ECONOMIC

- a) Access to capital

- b) Access to extension
- c) Socio-economic position outside the field of agriculture
- d) Market and Input supply

3. ORGANIZATION

- a) Organization of the farmens in the agricultural schemes

4. TRANSPORTATION

Road networks and traffic volumes which will be evaluated to gauge the accessibility of those centres to others in the region.

4.1. IRRIGATION AND DEVELOPMENT IN YATTA FURROW AREA

4.1.1. HISTORY OF YATTA FURROW

Similar to several other projects in the country, the Yatta canal is connected with Kenya's political history. Although the idea of a canal from the Thika river was mooted as far back as 1936, it was not until 1953, at the height of the MauMau emergency was the plan seriously considered. At that time, thousands of MauMau detainees were held at various parts of the country by the then colonial government and it was under these circumstances that the idea of the canal was quickly transformed into a solid proposal with the following objectives:

- a) In the short term: to provide penal, employment for the Mau Mau detainees
- b) In the long term: to supply water to the Yatta grazing lands and thus permit more rationale grazing

practised in the area.

The canal would also permit irrigation development whose extent was then not determined yet.

The African Land Development (A.L.DEVT.) which was an organization for initiating development activities in the "native" lands was in 1953 instructed to start construction work on the canal utilizing Mau Mau detainee labour. Work continued unabated for four years (until 1958) by which time excavation of the greater part of the canal was completed. However, the emergency regulations had been considerably eased and detainees were being repatriated to their area of origin. As a result, the last sections of the canal were constructed using a combination of employed labour and machinery. After its inauguration, in 1959, the canal was administered by the A.L.Devt. but was soon after taken over by Masaku County Council.

In 1957, due to the county council's lack of sufficient funds and expertise for the proper maintainance of the Yatta canal, the Water Apportionment Board (W.A.B.) transferred the undertaking othe functions of the Yatta Canal to the Ministry of Water Development.

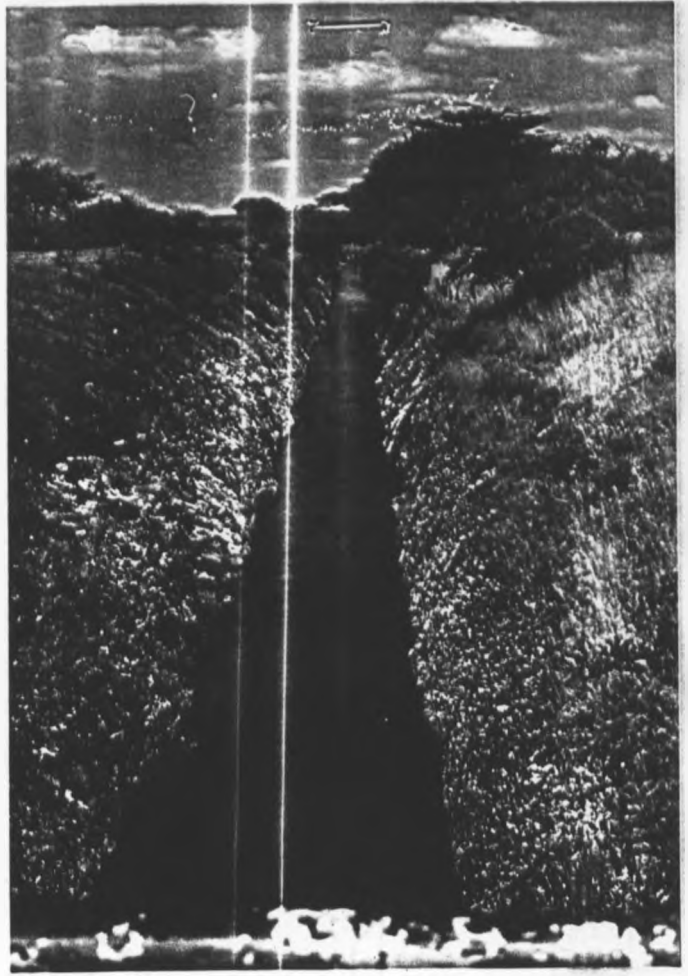
4.1.2. TECHNICAL DATA

The Yatta furrow extends for a length of $37\frac{1}{2}$ miles from the intake at Thika river to the point of entry into the Mwitwa Syano river, with divisions of one mile sections. Kithimani, the Rural Centre the division is located at approximately mile Mark 13 of the Yatta canal whilst Matuu, the Market Centre is located at approximately mile

Plate No. 13 (a)

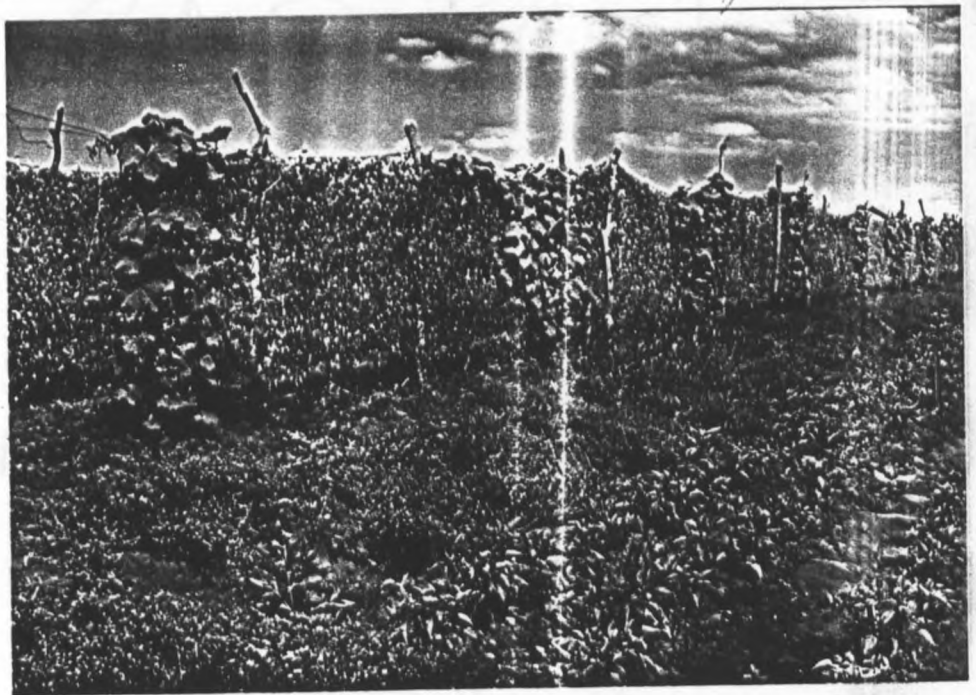


(b)



Above, Yatta furrow or Canal

Plate No. 14



Mixed farming.

30 along the Yatta furrow.

Constructed following the contours of the region, the canal trends from West to East, with a gradient of 0.77 metres per 1,000 metres. The lower bank is at the Northern side of the canal close to Matuu. The main water works intake at present, consists of two broad weirs on the main Thika River into the canal and some canal lining for about 80 metres. The water intake can be regulated. Several flumes were constructed to bridge small valleys especially in the first part of the canal. At several places, cemented overflows exist to avoid water and mud from the high side running into the canal.

The canal has an average width of 1.5 metres and an average depth of 1.6 metres. The main canal ends at Mile mark 31, close to Matuu which is located as aforesaid, at about mile mark 30 of the Yatta furrow. The section between mile mark 31 and 37.5 is referred to as 10 cu.Se's Canal - (10 su.secs = 270 litres/second).

(see plate on the canal)

The water from the Yatta furrow is used for the following purposes:

- a) Domestic use by local population
- b) Livestock in the local area
- c) Irrigation
- d) For Domestic and Livestock water requirements in Kitui District after discharging into the Mwitwa Syano river (the 10 cu.sec.canal)

4.1.3. DOMESTIC USE

14,000 people from the canal area and approximately another 6,000 in the nearby surroundings are wholly dependant on the furrow for their domestic water requirements. It is only Matuu, with a pump at a between mile mark 30 and 31, that has the privilege of piped water. The rest of the population has to fetch water from the main furrow or from the small rivers partly fed by the furrow. (see Map No.). Although Kithimani has been installed with piped water supply, the reliability of this utility is poor due to the frequent breakages of the diesel pump which consequently forces the majority of the residents to fetch water from the furrow or procure it for cash from a private water installation owned by the Matungulu Ranching Company in Kithimani.

4.1.4. LIVESTOCK

In order to water the approximately 30,000 heads of livestock, three water troughs have been constructed between mile mark 19 and 20, 22 and 23 and 27 and 28. This has however, proved insufficient in view of the observation that, much damage is still being caused to the canal banks by livestock at water points other than the troughs mentioned above.

4.1.5. KITUI RURAL AND URBAN WATER SUPPLY

Against the wishes of Ministry's local staff, the water Development headquarters in Nairobi, authorized irrigation along the 10 cu.sec. section of the canal opposed to the initial purposes i.e. Supply Rural and Urban Water Supplies (for domestic use) for Kitui. The outflow which fluctuates at mile mark 37.5 is intended for Kitui and a pumping station has now been installed for this purpose between mile marks 30 and 31.

