PLANMIN FOR EDUCATION IN KISUMU MUNICIPALITY

BY

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A Thesis submitted in partial fulfillment of the requirement for the degree of Master of Arts in Urban and Regional Planning, Faculty of Architecture, Design and Development, University of Nairobi.

DECLARATION

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

(Candidate)

This Thesis has been submitted for examination with the approval of the University Supervisor.

(Supervisor)
S.O. AKATCH
DEDICATION

To My Mother and Father for giving me the impetus

To Jayne for her support.
ACKNOWLEDGEMENT

I wish to extend thanks to my Supervisor Samuel Ochieng Akatch in appreciation of his guidance and constructive criticism, Dr. W.O. Oyugi for his interest in my work.

I am extremely grateful to Jayne Muyoti for helping me in the proof-reading and editing my work.

I am greatly indebted to my sponsors the German Academic Exchange Programme (DAAD) for giving me this chance to further my education, the members of staff of the Department, of Urban and Regional Planning for creating an atmosphere conducive to work, special thanks to Serah and Mary for typing my work.

Special thanks goes to Joseph Otin and Samuel Opiyo my two research assistants who went to great lengths to ensure that I got necessary data.

Last but not least to all the Public Officers in Kisumu who helped me and to all friends who gave me encouragement I express my gratitude.
Planning for education anywhere is always a long term process. This is mainly because it is necessary to preempt a situation where the demand for education facilities is not met adequately. It is also necessary to look at the different levels of the education hierarchy and how they relate to each other and therefore how planning at one level affects the other levels. There is also a need to relate the planning of these facilities to education policy to ensure that the policy is implementable in planning terms. The growth of an urban area, its land use distribution at present and in future very much affects the location and distribution of education facilities. Forward planning for these facilities must therefore take cognisance of such parameters.

Other factors which directly affect the site location of education facilities such as accessibility and future land for expansion are also crucial to education planning.
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CHAPTER ONE

1.0 INTRODUCTION

Frankena (1965) writes that Aristotle considered education to be the transmission and acquisition of virtue or excellence. This is moral, intellectual or physical. Kant, he writes, called it the development of disposition or excellence. It makes man prudent and gives him wisdom or civilises him and moralises him and gives him guidance. John Dewey on the other hand contented that education is the process of forming fundamental disposition, intellectual and emotional towards nature and fellow men. He said that the goal of education was to make action intelligent.

It is on basis of these underlying goals of education that the author took up the study. Education be it formal or informal is the ground of the society's development.

In any planning process, the planner attempts to be as comprehensive as possible so as to achieve harmony in the plan proposals. One of the setbacks in comprehensive planning is that it is difficult to identify all the factors that are likely to have impacts on the plan. In this study the author looked at residential land use, working places and population parameters.
It is contended that action be taken on several fronts simultaneously if planning is to be effective. The author has tried to integrate where possible the above identified parameters because there is a need for unified planning at all levels.

1.1 Statement of the Problem:

The rapid urbanisation process in Kenya has put great constraints on existing land uses. In Kisumu the problem has reached large proportions.

One major problem is the location of education facilities in the town. Originally schools were located in two bands as shown in Map No.1. Other schools sprang up as the need arose in new residential areas such as Shauri Moyo. But the two zones mentioned have the majority of schools in the main urban area.

However, the town has grown very rapidly in the last few years and is still expected to do so at a high growth rate thus resulting in pressure on the existing education facilities which are no longer able to accommodate further expansion.

The development of the town along the Kisumu-Kakamega and Kisumu-Kibos roads shown in Map 11 has
SCHOOL LOCATION IN OLD MUNICIPAL BOUNDARY

LAKE VICTORIA
Plate 1: Residential Blocks surrounding the school in the Background.

Plate 2: Private Schools: A response to the need for more secondary schools.
rendered the location of these institutions inappropriate to meet present and future needs.

The boundary extension in 1976, of the Municipality was in response to the expected growth of the town. Manyatta and Nyalenda sub-locations were originally outside the Municipal boundary yet they had over 50% of the total urban population. Most of the people working in the town live in the slum settlements in these two sub-locations. The extended boundary thus included these two sub-locations among other rural ones. It has now been made possible to develop new residential areas for the urban residents and improve the slum areas. These new residential areas will require facilities such as schools.

The Municipal Council has now a wider area to develop. It has thus been necessary to acquire land for expected future development. This in effect has raised land values and in effect has raised the cost of developing new sites for schools. The transportation network for Kisumu was designed for relatively smaller town. However as the town has expanded so has the volume of traffic. New residential areas have been put in Kanyakwar and Mogosi areas. These people have to travel to the town centre and they use the Jomo Kenyatta Highway. The road was not designed for such large traffic. The new
structure plan for the Municipality therefore proposes a by-pass to reduce this traffic. But it is still envisaged that intra-urban traffic on this road will continue to rise as the town develops towards Kibos. Students have to cross this major road going to and from school. The road has however become increasingly dangerous for the students. Between 1985 and 1986 there was an increase of fatal accidents involving pedestrians from 11 to 22 people an increase of 50% along this road. This calls for a need to look at the safety factor for students crossing the road, especially the primary school children.

The existing schools were built on plots which were sufficient for the student populations per school. The average size per primary school was .6 acres. Many old schools met this requirement. However with rapid urban development many schools are being surrounded by land uses such as shops and residential houses (Plates 1&2). In fact schools such as Kisumu Union Primary school cannot provide sufficient playing ground for the pupils. With the building of new classrooms for the new education system schools such as Kibuye Mixed primary have been forced to use up the playing ground for such development. The existing classrooms in the main urban areas are generally crowded while the ones in the rural parts of the municipality are under-utilised. This is due
to the disparity in densities between these built up areas and the rural municipality.

The 8.4.4. education system necessitates provision of extra classrooms, workshops, laboratories and agricultural demonstration plots for both primary and secondary. The existing schools have to accommodate all these functions on the existing plots. But it is prudent that any new school caters for such demands.

The structure plan for Kisumu (Kenya, 1986) approved in 1986 sets the growth directions for Kisumu in a linear fashion running from the Kibos area towards Kisian as indicated in Map 11. This necessitates detailing of the expected location of schools and relocation of existing schools depending on the planned land uses. It also implies that an educational plan take into account the areas which are most likely going to be developed in the near future.

The study thus sets out to seek solutions to the above problem.

1.2 Justification of the Study

Urbanisation in Kenya has been rapid and has caused its own peculiar problems. In the field of education we have seen that it is crucial that many factors be considered in planning for education
institution growth and distribution.

High demand for land within urban areas necessitates provision of adequate land for future development. Many schools in Kisumu have exceeded their normal capacity of 45 students per class and there is little space for expanding these schools.

No planning study has been undertaken in Kisumu in relation to education and the implication the growth of the town has on education institutions in the Municipality.

With the introduction of the 8.4.4. education system, the problem of education planning in Kisumu and in the country as a whole has taken new direction requiring a new look at the planning issues this new education policy arises.

It is also essential to ensure that in implementation of any land use plan in the town, it be ensured that education plans are harmoniously implemented with any such plans. This requires a critical study of the education planning as it relates to Kisumu to ensure that the population site selections and standards are complementary.
1.3 **Objectives**

The study of the Municipality's education institutions has been undertaken due to the problems identified. The research set out objectives that would help anticipate and alleviate these problems. These objectives are:

1. To appraise the population size, structure and distribution and growth.
2. Determine the existing education institutions' land availability and demand
3. Establish the working place and residential land use and projected direction of growth
4. Evaluate the education standards as it related to location of schools and future urban development,
5. Relate school distribution and residential land use development.

1.4 **Assumptions**

The study made assumption that:

1. Growth of the town will continue along the Kisumu-Maseno and Kisumu-Kakamega roads corridors.
2. Education policy will not change for the next 20 years.
3. Population that survives will have similar age group ratios as the immigrants since most inmigrants come from Nyanza which has the same average survival rate as the study area.

1.5 Scope of the Study

The study area was the Municipality of Kisumu, though more emphasis was given to the built up area within the old Municipal boundary as shown on map 2.