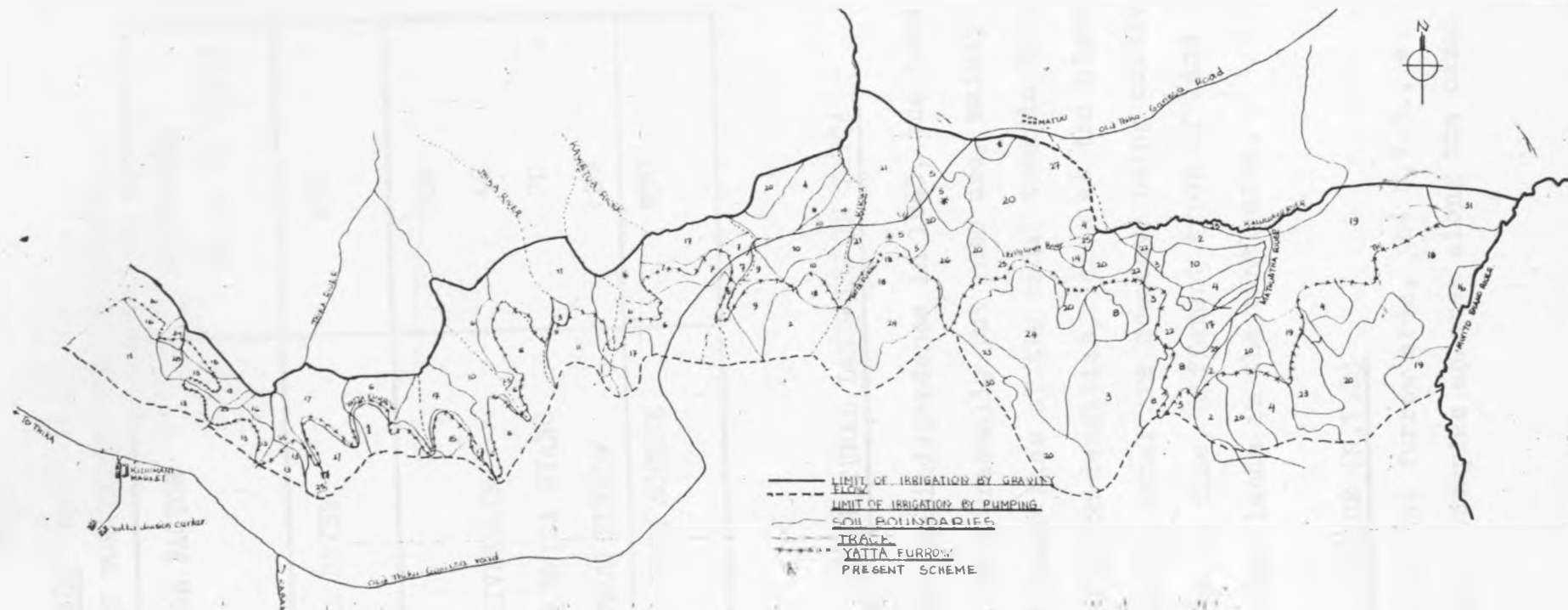
4.1.6. IRRIGATION

Irrigation which is the major water consuming activity (600 litres/second) obtains water from the main furrow by side pipes and syphons activated wither by gravitation or pumps. The most common type of irrigation is furrow irrigation practised by approximately 95% of the farmers who are able to irrigate, the rest (5%) use sprinkler irrigation.

The overall water data according to an investigation conducted by Small Scale Irrigation Units in February 1981 is shown below:-

YATIA IRRIGATION SCHEME SOILS

Map 7



WELL		DRAINED		IMPERFECTLY		DRAINED	
SOIL CHARACTERISTICS	IRRIGATION STATUS	SOIL CHARACTERISTICS	IRRIGATION STATUS	SOIL CHARACTERISTICS	IRRIGATION STATUS	SOIL CHARACTERISTICS	IRRIGATION STATUS
1 VERY DARK BROWN SANDY CLAY LOAM OVERLYING DARK MANGROVE SOIL TO SANDY CLAY TO LIGHT CLAY	SUITABLE	13 DEEP DARK BROWN SANDY CLAY LOAM OVERLYING YELLOWISH RED SANDY CLAY LOAM WITH SUBSOIL LATERITE GRAVEL	SUITABLE	18 DEEP VERY DARK GREY MEDIUM CLAY	MARGINALLY SUITABLE COTTON CAN BE TRIED	28 DEEP VERY DARK GREY BROWN SANDY CLAY LOAM OVERLYING DARK GREY BROWN MEDIUM CLAY WITH SUBSOIL LIMESTONE	UNSUITABLE ALKALINE
2 VERY DARK BROWN MEDIUM SANDY CLAY OVERLYING DARK REDDISH BROWN TO SANDY ALL MEDIUM CLAY	UNFIT	14 SHALLOW DARK BROWN LIGHT CLAY	UNSUITABLE - SHALLOW	19 DEEP SLIGHTLY CALCAREOUS VERY DARK MEDIUM CLAY	UNSUITABLE ALKALINE MARGINALLY SUITABLE RICE CAN BE TRIED	29 DEEP VERY DARK GREY BROWN SANDY LOAM OVERLYING DARK GREY SANDY CLAY LOAM WITH SUBSOIL LIMESTONE	SUITABLE COTTON AND VEGETABLES
3 DEEP VERY DARK BROWN SANDY CLAY OVERLYING DARK GREY SANDY CLAY LOAM WITH SUBSOIL LATERITE GRAVEL	---	15 SHALLOW VERY DARK GREY LOAM OVERLYING DARK BROWN SANDY CLAY LOAM	---	20 DEEP SLIGHTLY CALCAREOUS VERY DARK GREY MEDIUM CLAY	---	30 DEEP BLACK HEAVY CLAY OVERLYING LIMESTONE	UNSUITABLE ALKALINE
4 DEEP DARK BROWN SANDY CLAY OVERLYING DARK BROWN MEDIUM CLAY	---	16 SHALLOW DARK REDDISH BROWN TO YELLOWISH RED SANDY CLAY TO LIGHT CLAY	---	21 DEEP VERY DARK GREY LIGHT TO MEDIUM CLAY WITH SALINE AND ALKALI SUBSOIL	SUITABLE	31 SHALLOW VERY DARK GREY LIGHT CLAY	UNSUITABLE SHALLOW
5 DEEP DARK BROWN LIGHT CLAY OVERLYING DARK REDDISH BROWN MEDIUM CLAY	UNFIT	17 SHALLOW DARK BROWN SANDY CLAY LOAM TO SANDY LOAM OVERLYING DARK RED LIGHT CLAY	---	22 DEEP VERY DARK GREY SANDY CLAY LOAM OVERLYING VERY DARK GREY CLAY LOAM TO LIGHT CLAY	MARGINALLY SUITABLE COTTON CAN BE TRIED		
6 DEEP VERY DARK BROWN SANDY CLAY LOAM OVERLYING DARK BROWN SANDY CLAY TO LIGHT CLAY WITH SUBSOIL LATERITE GRAVEL AND LIMESTONE	---			23 DEEP VERY DARK GREY MEDIUM CLAY WITH SUBSOIL CALCAREOUS CARBONATE CONCRETION	UNSUITABLE ALKALINE		
7 DEEP DARK BROWN SANDY CLAY LOAM OVERLYING DARK REDDISH BROWN TO DARK RED LIGHT CLAY WITH SUBSOIL LATERITE GRAVEL AND LIMESTONE	---			24 DEEP VERY DARK GREY TO BLACK MEDIUM CLAY WITH SUBSOIL CALCAREOUS CARBONATE CONCRETION	MARGINALLY SUITABLE COTTON CAN BE TRIED		
8 DEEP VERY DARK BROWN SANDY CLAY LOAM TO SANDY CLAY OVERLYING VERY DARK BROWN SANDY CLAY TO MEDIUM CLAY WITH SUBSOIL LATERITE GRAVEL	---			25 DEEP VERY DARK GREY SANDY CLAY OVERLYING DARK VERY LIGHT CLAY WITH SUBSOIL CALCIUM CARBONATE CONCRETION	MARGINALLY SUITABLE COTTON CAN BE TRIED		
9 DEEP DARK REDDISH BROWN SANDY CLAY LOAM OVERLYING DARK BROWN SANDY CLAY TO MEDIUM CLAY WITH SUBSOIL LATERITE GRAVEL	---			26 DEEP DARK BROWN SANDY CLAY OVERLYING DARK BROWN SANDY CLAY TO MEDIUM CLAY WITH SUBSOIL LATERITE GRAVEL	MARGINALLY SUITABLE COTTON CAN BE TRIED		

TABLE 10
WATER APPLICANTS FOR YATTA FURROW WATERS:

SOURCE/DISCHARGE FACTOR	LITRE/SEC ON 24 HR BASIS
FLOW FROM THIKA RIVER	830
IRRIGATION	600
DOMESTIC AND LIVESTOCK	40
DISCHARGE INTO MWITA SYANO	70
SEAPAGE LOSS FROM FURROW	120
TOTAL QUANTITY FROM SOURCE	830

4.2. LAND TENURE AND AGRICULTURAL LAND-USE IN YATTA

When Kenya gained its independence in 1963, the lands along the canal were gradually put into use, mainly on the northern lower side of the canal towards Matuu. Due to high population densities, lands at the higher southern side of the canal are nowadays being cultivated; and in the course of time, different types of land users have obtained lands in the canal area.

4.2.1. NATIONAL YOUTH SERVICE (N.Y.S)

A key land user in the furrow area, the N.Y.S., a government agency, occupies an area along the canal

from Mile mark 0 to mile mark 6 with an area of approximately 100 H.a. Established in the area in 1968 the N.Y.S. started irrigation 10 years later in 1978.

The land is meant for training N.Y.S. Service-men in various agricultural skills. Currently the farm has 25 Ha. under coffee, 6 Ha under Mulberry trees for the silk-worm culture, vegetables and food crops comprising mainly of maize and beans. A considerable number of livestock is also reared. Worthy of mention, the N.Y.S. men have been involved in the construction of the A3 class, Thika-Garissa Road.

With all the land being government owned property, the N.Y.S. units agricultural produce is distributed to other units of the service throughout the Republic and for own consumption.

The N.Y.S., purchases 95% of all its farm inputs from Thika in the form of fertilizers, pesticides, seeds etc. The Service has its own highly qualified extension officers in different areas of agriculture. The bulk of the labour force comes in form of N.Y.S. service-men, making the institution almost self-sufficient and as such minimising its interactions socio-economically with Kithimani and Matuu at 7 and 17 miles away respectively.