The study included all levels of education, including nursery, primary and secondary schools. Assessment was undertaken for the population size, structure, distribution and growth upto 2000 A.D. A sample survey was done to determine existing population structure especially in the main urban area. This survey included occupancy ratios and population at different levels of education institutions. The relationship of schools to residential areas was analysed to determine the distance ratio.

Land use survey was undertaken to determine the possible direction of growth of the town.

To ensure that the transportation system keeps up with the other land uses, development, especially education, potential bus routes were to be identified.
to incorporate them with education institutions development.

A traffic survey on Kenyatta Highway was conducted to determine the safety factor for the many schools adjacent to the road.

Education standards were reviewed in the light of the 8.4.4. education system to determine their validity.

The study was thus geared towards coming up with planning proposals that would enhance the development of education institution in the Municipality of Kisumu.

1.6 Methodology:

1. Sources of Information:

Statistical data which was mainly of a secondary nature was obtained from the University of Nairobi Library and Government publications in the Ministry and secondly statistical and qualitative data was obtained from the public officers in the field, at the Ministries and Municipal offices.

The household survey was conducted within the old Municipal boundary. The samples were undertaken in areas of different densities and incomes as follows:
Table 1

<table>
<thead>
<tr>
<th>Residential Area</th>
<th>Persons/ Hectare</th>
<th>% of population</th>
<th>% of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Density</td>
<td>1,200</td>
<td>60</td>
<td>64.5</td>
</tr>
<tr>
<td>Medium Density</td>
<td>130</td>
<td>30</td>
<td>31.2</td>
</tr>
<tr>
<td>Low Density</td>
<td>30</td>
<td>10</td>
<td>4.3</td>
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</table>

Sample Distribution.

The emphasis on the old Municipal boundary and parts of Nyalenda, Manyatta and Pandpieri was deliberate since these areas form the main built up area of the Municipality.

The household questionnaires which were designed as simply as possible were mainly aimed at getting information on centrality of schools, occupancy ratios, family size and structure, inmigration, population in schools, outmigration of students.

Physical land use surveys were undertaken to determine the potential growth direction of residential, commercial and industrial development.

A traffic survey was conducted on Jomo Kenyatta highway to determine the volume of traffic that would be transferred to the new by-pass in Manyatta, and to find the safety measures that should be
undertaken along the road for the students' safety.

Informal interviews were conducted with head-teachers, students and other urban residents. This generated information which would have been difficult to obtain from a more formal approach and helped the researcher get a more or less comprehensive picture of the problems of education institutions in the town.

2. Data Analysis

Firstly the researcher analysed data on population. From the sample population structure it was possible to come up with an estimation of the general population structure. This was used to project the cohort survival for the next 15 years assuming that the sample was representative of the population.

The Cohort survival method was chosen because it breaks the population into small groups such as age and sex. It thus allows for planned change and for other local changes not systematically included in the calculation such as migration rates. Disaggregation of population into sex and age groups allows for disaggregated forecasts. This is important for education planning because school facilities are designed to accommodate particular age groups.
Though this method is not fool proof it gives us a better picture of the future population than the aggregate methods projection.

Survival rates used were based on the rates established by the Population Research and Studies Institute.

Determination of future space requirements for different land uses is important for a study of this nature. However the researcher limited such projections to residential and education land use requirements. However possible directions of growth of industrial and commercial land uses are indicated.

The standards given in the Town Planning Handbook were analysed to allow for the incorporation of the new demands of the 8.4.4. education system.

Christaller's central place theory, which states that if there is an isotrophic surface with equal movement ease in any direction, a uniform distribution of population and purchasing power, and uniform terrain and resource endowment, then settlements will spring up at evenly spaced points (Abler, et al., 1977, p.370) gives a good framework for establishing location of education institution. Thus based on the underlying
principles of threshold and range found in this theory, schools were to be located in areas which have the most centrality so as to achieve an even distribution of these facilities.

The enrollment ratio was used to determine the adequacy of the existing standards especially in the primary schools.

1.7 Study Limitation

From the 1979 Census records it was not possible to get the population of the Municipality by age groups. Estimates were therefore based on the sample survey. These estimates are not very accurate but they give a guideline in the analysis.

Data on the population size, structure and spatial distribution of the pupils in the Nursery schools was not available so it was not possible to determine the attendance ratio.

1.8 Literature Review and Conceptual Framework

Kenya like many of the developing countries placed considerable importance in the role of education in promoting economic and social development after the achievement of independence. The education systems
are expected to fulfill two basic objectives. These include the technical objective of furnishing future manpower with requisite skills and knowledge and the social objective of the inculcation of those actual values which contribute to the enrichment of the people's maintenance of a cohesive productivity. (Sifuna, 1986).

To achieve this the planner has to ensure that the facilities for education are provided where and when needed. It is necessary to ensure that planning for education be undertaken to provide an environment conducive to learning.

Expansion in education at all levels has been tremendous. This expansion is reflected especially in the increase in the number of students enrolled in schools. By 1982 Standard I enrollment of school going age children all over Kenya was estimated at 83.9%. (Sifuna, 1986). In urban areas this figure is higher.

Secondary school enrollment rose from 30,000 pupils in 1963 to 115,000 in 1969 to 500,000 by 1983. By 1990 this figure is expected to reach a million. It is due to this rapid increase in education demand that it is necessary to plan for these facilities.
Planning standards are the yardsticks established for ensuring of a controlled and reasonable development of land use. Education planning standards are designed to:

1. Create a healthy and quiet environment in educational areas.

2. Provide adequate land and built up area necessary for classrooms, laboratories, playgrounds and other ancillary facilities.

3. Provide easy access to schools and efficient circulation on the school compound and

4. Establish harmonious relationship between education, residential and recreational areas.

It is thus necessary that in this study attempts be made at ensuring that achievement of the above goals be the guiding framework. However we find that the standards given by the Town Planning Handbook (1971) may not be applicable at all times. These standards are summarised below:
Table 2:

<table>
<thead>
<tr>
<th>School Type</th>
<th>Population served</th>
<th>Area in Acres</th>
<th>Description</th>
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<tbody>
<tr>
<td>Nursery School</td>
<td>2,500</td>
<td>1</td>
<td>100 pupils</td>
</tr>
<tr>
<td>Primary School</td>
<td>5,000</td>
<td>6</td>
<td>3 - 4 streams</td>
</tr>
<tr>
<td>- Boarding</td>
<td></td>
<td>1</td>
<td>700 boarders</td>
</tr>
<tr>
<td>Secondary School</td>
<td>25,000</td>
<td>17(\frac{1}{2})</td>
<td>3 - 5 streams</td>
</tr>
<tr>
<td>School, day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Boarding</td>
<td></td>
<td>45</td>
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Town Planning Department School Standard.

P.S.  a) 1 acre for demonstration plots
      b) 2\(\frac{1}{2}\) acres for 30 staff houses in primary school
      c) Secondary school land includes site for Agriculture and staff housing.

We find that most of these standards are applicable where there is expansive land which can be acquired cheaply. In urban areas the land constraint forces one to re-evaluate these standards to cope with the urban situation.

With the introduction of the 8.4.4 education system in Kenya these standards have been rendered
invalid because of the increase in the number of classes in a primary school, and the abolition of the "A" level class in secondary schools.

Bareither (1968) argues that the translation of educational programme into physical facility requirement involves a constant evaluation and re-evaluation of the enrollment projections, changes in education programme, inventory of existing facilities and development of new facilities dependent upon institutional requirements.

However Goodman and Freud (1968) argue that the physical facilities should not be seen in isolation and that the planning process is not just a translation of policy to land use but that the planner must be involved at policy making level. Kennedy (1979) takes this argument further and says that the location of education institutions could be geared so as to enhance community development.