TABLE 11

NATIONAL YOUTH SERVICE

MILE MARK	DIVERSION POINT	ACTUAL AREA	PARTICIPANTS NUMBER	ABSTRACTION IN LIT/SEC	AREA UNDER IRRIGATION
0-6	---	100.0	6.0	10.0	30.0

4.2.2. MAMBA SETTLEMENT SCHEME

This scheme is part of the Haraka Settlement Schemes which had formerly occupied 27,858 Ha. with a total of 7,767 farms. Partly situated in Machakos and Thika districts, these schemes were founded between 1966 and 1974, mostly on lands of neglected plantations or ranches of former European owners and were meant for farmers without land.

The Mamba Settlement Scheme now consists of 319 farmers with an average farm size of 2 Ha. and occupies an area of 1040 Ha. with 75% of the settlers being from

the Kikuyu ethnic group.

The Mamba Scheme falls under the administration of Ndalani location situated between mile mark 6 and 7 of the canal and about 5 miles from Kithimani and 22 miles from Matuu.

The main activities are rain-dependant subsistence agriculture and the rearing of livestock. The Mamba Settlement Scheme is government owned perpertry.

30* In 1978, Prof. Dr. Ralph Jaetzold conducted a survey on the Haraka Settlement Schemes with regard to the Mamba Settlement Scheme and came up with the following remarks which are important in the framework of this study.

- a) With an average farm-size of 2 Ha. in an area of relatively low rainfall (6-7x100mm) the population density (150-250 People/Km²) is excessive. The farm size should at least be 6 Ha. to provide an economic base of existence and settlement has been suggested to a certain degree by Dr Jaelzold.
- b) Of a total of 319 farms, only 30 (9.4%) are considered good. (see table)
- c) Soil erosion and deterioration in soil fertility is very serious due to deforestation, overgrazing and cultivation.

- d) Communication networks are poor and agricultural extension services very few.
- e) As a result of wrong settlement politics and without sufficient water supplies, the Mamba settlers are listed among the poorest farmers. Their subsistence lifestyle does not help much in the interaction to the nearby centres in terms of markets, input supply, extension work etc.

TABLE 12

MAMBA SETTLEMENT SCHEME

MILE MARK	DIVER- SION POINT	ACTUAL AREA	PARTI- CIPANT NUMBER	ABSTRAC- TION IN LITRE/SEC	AREA UNDER IRRIGA- TION
6-7	06-01	1040	319	18.0	8.0

The Mamba Settlement Scheme also faces a severe water shortage; It is estimated that only 5% of the farmers are able to irrigate whilst the remaining 95% receive no water at all.

TABLE 13

4.2.3. LARGE SCALE PRIVATE FARMS

MILE MARK	DIVER-SION POINT	ACTUAL AREA	PARTI-CIPANT NUMBER	ABSTRAC-TION IN LITRE/SEC	ACTUAL AREA UNDER IRRIGATION
7-9	07-01	50	4	32	30
	07-02				
	09-01				
13-14	13-02				

They are mainly situated between miles 7 and 9 of the canal with a total of 50 Ha. Large scale farmers settled themselves in the area in the early 1970's.

Having water available, the main agricultral activities are cash crop farming (mostly horticultural farming for export). These farms are situated at about 4 miles from Kithimani and 21 miles from Matuu.

With their own transport, these farmens who are of a good socio-economic status sell their products in Nairobi or Thika depending on availability and proximity.

4.2.4. MATUNGULU RANCHING COMPANY

In 1969, 2,000 Ha. were bought from a European farmer by the present proprietor (manager). This included a piece of land 120 Ha. along the Yatta furrow, situated between mile marks 9 and 13.

Shares worth Kshs.500 representing an area of 3.2 Ha. (or 8 acres) were issued. There are now a total of 246 shareholders (the full capacity) all engaged in farming. The farm is situated adjacent to Kithimani and about 17 miles from Matuu.

The key aim of the company was to enhance cattle ranching and the growing of coffee. The company also owns an abandoned sisal plantation near Kithimani. The only important activity engaged in by the company at present is the coffee culture of 15 Ha. situated between mile marks 12 and 13.

In the eventuality of a profit being realized, from the coffee culture, a dividend is paid out to shareholders on a ratio distribution of 10% of the shares a person owns. Losses incurred are also borne by the shareholders when and if they do arise.

The company employs nine permanent workers and 21 casual labourers, mainly concerned with the tending of the coffee culture. The company also owns and operates a water supply point in Kithimani which sells water to

the residents of the surrounding area. They also own a store and an office in Kithimani.

60 of the 246 Share-holders own land at the furrow and practice irrigation for food crop farming, horticulture and Livestock rearing. 76% of the share-holders are involved in rain dependant subsistence farming and livestock rearing.

No credit facilities are extended to the share holders by the Company. Marketing of the farmer's produce, input supplies and organization with regard to irrigation are the farmer's responsibility. The title deeds to the farms land resides with the company and not the farmer.

TABLE 14

MATUNGULU RANCHING COMPANY				ABSTRACTION (INLITRE/SEC)	AREA UNDER IRRIGATION
MILE MARK	DIVERSION POINT	PARTICIPANT NUMBER	ACTUAL AREA		
9 - 13	08 - 03 11 - 01 12 - 01 13 - 01 13 - 03	60	120	54	80
KITHIMANI AREA					

4.2.5 SMALL SCALE FARMERS:

These lands are between mile marks 13 and 37.5 form the bulk of the land area under study which is operated by approximately 1300 small-holders.

Only about 20% of the farmers live on the high or Southern side of the furrew near Kithimani in the aforesaid agricultural holdings.

Land was obtained through the following means.

- (i) Occupation; Due to scarcity of land in areas around Kitui and Kangundo, farmers moved to the Yatta area after Independence in 1963.
- (ii) Settlement; between 1966 and 1976, the ministry of agriculture and Livestock development founded nine of the so called Agricultural Schemes. Within the same period, the Physical Planning Department was designating service Centres. 0.8 Ha. (2 acres) land parcels were allocated to 113 farmers.
- (iii) Buying; Although not quite legal, land is being bought and sold in the region. The buyers are for the greater part people from outside this region who hold moderate to highly paying jobs in government, parastatals, industry and other related occupations. These people normally buy

4.3. AGRO BASED SCHEMES

4.3.1 AGRICULTURAL SCHEMES

TABLE 15

NAME	MILE MARK	DIVERSION PONT	PART NUMBER	ACTUAL AREA	ABSTRACTION IN LIT/SEC.	AREA UNDER IRRIGATION
SITE 20 $\frac{1}{2}$	20 - 21	20 - 01	26	22.4	77.0	14.0
OVERHEAD	26 - 27	26 - 01	11	8.8	6	-
SITE 2	28 - 29	28 - 04	90	7.2	22	4.5
SITE 5	29 - 30	29 - 05	10	8.0	14	5.0
SITE 4	29 - 30	29 - 02	11	8.8	14	5.5
SITE <u>6</u>	29 - 30	29 - 04	11	8.8	22	5.5
SITE 1	29 - 30	29 - 05	10	8.0	4	5.0
OVERHEAD	29 - 30	29 - 06	5	4.0	-	-
SITE 3	30 - 31	30 - 02	8	6.4	3	4.0

As indicated above, the agricultural schemes between mile marks 20 and 30 (near

4.3.2. IRRIGATION SCHEMES:

Where physical conditions allow, the Ministry of water development has connected as many farmers as feasible to a side pipe. It was however, the farmer's task to viably organize themselves upon which they would lodge their request for a side pipe. The Ministry would then determine whether the group of farmers was big enough to warrant a side-pipe or not. In this fashion, some 25 irrigation schemes originated with a participant rate of 3 up to 100 members; where this was impractical, farmers got individual side pipes.

Most schemes have been functioning since the mid 1970's and are located between mile marks 19 and 33 in the same vicinity of agricultural schemes mentioned.

Generally, and especially in the dry season, the water flow in these schemes is insufficient due to;

- (i) Sea page loss through the supply canal
- (ii) Little know-how of the farmers on proper use of irrigation water.
- (iii) Small side - pipes for large groups on some instances.

this land for cash crop farming in the hope of a retirement retreat.

An acre of land with possibilities of irrigation facilities fetches a sum of Kshs 15,000 (Jan. 1985 base year).

The land between mile marks 14 and 37.5 are trust lands whose ownership resides with the Masaku County Council.

The Small holding farmers have the right of occupation but no official rights of disposal. Depending on irrigation possibilities, farm activities range from rain-fed subsistence agriculture to the growing of horticultural produce for export.

TABLE - 16

IRRIGATION SCHEMES WITH 10 OR MORE MEMBERS

NAME	MILE MARK	ABSTR. POINT	PART NUMBER	ACTUAL AREA (H.A.)	ABSTR. (LIT/SEC.)	AREA UNDER IRRIGATION
Kautholini	19 - 20	19 - 02	40	51.8	19	23
Kasai	21 - 22	21 - 03	15	22.0	7	9
Kithendu A	23 - 24	23 - 04	100	(816.0	73	(262
Kithendu B	23 - 24	23 - 05	18	(26	(
Kithendu	24 - 25	-	-	-	-	-
Kumina Kimena	26 - 27	24 - 03	38	34.7	47	12
Muthesya	28 - 29	26 - 03	17	15.9	12	13
Kakumeni	29 - 30	-	-	-	-	-
Watu Project	29 - 30	20 - 04	94	(73.2	24	23
Matuu Farmers	30 - 31	30 - 05	14	(78.7	-	18
Kiaanisyoni	30 - 31	30 - 07	18	(-	-
Misewani	-	-	-	-	-	-
Kaluleni	23 - 33	32 - 03	24	63.4	24	20

4.3.3. INDIVIDUALS AND IRRIGATION SCHEMES WITH LESS THAN 10 MEMBERS.

Of the 1054 farmers with water at their disposal, it is estimated that only some 560 of them are able to irrigate because of the factors mentioned above. It means that only 35% of the 1600 farmers benefit from the existence of the Yatta furrow.

They are mainly commercial farmers in the agricultural and irrigation schemes with less than 10 members and are approximately located at approximately mile mark 17 and 32 near Matuu and further from Kithumani. The actual effective irrigation area is less than 700 Ha. and estimates show that;

- a) the land lying between mile marks 0 and 14, (farmers near Kithimani) under more or less regular irrigation is not more than 60 Ha.
- b) the small holders in area between mile marks 14 and 32 have between 200 - 300 Ha. under more or less regular irrigation and are located in the vicinity of Matuu. Those irrigation and agricultural schemes with less than 10 members also happen to be commercial farmers whose produce is marketed in Matuu market.

Thus, if Kithimani is to benefit from agricultural production in this region, and in regards to marketing, schemes like the Mamba Settlement, Matungulu Ranching Company and Irrigation schemes with a Membership above 10 should be emphasized in future projects

with more stress laid on water supply, water supply systems and the effective use of water.

TABLE 17 - INDIVIDUALS AND IRRIGATION SCHEMES WITH LESS THAN 10 MEMBERS.

MILE MARK	PARTICIPANT NUMBER	ACTUAL AREA (H.A.)	ABSTRACTION (L/SEC.)	AREA UNDER IRRIGATION (H.A.)
14-37½	180	376	748	699.5

b) ENUMERATION FOR ALL SMALL - HOLDERS

PARTICIPANT NUMBER	ACTUAL AREA (H.A.)	ABSTRACTION IN (L/SEC.)	AREA UNDER IRRIGATION (H.A.)
1054	2924.1	748	699.5

4.4. SOCIO - ECONOMIC CHARACTERISTICS:

4.4.1 CREDIT:

In the present situation, possibilities of obtaining credit are fairly limited to farmers as they lack title deeds to the lands they farm. There exists no formal credit organization that can give a loan without a security and as such, it is useless to approach the Kenya Commercial Bank or the Agricultural Finance Corporation; a parastatal organizations which are profound in giving finance to the rural people.

The only formal credit in the area is given by the Masinga Co-operative Society (M.C.S.). The credit extended to members of M.C.S. emanates from the Machakos Integrated Development Program (M.I.D.P.),

to individual Societies in Machakos district who are members of the M.S.C.

This credit helps meet costs for inputs such as seed, fertilizer and other chemicals. Only 10% of farmer in the canal area applied for loans in 1985.

For Commercial farmers who are mostly located in the nearest proximity to Matuu and of whom own shops, hotels and bars in the town, there exists the possibility to obtain loans on behalf of their business property outside the field of agriculture. These loans can be, and are, used for agricultural activities.

4.4.2. EXTENSION

Agricultural extension is institutionalized through the divisional office of the Ministry of Agriculture and Livestock Development. At present it consists of 4 Technical assistants (T.A.) without means of transport and are meant to provide all extension work for 1,600 small - holders in the canal area.

Extension by T.A.'s is given to individuals and groups using the same methods of extension. For extensive and specific extension on agriculture, and animal husbandry, farmers are sent to Farmers training Centres (F.T.C.) in Machakos or Thika for Week - long courses. Only 10% (113) of the farmers in Agricultural Schemes have attended one or more of the F.T.C. courses possibly because they receive

a relatively higher frequency of extension services in agriculture.

Irrigation and drainage extension is conducted by M.O.W. DEVT, though it hardly exists in the practice sense due to limitations in skilled man-power and Transportation.

Commercial farmers in these agricultural and Irrigation Schemes with less than 10 members receive more formal extension work than the rest of the farmers. It was also observed that above schemes receive even more "informal extension".

Table 18 and Table 19, shows the frequency of T.A.'s per year to farmers divided into 2 sections, from mile 14 to mile 25. (note the farmers proximity is close to Kithimani) and the other from mile 26 - 33 (in close proximity to Matuu).

TABLE 18 FREQUENCY OF T.A.'S VISITS PER YEAR: MILE MARK'S 14-25

SOURCE	FEW (<2)	MODERATE (2-6)	REGULAR (>6)
COMMERCIAL	2	-	2(50%) 4
SEMI - COMMERCIAL	16	3(13%)	5(19%) 24
SUBSISTENCE	20	2(9%)	1 (4%) 23
TOTAL	38(75%)	5(10%)	8(15%) 51

TABLE- FREQUENCY OF VISITS CONDUCTED BY T.A.'S PER YEAR:

19 MILE MARK 26 - 33

SOURCE	FEW (2)	MODERATE (2-6)	REGULAR (6)
COMMERCIAL	2(30%)	1(15%)	4(55%) 7
SEMI - COMMERCIAL	5(31%)	4(25%)	7(44%) 16
SUBSISTENCE	9(64%)	2(14%)	3(22%) 14
TOTAL	16(43%)	7(19%)	14(38%) 37

Two conclusions may be drawn from the above tables.

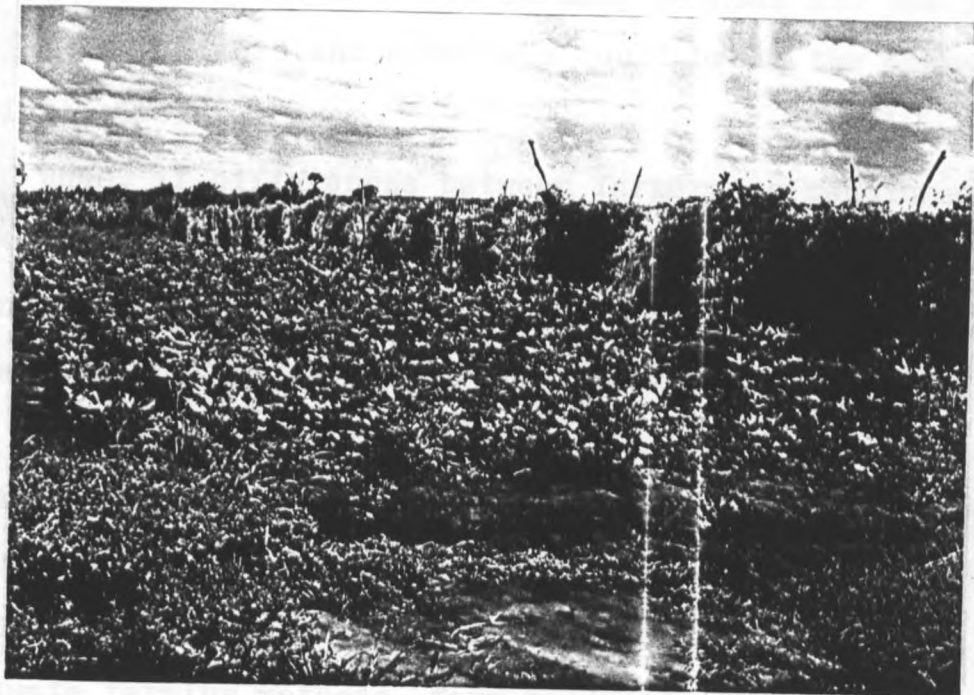
1. The small holders between mile marks 14 and 25 receive considerably less extension work than farmers in the stretch between mile marks 26 - 33 partly causing poor agricultural performance in the area (note that these farms are located near Kithimani). This is due to transportation problems as most T.A.'s live in the Matuu neighbourhood .
2. The Commercial farmers, receive more extension than the semi - commercial farmers who in turn receive more extension than the subsistence farmers. (e.g. those in Mamba Settlement Scheme). It shows a tendency of T.A.'s to bias against farmers who are not so "good".

Apart from insufficient extension in the canal area and the F.T.C. unpopularity among the farmers in the area, there several theoretical objections against extension provision methods. In this, the T.A.'s cannot be solely blamed as they lack vital manpower, equipment, and transportation thence having difficulties



CHILLIES

Small - Scale horticultural farming near
Matuu.



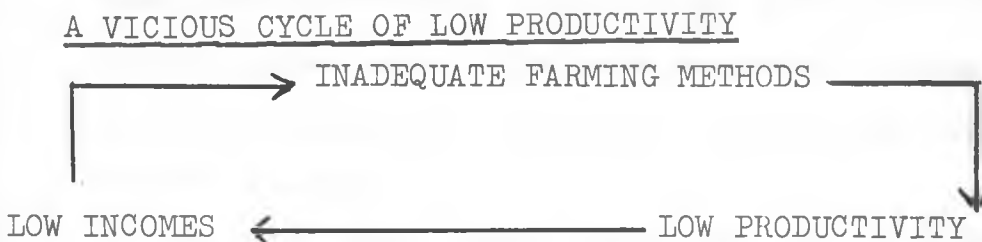
MIXED FARMING

in communicating ideas due to low schooling standards of the farmers.

Extension therefore, seems the most appropriate tool to solve atleast one bottleneck of rural development. When inadequate farming methods are the cause of a low production causes low incomes and this on its own term causes inadequate farming methods.

(see the figure below).

FIGURE .20



The introduction of new farming methods and the use of fertilizers and chemicals could break the above vicious circle.

Thus, if differences between farmers as mentioned above are not taken into account with giving extension on new farming methods, use of fertilizers and chemicals, extension will have an inverted effect for the most of the farmers in the canal area.

Because the more rich farmers can innovate more quickly, they will benefit the most from extension services. It will give them an even bigger lead on the field of adequate farming methods, farm productivity and marketing through which the inequality between the commercial and subsistence farmers on the other will enlarge.

4.3 SOCIO - ECONOMIC POSITION OUT-SIDE THE FIELD OF
AGRICULTURE

31 * The following divisions of progressiveness can be made and have direct implication to the Centres in terms of investments and services that eventually demand for even more service oriented utilities.

1. HIGHLY INNOVATIVE PEOPLE:

A small group of people who "are rich enough to risk the new venture, while their position in the social system makes them less subjected to the forces of tradition and social control that works against change.