This argument is due to the fact that schools are best located in a neighbourhood since that is where its students live; it also provides facilities for the people in the neighbourhood community. Thus the emphasis that this study places on residential-school relationships.
Chapin and Kaiser (1979) point out that the space needs alone are insufficient in land use planning for schools. Assessment of other land uses and inventory would give a better picture and thus lead to a more comprehensive and integrated plan. Goodman and Freund (1968) also bolster this argument. They give examples where one needs to know the commuters to the institution (e.g. a University) and how this relates to the immediate neighbourhood. He recognises that education institutions are an integral part of a larger environment, and should be planned as such.

Other writers such as Perkins and Corking (1951) Wright and Gardner-Medwin (1938) also hold the same view of planning for education in relation to the neighbourhood. They give special emphasis to nursery schools which they say should be a walking distance of \( \frac{1}{2} \) a mile for the children who attend them and such a school should be located away from traffic and noise and children should not have to cross a main road, or secondary traffic roads on their way to school.

However in urban areas we find that such optimal situations are not normally available but it is best to try to ensure that schools are put as close as possible to the users. This strengthen the
argument for neighbourhood schools.

Chapin and Kaiser (1979) argue that it is necessary to locate schools in flat land to allow for future expansion. This is crucial especially in urban areas where land is scarce thus necessitating that each school have a land bank within its fence.

We are always planning for people so we have to know what is desirable for our target population. In planning for education, the population of school going age and the catchment population are the two main population factors we have to consider.

Among the demographic factors which influence education most is population structure. The increase in economic activity of the population determines the number of people who can get education, especially where the education is not for free.

Wright and Gardner-Medwin (1938) point out that in determining the future growth of a school and thus its expansion, the child population rather than the total population should be used. The total population is only used to determine the urban growth.

The UNESCO report (1975) breaks down this student population into disciplines, full-time or
part-time student, under-graduate or postgraduate etc. when one wants to undertake a detailed study. The academic and supportive staff must also be considered.

It is on this basis that the author in this study undertook to use the Cohort survival method to project the population. This would help in determining with some degree of accuracy the actual demand for these institutions in the future.

Education is based on both family and school life. This is the main reason why schools are planned as part of the neighbourhood. A neighbourhood school is made up of families which may combine into a community and has definite social contacts and a recognizable physical unity. To achieve a "working" neighbourhood the plan can provide incentives for the people to get a feeling of living in one place distinct from others.

Schools can be used to achieve such a goal. Goodman and Freund (1968), King, (1976) say that with school buildings within easy reach parents and teachers have a chance of contact and the school is accepted by both children and parents as part of their neighbourhood.
However only nursery and primary schools can be made as integrated part of a neighbourhood. At secondary and higher education levels, it is less possible to provide such facilities at a neighbourhood level but such schools can be provided when and where possible as part of a comprehensive school. Such a school agues King (1976) would have a bigger role to play as a community centre especially if the school is planned at the heart of a neighbourhood as its focus.

Where possible a secondary school should be included in the comprehensive school. To ensure that the school acts as the focus of the neighbourhood, it should also be developed as a community centre. The school hall could be used as a cinema hall for the community. The classes could be used in the evening for adult literacy classes and the playgrounds should open for the people in the neighbourhood to use for recreation.

In rural areas it has been easy to make the school the focus for the community function since it usually has the only available open space and facilities for games and room for congregation.
Urban schools are often closed after school. During the weekend the school gates are closed and the school looks forbidding. However to ensure that not only does the school serve as a community centre but also as a recreation ground the above strategies have to be accepted by both children and parents as part of their neighbourhood.
References


CHAPTER TWO

2.0 HISTORY OF EDUCATION IN KENYA

2.1 Introduction

A policy is a course of action adopted and pursued in attaining goals or achieving objectives (Goodman and Freund, 1968, p.335). Any developer must undertake projects and programmes implementation based on the policy as a guideline to achieve his objectives.

In education, the main objective of the Government is to provide equal education opportunities for all, the enrichment of the heritage and production of skilled manpower to meet the growing and changing demands of the economy.

2.2 Pre-independence Education System

The church on settling down in Africa decided to "educate" the African so that he (the African) could be able to understand the bible well enough to be able to woo his fellow Africans into Christianity.

Government policy on education took a turning in 1911 when the education department was set up by the colonial government. This was primarily to administer three schools for European children.
The education of Africans was left to the Missionaries. Each mission would set up its own school. This gave rise to schools such as Alliance, St. Mary's, Yala, Maseno School among others. The important feature of these schools is that they could be grouped into two: Roman Catholic and Protestant.

Government funds were offered to Mission schools only in so far as they offered industrial education. These schools thus produced labourers for the settlers.

The second Phelps-Stokes Commission report on education of 1928 looked at East Africa. It gave the main thrusts to the mission school system. Beaver (1966) notes that the commission emphasised the need for a teacher training institution and secondly it led to grants-in-aid by colonial government for schools and training colleges maintained at government approved standards. But as mentioned earlier, the grants-in-aid ended up solely for schools with industrial education.

The Jeanes School at Kabete, also started in 1928 was a scheme for training supervising teachers for village education. A look at the timetable for the student, below, will show why it failed as a source of supply of trained teachers for schools:
### Table 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.00 to 8.00</td>
<td>School Gardens (Tree Planting grass cutting, making mats etc.)</td>
</tr>
<tr>
<td>8.00 to 8.45</td>
<td>Arithmatic</td>
</tr>
<tr>
<td>8.45 to 9.15</td>
<td>Drill</td>
</tr>
<tr>
<td>9.15 to 9.30</td>
<td>Break</td>
</tr>
<tr>
<td>9.30 to 10.15</td>
<td>Reading (4 days/week) or Hygiene and morals (2 days/week)</td>
</tr>
<tr>
<td>10.15 to 11.15</td>
<td>Handwork (Baskets, mats, etc.) (3 days/week) or Writing and measuring (3 days/week)</td>
</tr>
</tbody>
</table>


The wives of the students were taught hygiene, sewing, etc.

From the timetable we see that the training did not give the students confidence and ability in academic subjects to give the intended boost to standards in primary schools. They were more geared to public/community education. Thus the Jeanes school pettered out.

Thus we see that upto independence schools developed as factories for producing literate people with a bit of organisation compliance but they were at a loss to do much more (King, 1976).
Under the colonial system there was the assumption that different racial groups would remain separate, if not for all time, at least for a long time to come (Sifuna, 1986).

2.3 Education System from 1963 upto 1986

The Ominde Commission report (1964) became the blueprint for establishing the education system as we have come to know it. The Commission did away with the racial segregation and established a uniform curriculum for schools. Many of the recommendations were made part of the Education Act which has since guided the development of education in Kenya.

The emphasis however was on post-primary education, namely secondary, commercial, technical and higher education. The aim was manpower production. This was for the key post which would be occupied by Africans in the Africanisation and Kenyanisation of the Civil service and the economy. But soon these posts were filled and the educated jobless people began migrating from places seeking employment. More often than not they were not willing or able (as King, 1976 suggests) to do any but "white collar" jobs. They had been trained to expect these jobs.
Sifuna (1986) notes that efforts were made to avoid the rapid expansion of the primary education to meet general popular demand. But this trend was abolished as the objective of manpower requirement for the civil service was met. The new trend however resulted with more and more demand for form one places in secondary schools. There was also a subsequent increase in graduates at every educational level and this was always in excess of the number of places at succeeding stages.

The result was harambee schools. These were set up by local people who felt the need to ensure that their children got secondary education. Education was (and still is), the key to employment. As the labour force flooded the market there was a need for one to go as high up in the education system as possible.

The employment problem was taken up by International Labour Organisation (ILO 1972). The report emphasised the need for basic education in the country, proposing a universal free eight to nine years covering primary and lower secondary education. There was great concern over the failure of secondary education to equip those leaving school with the
necessary skills required in the labour market, particularly in the area of technology.

In 1973-79 Presidential decree abolished school fees for standards one to four and this set way for free primary education for all, which was achieved by another Presidential decree in 1979. This was in line with the KANU government's guiding principle of giving priority to education so that all Kenyans could share in nation building and enjoy the "fruits of independence".

There was subsequently a staggering rise in school enrollment which made planners to rethink of programmes and priorities in education planning.