In the canal area, people who come from "outside" ie. those that come from moderate to highly paying jobs in government, parastatals or industry to engage in farming in the area, comprising of teachers, police officers, managers, clerks, etc can be listed in this group. 80% of this group of people are the owners of the agricultural holdings in Matuu area and own enterprises which in their nature create a feasible demand for the supply of services. i.e. telephones, electricity, banking, postal services, good roads etc and thus the culmination of high levels of infrastructural facilities in Matuu Centre.

2. NOTABLES

This comprises of a group of people "with a high socio - economic status and leadership who cannot risk their position in the community by innovating unless it seems beneficial to do so"

Also as much as 90% of this group of farmers in the canal area are those who own shops, bars, hotels, Matatus and have high socio-economic status and leadership position in Matuu.

3. LESS PROGRESSIVE PEOPLE AND LEGGARDS

The mass of farmers who, owing to lack of knowledge and Capital and who are subject to forces of tradition and social control against change.

These group of people are mainly farmers operating near the Kithimani area .i.e Mamba Settlement scheme, Matungulu Settlement Scheme and a big proportion of small-holder farmers. These farmers are young and have not had secondary education and to the leggards who aren't able to irrigate and hence are dependent on rain fed agriculture.

So a more progressive farmer(group 1 and 2), compared with the less progressive farmer and leggards can be described as "richer", more educated, have more leadership positions and have more contact with the world outside their social system through mass media, travel and extension workers. This group of farmers are the owners of enterprises in Matuu and have farms in the most organized schemes as will be seen later in the study and have powerful positions outside the field of agriculture. This aspect has given them an incontestable incentive for further improvements of the physical infrastructures in Matuu area unlike in Kithimani.

Then because the more rich farmers can innovate

more quickly, they will benefit the most of extension. It will give them an even bigger lead on the field of adequate farming methods, farm productivity and marketing through which the inequality between the Commercial farmers on one hand and the semi-commercial and subsistence farmers on the other only will enlarge.

Extension, then breaks the vicious circle mentioned earlier but creates new conditions by which this vicious circle will be preserved for the mass of the farmers.

4.4.4 MARKETING AND INPUT SUPPLY

LOCAL MARKET

The most important market in the area is Matuu market which is of local and regional importance. It is held twice a week on Wednesdays and Saturdays.

The market is free, open and competitive and hence highly sensitive to fluctuations in demand and supply with corresponding changes in prices and price levels.

A small fee is charged to sellers in the open - air market benefiting the Matuu centre, whilst a slightly higher fee is charged for those selling their wares in the roofed section situated in the centre of the market. This market is built of stone structure walls with asbestos roofing .

The bulk of traders in the market include wholesalers and retailers whereas a certain proportion act as middle-men of the produce between Kitui and Nairobi preferring to buy their agricultural produce at Matuu

Plate No. 17



Plate No. 18

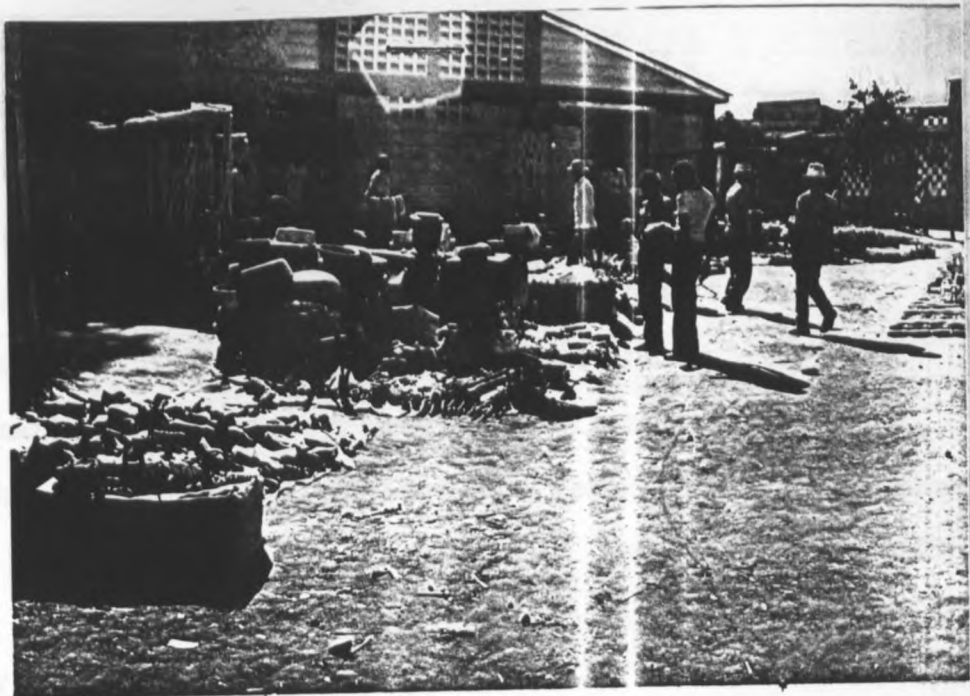
MATUU MARKET



115 -

Plate No.

19



ABOVE MATUU MARKET

Plate No.

20



COLLECTION OF HORTICULTURAL PRODUCE
FOR EXPORT.

than Kithimani (The middlemen are usually people from the canal area) . The fact that in most cases the wholesale prices for tomatoes, onions, cabbage and bananas are higher than the retail prices at Matuu Market is, apart from a better quality at the wholesale market an indication that the local market for these products is already saturated and that the supply is higher than the demand with corresponding changes in price levels. The sellers of commodities are 90% women.

EXPORT MARKET

This market is dominated by asian firms from Nairobi notable of whom are Kenya Horticultural Exporters (K.H.E.) The farmers on making initial contact with the firm (s) has his produce collected from his farm or collecting points in Matuu atleast twice a week. (Presumably dependants on the size of his consignment (s)).

Approximatly 10% of the farmers along the canal grow products for this market most of whom comprise the commercial farming community making Matuu Centre the major beneficiary as a collecting centre for this produce.

INPUT SUPPLY

For seeds, fertilizers, and related supplies, three sources are distinguishable.

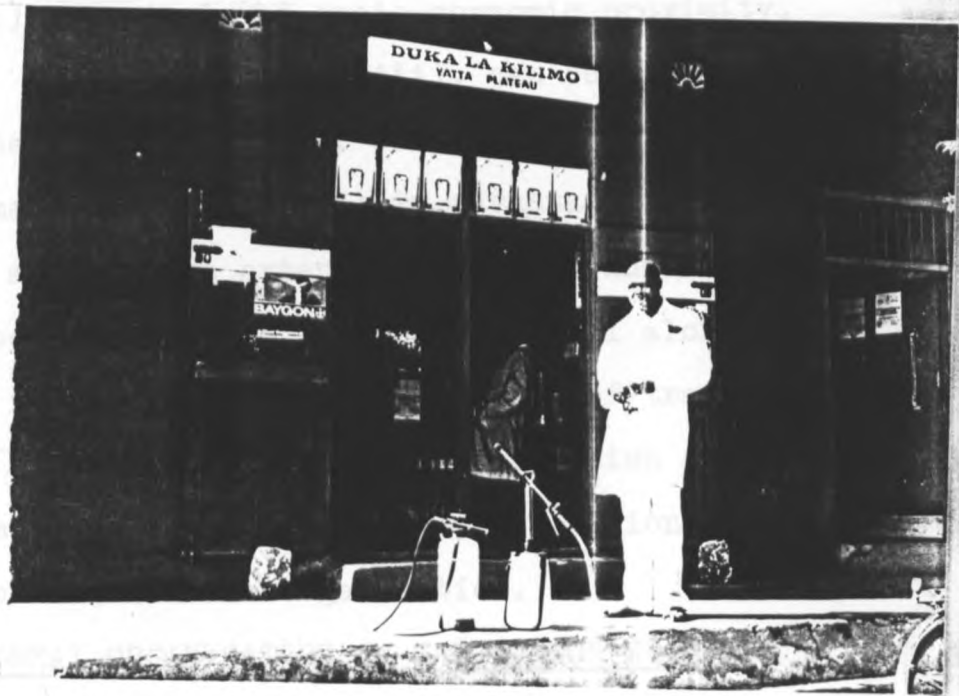
1. Masinga Cooperative Society in Matuu.
2. Local Shops in Matuu.
3. Regions outside the canal area i.e Thika and Nairobi.

In the foregoing, it is clear that Matuu comes sharply in favour as the main local centre for the provision of input

(a)



Matuu's input supplies Centre for fertilizers, pesticides, Seeds etc.



supplies unlike Kithimani.

4.4.5 ORGANIZATION OF FARMERS

Partially due to cultural inheritance, cooperation among the farmers along the canal is wide - spread and forms an important aspect of the lifestyles. The levels of organizations are suitable solutions to different levels of economic and physical strains which plague the farmers.

The criteria which has been used in this study and has bearing to all concerted actions in the area are:-

- (i) Existing schemes i.e availability of water.
- (ii) Family ties.
- (iii) Physical and socio-economic proximity.

The third factor (iii), can be highly influenced in developments if for example the well organized farmers have accessibility advantage to a market centre and appropriate extension services and input supplies. Since most farmers are scattered all along the canal and in most cases lack possession of transport, distance of even 10 Km. can be a limitation for organization. Thus, different socio-economic positions create varying opportunities for organization.

4.4.6 A FORMAL ORGANIZATION IN IRRIGATION GROUPS

Irrigation groups in the area are registered with the Ministry of Water Development and comprise of irrigation schemes, agricultural schemes, the Mamba Settlement Scheme and Farmers of the Matungulu Ranching Company.

This includes some 55% of all farmers in the canal area and 85% of the farmers connected to a side pipe.

The groups were formed with an aim to supply and maintain water supply among the members of the group. To discharge the following tasks, it was found necessary to create an organizational structure.