The total enrollment figure for standard one to four increased from 1.8 million in 1973 to 2.8 million in January, 1974. Many students would drop out after standard four.

Nkinyangi (1978) says that in terms of opportunity structure for schooling nothing really changed, many parents who were not well endowed economically, educational access or their children's continuation with school remained a very doubtful preposition.
The introduction of the building fee now however rendered the concept of free primary education obsolete. In most cases it had turned out to be higher than the school fees that was charged prior to the decree (Sifuna, 1986). At the time of the abolition of the school fees no counter measures were announced on how to replace the revenue lost through this decree.

Children who had been absorbed in schools due to the building fund were discouraged and dropped out. This is mainly because to secure employment one needed not just primary education but post primary training as well.

The National Committee on Educational Objectives chaired by Gachathi (1976) placed a lot of emphasis on providing basic primary education which would help the school leavers be self employed. It was based on the I L O report (1972) recommendations which have been stated earlier.

Before independence Africans had been dissatisfied with technical education as they felt that technical and vocational education was meant to restrict them to an inferior position. Nzomo (1984) notes that this type of education was informally labelled "education for servitude".
The Gachathi Commission (1976) recognized that a time had come when Kenyans once more could place emphasis on technical education with the colonial element. It realised that grammar education alone would not be able to prepare the pupils sufficiently on completing primary education. Thus it proposed a new form of education system which would set a basic education of 9 years in primary. This was designed to train the students in crafts and trades and in the process make them self-reliant. This approach recognised the need for low and medium level skilled manpower.

The Mackay Commission (1981) adopted most of the recommendations of the NCEOP but suggested 8 years basic education and the eradication of the "A" level classes. With a subsequent 4 years University education for undergraduate.

Table 4

<table>
<thead>
<tr>
<th>Education level</th>
<th>Mode 1 Ominde Commission</th>
<th>Mode 2 NCEOP Proposal</th>
<th>Mode 3 Working Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>7</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Secondary</td>
<td>4 + 2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>University (Undergraduate)</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>
The "A" level system had been found wanting since some areas did not have "A" level streams and therefore the youth in these areas had a low chance of getting University education.

The Commission also noted that it is cheaper to maintain an Arts stream than a science stream thus most "A" level streams have tended to be Arts and this has resulted in overproduction of Arts students who cannot get absorbed into the labour market subsequently.

At "O" level students take both Arts and Science subjects therefore the distribution between Arts and Science subjects is more or less equal.

The Mackay Commission emphasised pre-vocational training or basic education at primary and secondary level. It hopes that students will be self reliant on leaving school.

Although the system is still in a transition stage, it is likely to face problems of costs (Sifuna, 1986). Schools have to construct laboratories and workshops and extra classes coupled with the need for land for Agricultural courses.
The assumption that pre-vocational skills taught at primary and secondary levels would improve the employability of school leavers has never been tested. It is highly unlikely that the amount of skills in woodwork, masonry or typing that can be acquired at primary and secondary level, will improve the chances of a school leaver to find employment or to make a living on his or her own using those skills. The training is often more or less superficial but the programme need a greater evaluation to come up with a clearer view.

Demand for educational opportunities will continue as long as education is viewed as the most likely way of maintaining and possibly improving peoples position in society.

Sifuna (1986) points out that studies in a number of developing countries have found higher rates of return investment in primary than in higher education.

With the likelihood of universal primary education planners have to look at the planning implications of such an eventuality, which might not be too far in the future.
The development plans have been changing in content since 1964 in relation to the findings of the Commissions. However the Sessional Paper No.1 of 1986 shows a great shift from this trend with the emphasis on cost sharing in provision of facilities. This will bring parents at the forefront in project implementation and the planner must also consider this in planning for education.
References


CHAPTER THREE

3.0 KISUMU: LOCAL AND REGIONAL CONTEXT

3.1 Introduction

Located at the North Eastern tip of the Winam Gulf, Kisumu Municipality is the third largest urban centre in Kenya with an area of 417 sq.km. of which 260 sq.km. is land and 157 sq.km. is water. The town had an area of 53 sq.km. upto 1976 when the boundary was extended to its present size.

The name Kisumu is derived from a Luo word 'Kisuma' which means a place where the hungry get sustainance. It developed as a central place for bartering and thus the name Kisuma.

3.2 Relief and Drainage

The Municipality of Kisumu lies in the downfaulted lower ridge on the floor of the geographically complex Nyanza rift valley. Originally the town covered the residual rift hill which now contains half of the built up area including the commercial centre government offices and the better residential areas. This is due to the fact that this area is better drained and thus was settled first by the railway workers and the colonial administrators. The Municipality has however expanded to include the poorly drained areas such as Nyalenda and Nyamasaria.
Plate 3: Type of Schools in the Slum Areas and the Rural Parts of the Municipality.

Plate 4: Upgrading of Schools in the Slum Areas.
Expansion of the Municipality is limited by the Nyando hills to the north, Lake Victoria to the south west, Miwani Sugar Plantations, Ahero Irrigation Scheme and the seasonal swamps to the east.

All the streams within the Municipality drain into the Winam Gulf, however due to the very gentle gradient, some of the streams form vast expanses of swamps.

The soil is mainly alluvial except for the better drained residual hill at the core of the municipality which is composed of denuded granite. To the east, black cotton soils cover most of the land in many areas which are subjected to seasonal flooding.

3.3 Climate

Kisumu lies in a region with no definite rain season but it has two rainfall maxima in April, being the principal one, and in December. The region has an average annual rainfall of 1,278 mm, ranging from a maximum of 1,884 mm to a minimum of 942 mm. Temperature ranges from a maximum of 14 - 18°C to 26 - 34°C maximum.

The area enjoys a modified equatorial climate modified by relief and the large water mass of Lake
Victoria. This results in great variations of rainfall. The basin form of the lake tends to increase temperatures although the lake itself exerts a cooling effect, thus resulting in temperatures lower than an equatorial climate.

3.4 Historical Development of Kisumu

The surveyor for the Uganda railway found that the shortest and cheapest route from Mombasa to Lake Victoria was over the Mau ranges down the Nyando valley to Ugowe (Kisumu). This initiated the decision to move the headquarters of Western Kenya to Ugowe. The town was founded in preparation for the arrival of the railway in 1898. It was named Port Florence after the wife of Ronald Preston, a railway engineer. The chief engineer Captain George Whitehouse who founded the town developed it as an alternative railway station and port replacing Port Victoria near the mouth of River Nzoia.

In 1901 the Uganda Railway reached Kisumu thus opening up the region and connecting it to the rest of the country. By 1903 when the railway was opened to full use it was moved to the higher ground on the northern side of the Gulf thus setting a precedent for future town growth. In 1902 the name
Florence had been dropped in favour of Kisumu.

By 1910 Kisumu was the main township and trading centre in Nyanza, a role it has kept to this day. It also had a high concentration of industries surpassing other urban centres in Western Kenya, and thus it had a higher percentage of African population than any other town in the region thus creating a need for planning of facilities such as schools.

After 1918 the young men recruited by the British East African Police force which had established itself there in 1905, were among the first local people to go to the town.

However when in 1920 the Nakuru-Tororo line was opened, Kisumu began to decline, rapidly, which decline it is still recovering from.

Under the new Township Ordinance No. 63 of 1930 Kisumu was designated a Grade A Township and the boundary was reduced to the 1923 limit to make it 'more manageable' This reduction in boundary limits effectively excluded the African neighbourhood.

In the 1938 - 48 period there was a mass out-migration from the town as the gold rush declined and the Tororo line took its toll.
By 1941 the town had its own local government. Tenant purchase and rental housing schemes were developed in the late 50's but they could not compete well with the cheaper peri-urban housing which continued to grow at a tremendous rate.

This development of uncontrolled settlement has caused planning problems especially in the provision of community and social facilities.

In 1962 Kisumu became a Municipality covering 53 sq.kilometres. In 1976 the boundary was extended to cover 417 sq.km.