- (i) To maintain the supply canals within each scheme.
- (ii) Allocation of water by drafting of duties.
- (iii) Conflict resolution.

This required a set of rules, sanctions and an institution which would execute sanctions and settle problems which were to be observed and recognized by all members empowered to do so.

Despite the fact that technically spoken farmers still don't know how to use irrigation water properly, on the organizational level, they have established in an average period of 5 years (1981 - 86), a structure which is fully incorporated in their social system and has linkages as an institution with other structures concerted actions outside water-supply and through role embeddedness with traditional structures and power positions in the local social system.

The level of organization and the functioning of different groups however is not the same and seemed to depend on:-

- (a) time a group has been existing
- (b) size of the group.
- (c) availability of sufficient water.

(d) leadership.

(e) Socio-economical and Cultural homogeneity of the group.

In general, one can say that smaller groups, which have existed long and have sufficient water, a strong leadership or executive committee and a great homogeneity are best organized with regards to the schemes welfare in terms of productivity and social coherency.

The amount of water available is crucial for the function-
in of these groups.

Except for the Agricultural Schemes and the 60 shareholders of Matungulu Ranching Company (out of 248 shareholders) have sufficient water, The rest of the irrigation groups face a shortage of water, whereby they try as honestly as possible to divide the water among their members.

In scarcity of water supply, such that effective irrigation is not possible anymore for all the members, the group falls apart and a few farmers, normally at the beginning of a supply canal seizes all the water.

An example of this are the irrigation groups within the Mamba Settlement Schemes.

The waterflow here is far below the limit where effective irrigation is possible. Hence irrigation groups are not functioning, the supply canal is not cleaned and only a few farmers at the beginning of the scheme obtain all the water and as such the agricultural productivity is very low.

The different irrigation groups can be divided according to their ability to organize themselves using the follow-

ing characteristics which were found reasonable for the study.

- (i) frequency of cleaning of (a) supply canal (s)
- (ii) frequency of meetings.
- (iii) lining of the supply canal (s)
- (iv) Cooperation outside the field of the watersupply.

A. Reasonaly Organized Farmers

FIGURE 210

Name:	Mile Mark	Participant Number
Agricultural schemes	19 - 33	113
Kautholine	19 - 20	40
Kasai	21 - 22	15
Kithendu A	23 - 24	100
Kithendu B	23 - 24	18
Kithendu Kumina Kimena	24 - 25	38
Kaluleni	32 - 33	24

B. MODERATELY ORGANIZED Farmers

FIGURE 221

Name:	Mile mark	Participants Number
Muthesya	26 - 27	17
Matuu farmers	30 - 31	14

C. Poorly Organized Farmers

FIGURE 23

Name	Mile mark	Participants number
Mamba Settlement Scheme	6 - 7	319
Matungulu Ranching Co.	9 -13	60
Kakumeni Water Project	28 -29	94
Kiaansiyoni Misewani	30 - 31	18

more services and infrastructural inputs to facilitate this thriving and profitable agricultural commercial undertaking.

According to the proceeding enumerations of the following figure, it is evident once again that farmers within the vicinity of Matuu are more organized than those in the vicinity of Kithimani which are poorly organized. The fact that those farmers near Matuu are the most organized, and their promimity to the market Centre advantageous for local and export market has a lot of positive implications for the authorities to provide this centre with.

4.5. TRANSPORTATION

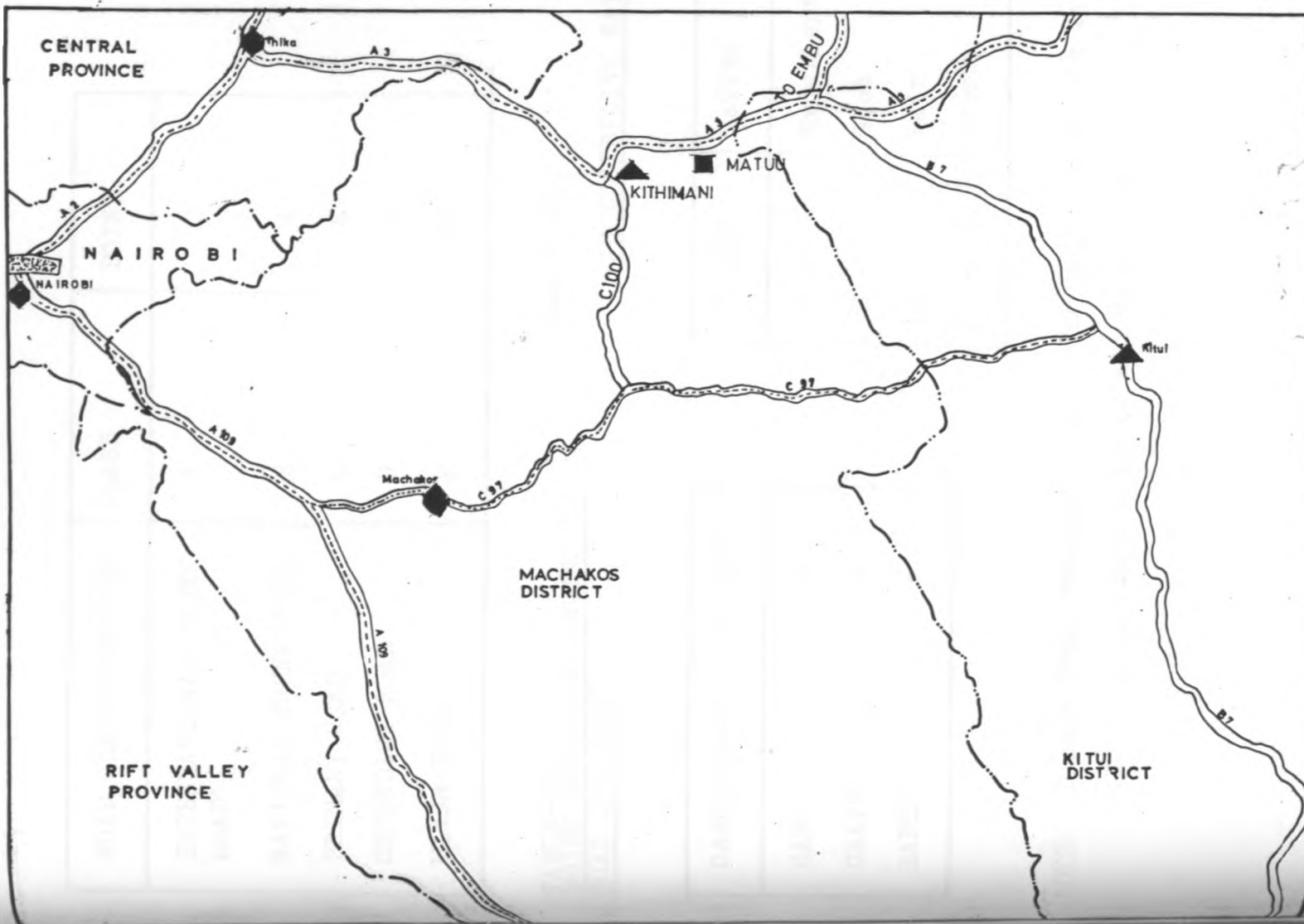
4.5.1 INTRODUCTION

The study in this sub-section of the chapter will embark in measuring the accessibility of Kithimani and Matuu to other important towns in the region as indicated in Map No. 8 . With increased accessibility to various significant centres in the region, a centre

direct benefits in the resulting high turn-overs in trade thus increasing incomes. Also, the increased information flow due to intensified interactions greatly improves people general awareness which is an inevitable aspect necessary for a positive social innovation in a Centre within the process of urban development. At the end of this section, the study will briefly examine any possible transformations that may have occurred in the road systems in the Yatta area that may have reduced or increased accessibility of either Matuu or Kithimani. The centres in the region upon which the accessibility measure will be undertaken are Thika, Embu, and Kitui in the norther part and Nairobi and Machakos on the Southern part of Yatta area where these centres are located.

4.5.2. ACCESSIBILITY

The measuring technique used here is the index of Population Potential based upon the gravity model. In this model, a centres accessibility is seen to be a function of proximity which will be measured here in terms of the points a centre scores through the following categories which the study found most appropriate to use. Also, a point system has been improvised according to a combination of the functional importance of the road linkages and the quality of the carriageways.



MACHAKOS DISTRICT
ROAD NETWORK FOR B7, A3, A2, A109, C97, C

- ROAD CLASS**
- A INTERNATIONAL TRUNK ROAD
 - B NATIONAL TRUNK ROAD
 - C PRIMARY ROAD
 - D SECONDARY ROAD

- KEY**
- A2 NAIROBI - THIKA ROAD
 - A3 THIKA - GARISSA ROAD
 - A109 NAIROBI - MOMBASA ROAD
 - B7 MACHAKOS - KITUI
 - C97 MACHAKOS - KITUI
 - C100

- DISTRICT BOUNDARY
- - - PROVINCIAL BOUNDARY
- ◆ URBAN CENTERS
- ▲ RURAL CENTER
- MARKET CENTER
- LOCAL CENTER
- HARD SURFACE ROAD
- EARTH SURFACE

Map



NAME: KARIUKI J.N.
CANDIDATE: M.A. PLANNING
DEPARTMENT: URBAN REGIONAL PLANNING
SCALE: 1:500,000

TABLE - POINT SYSTEM ACCORDING TO ROAD CLASSIFICATION

24

ROAD CLASSIFICATION	CLASS	POINTS
INTERNATIONAL TRUNK ROAD	A	2
NATIONAL TRUNK ROAD	B	4
PRIMARY ROAD	C	6
SECONDARY ROAD	D	8
MINOR ROAD	E	10

TABLE- 25
POINT SYSTEM ACCORDING TO
ROAD QUALITY

Table 26

ACCESSIBILITY RATING

CARRIAGEWAY	POINTS
HARD	2
GRAVEL	4
EARTH	6

POINTS	RATING
2 - 6	Excellent
8 -12	Good
14 -18	Fair
20 -22	Poor

NOTE: Please note that the higher the points a centre scores the less accessible it is and vice versa.