3.5 Planning in Kisumu from 1900 - 1986

Kisumu, planned as a terminus for the railway line has since developed to a regional centre serving most of Nyanza and Western Provinces. It is necessary to understand how the town is planned to appreciate if it is capable of playing its role as a major national centre and a regional capital.

The first plan prepared for the town by Ternand and Hobley included provision of landing wharves along the lake shore, government buildings and commercial area. The residential area was planned somewhat further offshore.
RESIDENTIAL LANDUSE PATTERNS 1908

LAKE VICTORIA

ZONE A MEDIUM DENSITY
ZONE B BUFFER ZONE
ZONE C AFRICAN AREAS
ROAD
RAILWAY LINE
TOWN BOUNDARY

PLANNING FOR EDUCATION IN
KISUMU MUNICIPALITY

SOURCE: KISUMU STRUCTURE PLAN 391-393
& 390-392 1975

MAP 6

M.A. THESIS
DURF
PLANNING FOR EDUCATION IN
KISUMU MUNICIPALITY

MAP 7

M.A. THESIS
D.U.R.P.
PLANNING FOR EDUCATION IN KISUMU MUNICIPALITY

LAND USE 1969-1986

SOURCE: KISUMU STRUCTURE PLAN (0-2013) & FIELD SURVEY

M.A. THESIS D.U.R.P. MAP 8
A bubonic plague outbreak in 1908 led to the zoning of residential areas. Zone A would have the Port, official residence, for officers, headquarters, Jail, police lines, hospital and was occupied by Indians and Africans employed in the town, and white men. Zone B was a buffer zone between zone A and zone C where the bulk of squatters lived, thus stopping the spread of the plague (Obudho, 1976).

After World war one a plan was prepared zoning land according to ethnic background (Obudho, 1976). Thus the African areas were divided among different ethnic groups such as the Nubians, Waganda, Wanyamwezi and most of these areas have upto very recently retained these ethnic characteristics.

Therefore we find that areas in former zone A have tended to be better planned while the African areas have remained slum settlements.

By 1969 the town had well established zones which were mainly a result of colonial planning. The short term development plan for the town prepared in 1969 for a five year period did not do much to change the land use pattern and Obudho (1976) points out that the planning and layout of the better residential areas and the town centre can be traced as far back as 1902.
The 1969 plan and the structure plan of 1983 - 2013 both point out that migration into the town would be the main factor influencing the town's growth.

By 1986 the town had a commercial zone with Oginga Odinga road as its centre. This zone surrounded better shops and warehouses to cater for the town and the region. Down Oginga Odinga road was the so-called bazaar area, which was more African than the Asian dominated areas on the upper part of the road.

The Milimani area is mainly made up of high income people and the densities here are about 30 persons per hectare.

There are medium income houses in the areas near Kanyakwar. However Municipal housing estates are now also considered as medium income houses because though they are relatively cheap they are unaffordable for the people earning less than 1,200/- per month who are categorised by the C.B.S as low income earners. However a lot of sub-letting is practised.

To the north-east and the east are peri-urban suburbs made up of slum settlements of Pandpieri, Nyalenda, Manyatta, Migosi and Kanyakwar. These
areas house the majority of the urban population and have continued to do so as new migrants move into town.

At present the town is set to expand rapidly. The government decentralisation policy, the rejuvenation of the E. African trade by road and lake has set the pace for rapid and high migration rates in the town.

The peri-urban slums are being upgraded (Plates 3&4) thus providing a better residential environment. Land has been acquired to the north of the town for construction of new housing. In fact in the past three year housing construction has been booming in the town financed by Housing Finance Companies and co-operative societies. A site and service scheme has also been started.

What does this portend for the town as a regional capital and a major national urban centre in terms of education?

As new housing estates grow, there will be need for new nursery, primary and secondary education.

3.6 Regional Functions

Regions can be defined by several factors, including industry, farming, population distribution, commerce or the general sphere of influence.
Dickinson (1964) defines a region as primarily a functional entity. Geographically it extends as far as the city, exerts a dominant influence. Its influence is effected in its environs by a radiating system of traffic routes, each of which in its turn is a local centre of radiating routes through which it, rather than the metropolis, becomes the dominant centre for local affairs.

Kisumu is the dominant town in western Kenya interconnected to Tanzania, Uganda, Western and Nyanza Provinces by traffic and rail routes. Commerce and industry in Kisumu needs no emphasis in its dominance in the region.

Kisumu experiences a nett immigration unlike the surrounding districts, (Oucho, 1974). However the region has been a labour reservoir in Kenya to the detriment of the region. But this trend is changing as the town grows thus attracting more and more inmigrants.

Basically the region is an agricultural region though fishing is undertaken on the lake. Cash crops include cotton, sugar, cane, coffee and tea as the major cash crops. However maize and beans are sold as surplus. Grade cattle have also been introduced in
the region thus increasing milk production.

The Kano plains and the Yala swamp are areas where rice production is undertaken as a commercial scale.

Kisumu town accommodates a complexity of resources which raise the level of migrants' expectations, hence its dominance as an area of in-migration.

This rapid in-migration has caused poor housing conditions as noted by the field survey. Thus necessitating prompt action to reduce a situation where there might be no adequate provision for planning social and community facilities.

Kisumu may for a long time continue to be the core centre from which modernisation diffuses to all parts of the region (Oucho, 1974). This is especially so in secondary and other post primary forms of education. It has attracted students from all over the nation, especially the western region and this puts a constraint on the existing facilities. Education institutions of a wider threshold will most likely be established in the town since it acts as a centre for most of the development in the region.
The fact that education plants are of a better standard in the town has resulted in pupils moving into town to stay with friends and relatives to take advantage of these facilities. Thus planning for education must be viewed not only in the local context but the regional context too.

3.7 Existing Education Facilities

By 1986 there were fifteen secondary schools within the Municipality. Of these only five offered "A" level education. Four were government schools and the rest were either private or Harambee.

Government schools have tended to have large numbers of students as parents attempt to give their children a better chance of performing well in school.

Apart from Kibos high school, all the secondary schools are located within the old Municipal boundary, thus students from most parts of the Municipality would have to travel long distances daily to school.

Since the extension of the Municipal boundary in 1976, the number of primary school under the jurisdiction of the Municipal Council has more than doubled. This has resulted in a situation where the Council has to bring the schools to urban standards.
EXISTING SCHOOLS AND ZONES

PLANNING FOR EDUCATION IN KISUMU MUNICIPALITY

EXISTING SCHOOLS AND ZONES
It is important to note here that primary schools, like secondary schools, are generally concentrated within the built up area and the rest of the municipality has schools located sparsely. This is mainly due to the lower density of population in these areas.

Ramogi Institute for Science and Technology is the only post secondary College offering formal education. There is no Teachers College in the Municipality despite its regional role. Commercial and secretarial colleges have begun to spring up but these are not considered in this study since they fall outside the scope of formal education.

It is therefore necessary that one looks at not only the supply and demand, but also the possible distribution of the population in future.
<table>
<thead>
<tr>
<th>References</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Waller, P.P.</td>
<td></td>
</tr>
</tbody>
</table>
4.0  POPULATION, AND EDUCATION PLANNING IN KISUMU

4.1 Population Growth in KISUMU:

An assessment of population for Kisumu can be undertaken to a good degree of accuracy for the short-term, but for the long term several assumption have to be made.

In planning we plan for people and when population projections are made it is to allow the planner to be able to show what facilities and where there facilities are needed. Therefore overestimation can be taken care of as the implementation continues.

In order to estimate the population of Kisumu due to migration, it was assumed that the number of immigrants to Kisumu during the period between 1969-1979 equals the population of Kisumu less the survivors of the original 1969 population in Kisumu and less the survivors of the population born in Kisumu during the period.

To determine the population of the town, it was assumed that population structure will remain constant.
Comparing the population of 1969 and 1979 Kisumu had a population growth rate of 3.99% per annum with the 1969 population of 101,809 rising to 132,643 in 1979. However in these figures the population in the extended boundary area is considered for the 1969 population.