TABLE 27: ACCESSIBILITY MEASURE FOR KITHIMANI TO OTHER CENTRES
 (i) THIKA

ROAD QUALITY	POINTS	ROAD CLASSIFICATION	POINTS
Gravel (C100)	4	C 100	6
Hard (A3)	2	A 3	2
TOTAL POINTS	14		
(ii) <u>EMBU (via Matuu)</u>			
Gravel (C100)	4	C 100	6
Hard (A3)	2	A 3	2
Gravel (B7)	4	B 7	4
TOTAL POINTS	22		
(iii) <u>KITUI (via Matuu)</u>			
Gravel (C100)	4	C 100	6
Hard (A3)	2	A 3	2
Gravel (B7)	4	B 7	4
TOTAL POINTS	22		
(iv) <u>NAIROBI (via Thika)</u>			
Gravel (C100)	4	C 100	6
Hard (A3, A2)	2	A (A3,A2)	2
TOTAL POINTS	14		
(v) <u>MACHAKOS (via Kabaa)</u>			

Gravel (C100)	4	C (C100, C97)	6
Hard (C97)	2	-	-
TOTAL POINTS	12		
(vi) <u>MACHAKOS (via Nairobi)</u>			
Gravel (C 100)	4	C (C100)	6
Hard (A3,A2)	2	A (A3,A2)	2
TOTAL POINTS	14		

TABLE 28: ACCESSIBILITY MEASURE FOR MATUU TO OTHER CENTRES

(i) THIKA

ROAD QUALITY	POINTS	ROAD CLASSIFICATION	POINTS
Hard (A3)	2	A (3)	2
TOTAL POINTS	4		
(ii) EMBU			
Hard (A3)	2	A (3)	2
Gravel (B7)	4	B (7)	4
TOTAL Points	12		
(iii) KITUI			
Hard (A3)	2	A (3)	2
Gravel (B7)	4	B (7)	4
TOTAL POINTS	12		
(iv) NAIROBI			
Hard (A3, A2)	2	A (2,3)	2
TOTAL POINTS	4		
(v) MACHAKOS (via Kahaa)			
Hard (A3)	2	A (3)	2
Gravel (C100)	4	C (100,97)	6
Hard (C97)	2		
TOTAL POINTS	16		

(vi) MACHAKOS (via NAIROBI)

Hard (A ₁ , A ₂ , (97)	2	A (3,2)	2
-		C (97)	6
TOTAL POINTS			10

A summary of the scores is presented in the following table which is meant to show the comparative accessibility of Kithimani and Matuu.

TABLE 29: SUMMARY OF ACCESSIBILITY STATUS OF KITHIMANI AND MATUU

FROM KITHIMANI TO	POINTS	FROM MATUU TO	POINTS
1. Thika	14	Thika	14
2. Embu (via Matuu)	22	Embu	12
3. Kitui (via Matuu)	22	Kitui	12
4. Nairobi (via Thika)	14	Nairobi (via Thika)	4
5. Machakos (via Kabaa)	12	Machakos (via Kabaa)	16
6. Machakos (via Nairobi)	14	Machakos (via Nairobi)	10
TOTAL SCORE FOR KITHI-MANI	98	MATUU	58

According to the above summary table of accessibility situation of Kithimani and Matuu and the 5 centres named above, several things can be concluded. Generally, and as indicated in the total scores, Matuu has a relatively better accessibility than Kithimani to the towns as indicated.

Specifically, Matuu has excellent accessibility status to Thika and Nairobi, Good access to Machakos (via Nairobi), Embu and Kitui and a fair access to Machakos via the Kabaa route.

Comparatively, Kithimani has no excellent accessibility to neither of the centres. However, it has a good access to Machakos via the Kabaa route and greatly benefits from that aspect because of the frequent need of interactions between the divisional headquarters and the district headquarters in Machakos. A fair accessibility situation occurs for Thika, Nairobi, Machakos via the Nairobi route from Kithimani. Poor accessibility to Embu and Kitui from Kithimani dictates the low level of interactions between them.

Certain transportation planning decisions may have been responsible for the current accessibility situation that has already been discussed. After going through the Ministry of Transport's road draft development plan for 1969/74, several transportation projects envisaged in the plan have already been implemented. Some of them have been indentified as the causal factors which have laid their expressions in the current relative accessibility status of Kithimani and Matuu.

Out of a financial ceiling of £1,000,000 using 1969 base year, a major construction of the Thika - Garissa road was to be implemented within the plan period. This road, which by classification is an International trunk road, was implemented with major realignments in some sections in order to conform with the regions contour- lines so as to reduce the cost of construction. In particular, a major realignment occurred at Kithimani which neccessited the road design to by - pass

the centre by about one Kilometre. As such, Kithimani remained to be served by the Old Thika - Garissa road which is of a less functional importance than the latter and is of major regional and international importance in regards to the flow of goods and services and was bituminized till a few Kilometres after Matuu. Previously the Old Thika Garissa road had by-passed Matuu to its southern edge. However, the New Thika Garissa road's position in Matuu is such that it is strategically located and developments have spontaneously taken up on both sides of the road. Matuu has ever since become a major focal point where truck drivers stop over-night and public transporters find it to be a central location with good accessibility to other areas that highly interact with Matuu. A very important road project in the area was the improvement of the road to Embu and Machakos to Kitui. These transport transformations in the road networks in the Eastern province region can be interpreted in the historical traffic volume of the Thika - Garissa Road, A 3 which reflect a significant change in traffic volume. In particular, Matuu has gained alot of traffic since the completion of the Thika Garissa road up to its present location. This road and as mentioned earlier was asphalted passed Matuu in 1981. Little and insignificant change in the traffic volume has been felt in Kithimani. The little increase in traffic can be associated by the increase of interactions between the Administrative centre and the district headquarters in Machakos. We must also note that Kithimani has a good accessibility to Machakos than Matuu as indicated by the finding of the accessibility measure.

The following tables are showing traffic volume are able to demonstrate these changes accordingly.

The averages of the traffic volume for the years 1972 to 1974 are supposed to demonstrate the traffic flow situation before the realignments in the Thika-Garissa road, A3, whilst the averages of traffic volume for 1980 to 1982 are supposed to show the magnitude of traffic flow after the road realignments uptil Matuu.

TABLE 26 TRAFFIC VOLUME BEFORE REALIGNMENT (1970-1972)
AT EAST OF MATUU. POINT A3/17

(a)

YEAR	CARS	LIGHT GOODS	MEDTUM GOODS	HEAVY GOODS	BUSES	TOTAL	AVER* AGE	
1970	5	7	7	-	1	20		
1972	84	79	62	9	101	335		
(b) TRAFFIC VOLUME AFTER REALIGNMENT (1980-1982)						TOTAL	355	178
1980	30	150	18	6	7	211		
1982	37	195	105	34	26	397		
						TOTAL	608	304

Percentage increase
159%

TABLE 27 TRAFFIC VOLUME BEFORE REALIGNMENT AT N.W OF KITHIMANI POINT A3/19 (1970 - 1972)

(a)

YEAR	CARS	LIGHT GOODS	MEDIUM GOODS	HEAVY GOODS	BUSES	TOTAL	AVER- AGE
1970	9	14	9	-	6	38	
1972	78	77	57	8	109	329	
TOTAL,						367	184

(b) TRAFFIC VOLUME AFTER REALIGNMENT (1980-1982)

YEAR	CARS	LIGHT GOODS	MEDIUM GOODS	HEAVY GOODS	BUSES	TOTAL	AVER- AGE
1980	33	166	23	6	7	235	
1982	37	167	103	33	29	369	
TOTAL						604	302

Percentage increase 64%

Through the evaluation of the historical traffic volume that passed through these centres before and after road realignments on Thika-Garissa road, it can be clearly seen that vehicles passing by Matuu increased from 178 to 304 which is 159% increase of traffic volume between 1970 - 1972 and 1980 - 1982 when also the Thika-Garissa road was asphalted up to Matuu.

Results from table ^{27 a & b} shows that traffic volume passing through Kithimani between 1970 - 1972 to 1980 - 1982 had only a moderate increase of 64% as compared to that in

Matuu which was 159%.

Therefore, we can deduce that there has been increased interactions in Matuu through goods and services made available by the increased traffic volumes than in Kithimani. Kithimani's little growth in traffic volume can be largely associated with increased government interactions between it and the district headquarters in Machakos town.

MAJOR FINDINGS AND RECOMMENDATIONS

CHAPTER 5

5.0 FINDINGS

The study has been able to show that selection and designation of towns as service centres on the basis of the existence of certain types of infrastructure as indices of growth may not essentially result in their development as effective service centres where growth functions are meant to emanate.

Results show that despite the designation of Kithimani as a Rural centre on the basis of the number of infrastructures centrally located during the time of designation, little development has taken place in the centre. Comparably, Matuu which was designated as a market centre because of low levels of infrastructure and its position within the region has in fact grown rapidly and is of significant regional importance.

The factors which have worked against the development of Kithimani as a Rural centre can be summarised as follows:- First, the centre's relative location in terms of its accessibility to major centres of vital economic and social importance is poor. This implies that the centre's selection was piecemeal in that it was selected with little reference to other important centres in the region except for Machakos. Therefore over the years, activities which might have been located in

Kithimani have been attracted to other towns nearby and specifically to Matuu. Matuu has been able to generate its own growth even after Kithimani's designation as a Rural Centre.

Secondly, channels like the road networks, through which innovations move from the major urban centres (like Thika, Machakos, Kitui and Embu in our case), into the smaller centres and into the hinterlands of such centres have been grossly interfered with by the construction and development of new road networks in the region. These developments on Thika-Garissa road have inturn reduced the interaction between Kithimani and its hinterland. On the other hand, the above transportation developments have indeed improved the accessibility of Matuu through increased accessibility to other important centres named above.