The old Municipal boundary had a population of 32,421 in 1969 and 38,572 in 1979 thus giving it a growth rate of 1.73% per annum. This figure gives a false impression. The area within the old boundary was almost fully developed and there was little space for further residential development. The outer fringes of the town which before 1979 were outside the municipal boundary began to grow rapidly. This included Myalenda and Manyatta sublocation. In 1969 there two sublocations had 19,988 people. By 1979 they had 44,786 people giving a growth rate of 7.6% per annum.

Population growth rates were calculated for the Municipality up to 2001.
Table 4: Population Growth Rates (Calculated)

<table>
<thead>
<tr>
<th></th>
<th>Total Growth Rate</th>
<th>National Growth Rate</th>
<th>Migration Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979-1986</td>
<td>7.65</td>
<td>3.5</td>
<td>4.15</td>
</tr>
<tr>
<td>1986-1991</td>
<td>7.7</td>
<td>3.2</td>
<td>4.5</td>
</tr>
<tr>
<td>1991-1996</td>
<td>6.32</td>
<td>2.9</td>
<td>3.42</td>
</tr>
<tr>
<td>1996-2001</td>
<td>5.9</td>
<td>2.7</td>
<td>3.2</td>
</tr>
</tbody>
</table>

We see that the migration rates have been higher than natural growth rate thus most of the urban population growth is attributed to migration. We must however note that migration was mostly to the Migosi, Nyalenda and Manyatta sublocations in period upto 1986. Nyalenda and Manyatta had a growth rate of 5.8% and 9.7% respectively between 1969-1979.

As the migration continues Migosi and Kanyakwar will continue to accommodate the population in the near future.

Kisumu is both a provincial and a district headquarters and thus there has been an increase of activity as the District Focus strategy gets implemented and other government and industrial decentralisation policies. Other sources of migration
could be attributed to the relatively higher levels of employment. Thus people have tended to move in search of employment.

Kisumu has a regional catchment and has attracted people mostly from Western and Nyanza Provinces.

From the sample survey the distribution of the migrants was as follows.

Table 5:

<table>
<thead>
<tr>
<th>Plate of Origin</th>
<th>in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality</td>
<td>8.9</td>
</tr>
<tr>
<td>Kisumu District</td>
<td>13.0</td>
</tr>
<tr>
<td>Siaya District</td>
<td>48.0</td>
</tr>
<tr>
<td>South Nyanza District</td>
<td>18.0</td>
</tr>
<tr>
<td>Western Province</td>
<td>8.4</td>
</tr>
<tr>
<td>Rest of the Country</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Migrants Distribution by place and origin.

We therefore see that Siaya had the largest single population catchment of 48% making up almost half the population of Kisumu. This may be attributed to the fact that before the establishment of Siaya town and the District focus
strategy, Siaya District had no major urban centre. Kisumu provided most of the major urban services for Siaya town thus creating a strong pull. However Siaya town's rapid growth (sometimes estimated at 21%) is expected to minimise the great migration from Siaya.

If Siaya can reduce the migrant population by 60% by the year 2000 A.D., the migration rate would fall to 5.90% assuming that the migration from the other districts, remain the same. This can be said with some assurance because Kisii, South Nyanza districts and Western Province have well established urban centres and there is little indications that out migration from these areas will reduce substantially due to more urbanisation.

The population of Kisumu will grow at a natural rate of about 3% per annum since family planning effect is reported to be very slight.

The distribution of population by age will be affected by migrants but it is not easy to determine the proportion of the migrants by age but the researcher has made the assumption that the population distribution by age will not change greatly due to
migration. Assuming a population growth rate of about 7% up 2000 A.D., the projected disaggregate population for Kisumu is expected to be as follows:

Table 6:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>56,386</td>
<td>79,987</td>
<td>108,666</td>
<td>144,734</td>
</tr>
<tr>
<td>5 - 9</td>
<td>35,184</td>
<td>47,992</td>
<td>67,069</td>
<td>86,821</td>
</tr>
<tr>
<td>10 - 14</td>
<td>32,016</td>
<td>43,471</td>
<td>59,057</td>
<td>78,660</td>
</tr>
<tr>
<td>15 - 19</td>
<td>35,712</td>
<td>49,384</td>
<td>67,089</td>
<td>89,457</td>
</tr>
<tr>
<td>20 - 24</td>
<td>26,208</td>
<td>34,777</td>
<td>47,246</td>
<td>62,928</td>
</tr>
<tr>
<td>25 - 29</td>
<td>21,816</td>
<td>31,299</td>
<td>42,521</td>
<td>56,635</td>
</tr>
<tr>
<td>30 - 54</td>
<td>41,880</td>
<td>59,121</td>
<td>80,318</td>
<td>106,978</td>
</tr>
<tr>
<td>55+</td>
<td>1,344</td>
<td>1,739</td>
<td>2,362</td>
<td>3,146</td>
</tr>
<tr>
<td>Total</td>
<td>240,000</td>
<td>347,770</td>
<td>474,328</td>
<td>628,359</td>
</tr>
</tbody>
</table>

Population Distribution by age-groups

From the above data we see that the age group 15-19 has a slightly bigger population than would normally be expected. This is attributed to the fact that this is the secondary school-going age and this population migrate to Kisumu to take advantage of the secondary schools there.
4.2. Education Institutions: Supply and Demand

The education system in Kenya is such that the higher one goes in the education ladder the higher the probability that one will not reach the next level. Therefore only a small percentage eventually end up in a higher education institution.

Fig. 1.

Dropout Distribution of students by education level based on statistical Abstract, 1984.
4.2.1 Nursery Schools

There are 45 nursery schools in the Municipality serving a population of 240,000 people. This means that a nursery school serves about 5,000 people.

Both the Town Planning Handbook (1971) and the Nairobi Urban Study Group (1974) state that one nursery school should serve 2,500 people. Thus we see that on this basis there is a shortfall of 50% in the supply of nursery schools.

From the sample survey 20% of the population is below 5 years of age, of there only 6% attend nursery schools.

The government policy on education is now aiming at an overall development of an individual thus it is encouraging nursery schools to initiate this development in an individual at an early stage. This policy should result in a larger percentage of the population attending nursery schools.

Assuming that this policy is effective then upto 50% of the children below 5 years of age are expected to attend nursery schools. In a population of 2,500 people we would have 500 children below five years and 250 would be eligible for nursery schools.
If we took 50% of this eligible population (250) then 125 pupils would attend. Thus a nursery school would need three classes assuming that each class has about 40 pupils and six classes of 40 pupils each if there was 100% attendance.

The alternative perspective for nursery schools is as shown below.

Table 7:

<table>
<thead>
<tr>
<th>Alternative</th>
<th>No. of nursery schools</th>
<th>Total number of stream</th>
<th>Total pupils eligible per 2,500 people</th>
<th>% attendance</th>
<th>No. of students per stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>2</td>
<td>2</td>
<td>125</td>
<td>50%</td>
<td>63</td>
</tr>
<tr>
<td>b</td>
<td>2</td>
<td>2</td>
<td>125</td>
<td>50</td>
<td>42</td>
</tr>
<tr>
<td>c</td>
<td>1</td>
<td>4</td>
<td>250</td>
<td>100</td>
<td>63</td>
</tr>
<tr>
<td>d</td>
<td>1</td>
<td>5</td>
<td>250</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>e</td>
<td>1</td>
<td>6</td>
<td>250</td>
<td>100</td>
<td>42</td>
</tr>
<tr>
<td>f</td>
<td>2</td>
<td>6</td>
<td>250</td>
<td>100</td>
<td>42</td>
</tr>
</tbody>
</table>

Perspective for Nursery Schools.

4.2.2 Primary Schools

The Town Planning Handbook (1971) stipulates that a day primary school should serve 5,000 people if it has two stream. The Nairobi Urban Study Group
(1974) also states that a primary school should serve 5000 people.

With the introduction of pre-primary streams in primary schools which cater for 5 years olds before they move to Std. one and the expansion of the primary schools to include Std. 8, the population eligible for primary school has been greatly increased.

This new approach to education is expected to develop the moral, intellectual and physical characters of a person. The non-formal aspects of the system are aimed at developing skills in an individual which hitherto had been neglected.

From the population analysis we find that the population from age 5 to 14, which is the population eligible for primary in 1986 was 70,897.

In 1986 there were 604 streams in the primary schools in the Municipality with about 50 students per class. There were 27,718 students attending primary school. Pre-primary classes are not established in most primary schools thus if we disregard the pre-primary population we find that 39% of the eligible students were attending primary
school. This low attendance can be attributed to the high school dropout, estimated at 3% per year per class by Sifuna (1986) especially in upper primary mainly in the rural parts of the Municipality. Early pregnancy has been postulated as one factor for this phenomenon.

The government aims at Universal Primary education for all by 2000 A.D. However we must also remember that some people do not 'enjoy' formal education. But with the introduction of non-formal education in primary school and free-education, it is expected that most students can now develop their craftsmen skills without the worry that the education they are getting is useless. It is expected that more students will attend schools since there is "free"-primary education and they can study subjects other than grammar. To pre-empt this expected increase in attendance it is necessary to evaluate the consequences in the provision of primary schools.

In a population of 5,000, given that 28% of the population is eligible for primary education, we would expect 1,400 children. If we had a 90% attendance then 1,260 would need to be catered for at present. On average a class has 50 students
though originally classrooms were built for up to 45 students. However, new classes are being constructed for 50 students, and this will be the basis for this evaluation.

We would therefore need 28 classrooms for 1400 students. Each stream has classes from preprimary to Std. 8, thus a total of 9 classrooms per stream. We would thus require a three-stream primary school for a population of 5000.

The alternative perspectives for primary schools are shown below.

Table 8:

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>No. of schools</th>
<th>No. of streams per school</th>
<th>Total student eligible (at 90% attendance)</th>
<th>Total population</th>
<th>No. of student per class</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1</td>
<td>3</td>
<td>1260</td>
<td>5000</td>
<td>47</td>
</tr>
<tr>
<td>b</td>
<td>1</td>
<td>4</td>
<td>1260</td>
<td>5000</td>
<td>35</td>
</tr>
<tr>
<td>c</td>
<td>1</td>
<td>2</td>
<td>1260</td>
<td>5000</td>
<td>70</td>
</tr>
<tr>
<td>d</td>
<td>2</td>
<td>1</td>
<td>1260</td>
<td>5000</td>
<td>70</td>
</tr>
<tr>
<td>e</td>
<td>1</td>
<td>4</td>
<td>1960</td>
<td>7000</td>
<td>54</td>
</tr>
<tr>
<td>f</td>
<td>1</td>
<td>5</td>
<td>2520</td>
<td>10000</td>
<td>56</td>
</tr>
</tbody>
</table>

Note: Each stream = 9 classrooms.
Perspective for primary schools.
If we wanted to reduce the schools we could have one primary school for 10,000 people as shown in alternative (f). This would cater for dropouts especially in the higher classes. If we had a primary school for 7,000 people, alternative (e) would be applicable. The existing schools have on average 50 students per class and this alternative has a population per class like existing trends. It also reduces wastage of classrooms due to dropouts at higher levels.

4.2.3 Secondary schools

There are currently 15 secondary schools within Kisumu Municipality with a total of 737 students in "A" level and 4,778 in "O" level.

The Government policy that 85% of the students be absorbed in secondary schools at district level has great implications for Kisumu. It means that it is must be able to absorb most of it's students.

Another factor to consider is the 8.4.4. education system. Secondary schools have an "A" level stream which is expected to prepare students for University education. The working party on the second University (1982) found that this system has
several weaknesses. "A" levels have tended to overproduce Arts students since it is cheaper to maintain on Arts stream but at "O" level the distributions between Arts and Science subjects is more or less the same. Areas with no "A" level streams had little chance of getting their students into the University thus they tended to lag behind, so it is argued.

It is on this basis that the analysis shall look at the provision mainly of "O" level classes since in three years time the "A" level classes will have been phased out. But it shall be necessary to look at the expected drop out from the formal education system of the secondary school graduates.

From the sample, it was found that 13% of the students in secondary schools were in schools in the district, 30% were in schools within the province but outside Kisumu district, 15% were in schools in district outside Nyanza Province, and 40% were in schools within the Municipality. With the implementation of the Government policy of 85% absorption of students by local schools, the municipality will have to absorb an extra 112% of existing students.
In 1986 there were about 36,000 students eligible for secondary schools upto "O" level. Therefore we see that only 13.3% were catered for leaving a big majority uncatered for. An increase of 112% in intake will mean that about 5,300 students have to be absorbed. Therefore as per this year the municipality has to absorb 10,153 students.

Between 1973 and 1983 the growth rate for students going to secondary schools in the municipality has been 6.27%. This has been attributed to the expansion of schools and the construction of new ones. However this growth rates is far below the town's growth rate of about 8% per annum. Thus we see that we either have to reduce the growth rate of population or increase the rate construction of schools.

There has been a tendency for the rural community to drift into the schools in the town. This is shown by the distribution of population of secondary school age. There migrants put more pressure on these limited facilities.

From the sample survey of schools, it was found that 16% of the students come from outside the municipality. This percentage is increasing as the
The trend of migration continues. The growth rate of 6.27% in the secondary school population absorbed in Form One has been a result of the need to absorb students who have passed their C.P.E. (now K.C.P.E.) exams. Assuming that this growth rate continues then secondary school population would take the trend below.

Table 9:

<table>
<thead>
<tr>
<th>Year</th>
<th>Eligible students from total pop.</th>
<th>Annual school pop. increase (by Form One) cumulative</th>
<th>Population in School</th>
<th>% of eligible pop. in school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>35,712</td>
<td>1,737</td>
<td>5,153</td>
<td>14.43</td>
</tr>
<tr>
<td>1989</td>
<td>44,613</td>
<td>2,085</td>
<td>7,630</td>
<td>17.10</td>
</tr>
<tr>
<td>1992</td>
<td>55,731</td>
<td>2,502</td>
<td>9,156</td>
<td>16.4</td>
</tr>
<tr>
<td>1995</td>
<td>66,980</td>
<td>3,003</td>
<td>10,987</td>
<td>16.4</td>
</tr>
<tr>
<td>1998</td>
<td>77,982</td>
<td>3,604</td>
<td>13,189</td>
<td>16.9</td>
</tr>
<tr>
<td>2001</td>
<td>89,457</td>
<td>4,325</td>
<td>15,828</td>
<td>17.7</td>
</tr>
</tbody>
</table>


Thus we can see that the percentage absorbed in secondary schools will take a constant trend if the present rate of expansion is maintained. It is therefore necessary to not only increase the rate of expansion to meet the growing demand, but to expand the
secondary schools so that more students may be able to get some form of secondary education and thus increase the population with secondary education. This is crucial in the provision of skilled man-power for economic growth and development.

The expansion of secondary schools is expected to absorb 85% of students who qualify in Kisumu thus a need to cater for about 10,000 students. This is 28% of the total eligible students.

The T.P.D. handbook (1971) states that one secondary school should be provided for 25,000 people. Kisumu with a total population of 240,000 should therefore have 10 secondary schools.

However, if 30% of the students who are eligible for secondary education are absorbed then the Municipality would need more schools as shown below as per 1986.

Table 10:

<table>
<thead>
<tr>
<th>No. of streams (Cumulative)</th>
<th>Students per class</th>
<th>Number of schools 2 streams</th>
<th>3 streams</th>
<th>4 streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>216</td>
<td>50</td>
<td>27</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>240</td>
<td>45</td>
<td>30</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>270</td>
<td>40</td>
<td>34</td>
<td>23</td>
<td>17</td>
</tr>
</tbody>
</table>

Secondary School Demand as per 1986
From the sample survey the population eligible for secondary schools was 14.88% of the total population. In a population of 25,000 people, therefore, 3,720 would be eligible for secondary school. If 30% were to be absorbed in a secondary school, we would need several streams. Thus a population of 25,000 people would result in the following distribution of streams.