The study has shown that the flow, in terms of transportation volume has gone up considerably in Matuu whereas transportation increase has only gone up moderately in Kithimani due to the major, by-pass. Transportation flow in these centres suggest either increased socio-economic interactions or the decrease of the same.

Thirdly, the results from the agricultural developments in the Yatta furrow area, show that the most productive and organised agricultural schemes are located much nearer

to Matuu than Kithimani. As such, agricultural produce which also includes horticultural products for export is found conducive to be marketed in Matuu which it is also the most suitable centrally located place most ideal as a collection centre for agricultural products destined to other markets in Kenya and overseas.

Lastly, the historical development of Kithimani was not spontaneous and hence it was not in response to the local needs. This has had implications on the development of the centre and its linkage with the hinterland. This sort of symbiotic relationship between a centre and its hinterland is well demonstrated by Matuu centre. The centre evolved as a traditional open air market and hence in response to the local peoples needs. Various transportation developments in the region have also greatly enhanced its growth especially in the field of commercial functions where Matuu has outdone Kithimani, in respect to the growth of commercial activities.

The comparison between Kithimani and Matuu is important in that it shows that centres which have evolved from traditional open-air markets are good indicators that show not only the potential for growth of a centre but also its relative importance as a centre of high social interaction and importance. As social attraction points, openair market centres offer good opportunities for change agents to interact with people from the hinterland and in the process transmit ideas which may contribute to changed

attitudes and adoption of innovations. It is also highly suggested, on the other hand, that centres that have taken their urban development orientation from colonial administration onset, have failed to fulfil the needs of the local people in terms of goods and services because of their positions which are ill-located in respect to the local population. However, their locations appear to be strategic for other reasons; other than those that would benefit the people. i.e. relative to other administrative centres in the district, the location of Kithimani is strategically located e.g Machakos.

The study has also noted that members of the important clans who are rich farmers and hold power positions in public function and who live near Matuu may have influenced certain decisions in the planning and location of certain infra-structural utilities.

Two important aspects can be said in this study. First, that if growth centres are to be used as points from which development impulses can be disseminated, more weight should be given to their relative social attraction of a place as marked by the presence of traditional open air markets that have evolved through local micro-economics of agricultural marketing. This consideration should be foremost in the selection of growth centres. However, it does not seem that this critical consideration was taken into account when Kithimani was designated as Rural service centre making it fall short in its intended rules.

Secondly, the implications of local developments in the region as in agriculture and transportations on urban development appear not to have been well understood among the planning authorities. With increased coordination among the planning bodies, the less the chances of defeating one another's objectives. Prior knowledge of future proposed developments may have indicated the nature and intensity of land-use at a particular location at a certain plan period. Therefore, the integration of regional development plans must be enhanced towards a determined National objective as it were in the designation of service centres which does not appear to have been the case in the developments that took place in Yatta furrow region.

5.1 IMPLICATIONS OF THE STUDY

5.1.1 NATIONAL SIGNIFICANCE

The study has shown that in designating growth centres, instead of weighing heavily on the criteria of the presence of certain levels of centrally located infrastructure which may not be directly used by local investors, increased weight should be given to the following parameters:-

1. Existence of resources in the hinterland capable of supporting the type of development envisaged. This should be evidenced by high agricultural productivity which is the mainstay of the majority of Kenyans.

2. An understanding of how a centre has evolved over a time or the historical development is important. Because the past and present are good indices not only of the potential growth of a centre but also the symbiotic linkages that exist between the centre and its hinterland.

3. Selection of specific towns or centres should be considered within the framework of a national/regional/sub-regional, urban development strategy.

4. A centre's attractiveness to investors depends on the presence of infrastructure related to the type of investments that they consider viable.

5. Policy consistency is important in strengthening centres selected for growth.

5.1.2 REGIONAL SIGNIFICANCE

As earlier noted, in the designation of Kithimani as a Rural service centre, the town was considered more or less independently of other centres within the region. the existence of other urban centres within the region has caused fierce competition in attracting location of activities between centres. In this competition, the established centres i.e Matuu, Kitue etc, have attracted lucrative commercial activities more readily

than those designated without the requisite infrastructure and consistent policies especially in respect to the development of regional road network. This study does also show that designation of centres as Growth centres must remain flexible to take advantage and to respond to new development trends.

5.2 RECOMMENDATIONS

In order to enhance and strengthen the growth of Kithimani and its linkages with the hinterland, it is important to extend agricultural produce collection functions to it. So far, it is only maize produce which has just began moving towards this direction with the recent completion of the Maize and Produce Board depot.

The decentralisation of some of the functions in Matuu to Kithimani and the development of services functions at Kithimani related to the economy of the region can foster the growth and enhance the linkage of Kithimani with the hinterland. These could be achieved through establishing enterprises for input and market supplies for farmers in the region. And also, establishing of a commercial Bank and to this effect, Kenya Commercial Bank can see to its implementation.

The accessibility of Kithimani to other centres can be improved by the up-grading of minor road, E,468 to an all weather road of a primary function. This road can greatly improve

the accessibility of Kithimani to Kitui and Embu. Also with improvement of primary road C100 serving Kithimani to Machakos via Kabaa into an all weather road can also significantly improve its status in terms of increased accessibility at the regional level of interaction.

Also, in order to intercept most of the by-pass traffic passing through Thika-Garissa Road, commercial plots can be allocated further up at the junction.

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HOUSEHOLD - QUESTIONNAIRE

CITY OF NAIROBI
DEPARTMENT OF URBAN-REGIONAL PLANNING

- (1) NAME OF INTERVIEWER
- (11) DATE OF INTERVIEW
1. NAME OF HOUSEHOLD HEAD AND AGE & SEX .
2. NUMBER OF PERSONS IN THE HOUSEHOLD:
3. DISTANCE OF HOUSEHOLD FROM (a) KITHIMANI.....MILES
(b) MATUU.....MILES
4. NAME OF THE SCHEME AND ACERAGE OF HOLDING.
5. INAUGURATION OF THE SCHEME 19.....
6. WHERE WERE YOU BORN (FOR HOUSEHOLD HEAD AND WIFE/S)?
- 6.1 IF BORN OUTSIDE THE STUDY AREA, REASON FOR MIGRATION.
(a) HUSBAND (b) WIFE 1/2/etc.

7.0 EDUCATION

7. LEVEL OF EDUCATION OF HOUSEHOLD HEAD AND WIFE/S.
- 7.1 LEVEL OF EDUCATION OF THE ABOVE'S CHILDREN & DEPENDANTS & THEIR AGES & SEX
- 7.2 HAVE YOU ATTENDED ANY AGRICULTURAL COURSE I.E. THE THIKA HORTICULTURAL RESEARCH STATION?
- 7.3 WHICH IS YOUR MAIN SOURCES OF AGRICULTURAL INFORMATION?
(a) TECHNICAL OR FIELD OFFICERS
(b) NEIGHBORING FARMERS
(c) MARKETING AGENCIES
(d) AREA D.C./D.O./CHIEF/ASST.CHIEF
(e) WRITTEN MATERIAL & LITERATURE
- 7.4 NUMBER OF VISITS OF FIELD OFFICERS AND TECHNICAL OFFICERS PER SEASON.
(a) ONE.....(b) TWO.....(c) THREE.....(d) FOUR.....
-SPECIFY
- 7.5 WHAT IS THE NATURE AND CHARACTERISTIC OF YOUR FARMING?
(a) AGRICULTURAL/COMMERCIAL (b) SUBSISTENCE/DOMESTIC
(c) SUBSISTENCE COM COMMERCIAL (d) SPECIFY

7.7 DO YOU SOMETIMES SELL YOUR PRODUCE TO MIDDLEMEN AND IF YES WHY?

MARKETING

8.0 WHICH IS YOUR MARKETING AGENCY OR MARKET FOR YOUR PRODUCE?

8.1 HOW EFFICIENT IS YOUR MARKET IN TERMS OF

- a) PRICES..... TICK EXCELLENT GOOD POOR
- b) DELIVERY
- c) CONTRACT COMMITMENT
- d) PAYMENT
- e) DEMAND FOR GOODS
- f) ACCESS TO INPUTS
- g) SPECIFY

8.2 WHICH IS YOUR GREATEST MARKETING PROBLEM?

9. TRANSPORTATION

9.0 WHAT MODE OF TRANSPORT DO YOU USE WHEN DELIVERING YOUR FARM PRODUCE?

9.1 WHAT KIND OF TRANSPORTATION PROBLEMS DO YOU FACE IN REGARDS TO ACCESSABILITY TO YOUR MARKET?

10. INCOME

10.0 ESTIMATED TOTAL INCOME PER SEASON/YEAR

AMOUNT IN (K) SHILLINGS

TICK

- a) 0 - 499
- b) 500 - 999
- c) 1,000 - 1,4999
- d) 1,500 - 1,999
- e) 2,000 - 2,499
- f) 2,500 - 3,000
- g) 3,000 - Specify Approximate Amount.

10.1 EXPENDITURES PER MONTH IN (K) SHILLINGS IN THE FOLLOWING AREAS.

- a) Agricultural inputs
- b) Transportation of produce
- c) Education
- d) Fuel
- e) Food
- f) Others Specify

10.2 Estimated Savings per Season/Year in Shillings.

10.3 Which Are your main Sources of Financial Credit and Loans?

- (a) Marketing Agencies
- b) Co-Operative Society
- c) Government
- d) Banks
- e) Informal/Personal
- f) Formal/Personal.

11.0 AQUISITION

TYPE OF LAND AQUISATION.

- a) Bought (b) Alloted by Government Ministry concerned.
- c) Rented (d) Inherited.

11.1 DO YOU HAVE A TITLE DEED?

YES/NO

11.2 IF 'NO' WHY?