Table 11:

<table>
<thead>
<tr>
<th>Students per class</th>
<th>No. of streams</th>
<th>Number of schools</th>
<th>1 stream</th>
<th>2 streams</th>
<th>3 streams</th>
<th>4 streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>22</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>25</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>28</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Perspectives for Secondary Schools

Therefore we see that the only case where we can have one school for 25,000 people is when it has four streams with 50 students per class.

At present only 4.2% of the population is in secondary school. The population of secondary school going age makes up 14.88% of the total population. We thus have to consider what happens to 10.68% who are not absorbed in secondary schools.
4.2.4 Post Primary Education

The Gachathi report (1976) which was prepared by the Committee on Education Objectives placed a lot of emphasis on providing basic primary education which would help the school leavers to be self-employable. This policy recommendation was not realised until the Presidential working part on the Establishment of 9 Second University (1982) recommended the 8.4.4. education system. This report set the pace for changing the entire education system in Kenya.

The aim of this basic education is to enable a primary school graduate to develop skills that make them self-employable. However, most of the skills taught in the primary school are rudimentary. Most of the students finish their primary education before they reach 15 years of age. They are still not mature enough to undertake self-employment activities.

It is thus necessary to provide post primary education to cater for those youngsters who do not get places in secondary school.

From previous analysis we find that over 27% of children who sit for K.C.P.E. are not absorbed in secondary schools. As years go by, this figure
accumulates and we now have a large population who are young and have only rudimentary knowledge of craft skills.

Kenya's economy is structured such that people with formal education struggle to get employment due to the advanced technology and relatively high capital ratio. Formal education is not geared to producing people with knowledge and skills which are job specific thus one has to adopt to fit into any job that is available. Primary school graduates are the worst hit because their education is geared to advancement into secondary schools and not for employment purposes. The 8.4.4. education system has attempted to bridge this gap but emphasis is still placed on theory.

The non-formal education (N.F.E.) is expected to trim this widening gap. In Kisumu, Kisumu Technical school has been redeveloped to train primary school leavers who do not expect to continue with formal education as technician. But it cannot absorb more than 100 students who graduate annually from Std. 8.

The students who manage to get additional training are at an advantage in establishing their own employment ventures.
It is with the aim of providing these youth with greater ability to be self employed that it has been found necessary to establish a post-primary education centre for developing skills other than theoretical education.

Youth polytechnics which have tended to be rural-based in Kenya are a response to the need for N.F.E. It aims at giving primary school leavers skills, understanding and values which will make them able to look for money making opportunities where they live and to contribute to development by building up the economic strength of their community (N.A.I.D. 1974).

The Youth Polytechnics seem to fulfill the needs of the Std. 8 graduates who want to develop their skills further. It would therefore be necessary to establish a youth polytechnic which is able to absorb at least 30% of these graduates who do not get places in secondary schools. This will allow for evaluation to see if it is necessary to expand or reduce such a polytechnic.

If a Youth Polytechnic caters for 30% of Std. 8 graduates who are not absorbed in secondary schools and Kisumu Technical Institute, then it shall need to cater for 150 students per year. A two year
course would thus imply that a total of 300 students would have to be catered for. Perkins and Cocking (1951) state that a workshop of about $120 \text{ m}^2$ should accommodate about 30 students. Thus if one workshop for 30 students is provided, thus such a polytechnic would need 10 such workshops but this can be reduced to 6 workshops of 50 students each, if they are expanded to $160 \text{ m}^2$.

4.2.5 Post Secondary Education:

The only such institution in Kisumu is Ramogi Institute of Advanced Technology (RIAT) located in the northern part of the municipality; it serves students from all over the province and other areas.

There is no Teacher Training College in the Municipality. Siriba College in Maseno serves Siaya district, parts of Western Province and Kisumu district. However with the establishment of a T.T.C. at Bondo in Siaya, Siriba has been left for Kisumu district and Western Province.

However with the District Focus strategy, it is necessary that Kisumu be self-sufficient in its planning and growth strategies. In this respect Kisumu Municipality is considered by the researcher as
an autonomous district due to its spatial expanse population and unique characteristics, including its rapid growth.

Out of the total 720 teachers in Kimumu 4.4% were untrained. This figure might increase if staff development programmes do not keep pace with the expansion in primary school. The ratio of trained teachers to students in primary is 1:40.

If this ratio is to be maintained then teachers population increment will be as shown assuming a 90% attendance.

Table 12:

<table>
<thead>
<tr>
<th>Year</th>
<th>Students in primary school</th>
<th>(A) Ratios of 1/40 Total no. of teachers</th>
<th>(B) Ratio of 1/50 total no. of teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>82,317</td>
<td>2,058</td>
<td>1,646</td>
</tr>
<tr>
<td>1996</td>
<td>113,513</td>
<td>2,838</td>
<td>2,270</td>
</tr>
<tr>
<td>2001</td>
<td>148,933</td>
<td>3,723</td>
<td>2,979</td>
</tr>
</tbody>
</table>

Teacher/Student Ratio

Alternative (B) is related to the present trend of 50 students per class. It is also less costly to implement.
However alternative (B) would mean that teachers will have to handle 8 periods a day. This is reality means that they shall have no free periods in which to prepare lessons, mark books, and other activities related to their jobs. It means that they have to encroach on their private time.

A ratio of 1 teacher for 40 students means that each teacher will have 32 periods per week. This leaves him with 4 periods (2 hrs. 40 mins.) in which to organise his work. It is thus necessary to aim at maintaining the present ratio of 1 teacher to 40 students and if possible reduce it.

It shall be necessary to increase the number of trained teachers by 3,723 by 2000 A.D. If this target is to be achieved then as from 1988, teachers should be increased at about 266 per year. This assumes that the present staff does not retire.

Assuming that the rate of training teachers is constant as has been since 1982 with an average of 11,300 teachers in T.T.C.'s in Kenya (Statistical Abstract, 1984) then we can reasonably assume that the same number retires every year. This would make up 11% per year.
Therefore the projected retirement of teachers for Kisumu would be as shown below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of Teachers</th>
<th>Population Retiring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>2,058</td>
<td>226</td>
</tr>
<tr>
<td>1996</td>
<td>2,838</td>
<td>312</td>
</tr>
<tr>
<td>2001</td>
<td>3,723</td>
<td>409</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>947</td>
</tr>
</tbody>
</table>

Teacher demand

It shall therefore be necessary to add the population of retiring teachers to the general increase of teachers so as to maintain the level of 40 teachers per student. Thus by 2001 A.D. Kisumu shall require 4,670 teachers. It will therefore be necessary to train 334 teachers per year.

A two year course, college of upto 700 students should therefore be established in the Municipality to cater for it's needs in terms of teacher training. This college can be expanded as future needs require.
4.2.6  University and other Higher Colleges:

The Act which caters for University education allows for the establishment of private universities. In planning for education it is necessary to be prepared for such an eventuality.

Kisumu as a regional centre offers a very good social, economic and infrastructural network that would allow for an easy establishment of a University. The Town Planning Handbook (1971) suggests a college for 250,000 people. This proposal estimate may be too low for a country where about 2% the population end up in the University. Thus in Kenya with its present 20 million population University education would have to cater for about 20,000 people. This figure will increase with time.

There are four Universities in Kenya distributed as shown in Map 3.

We therefore see that the coastal region and western Kenya do not have any University Colleges. Mombasa has a Polytechnic which cater for high skilled technical manpower. Kisumu on the other hand has no such facility yet it serves a vast region and has a great potential for producing skilled manpower for
the region. It on this basis that education planning in Kisumu should allow for the establishment of a University when it becomes necessary.

Future establishment of a University, Public or Private should move away from concentrating them at the National Capital. If such a strategy is adopted it is highly unlikely that the arid northern provinces will be a strategic location. Unless there is a deliberate policy to locate universities away from urban centres then Kisumu in the long term offers a good location. It will provide facilities for the students, teaching and supportive staff. It also could provide housing for non-resident students thus reducing cost incurred in accommodating all students.
References:


5.0 URBAN DEVELOPMENT AND EDUCATION

5.1 Residential Development and Places of Work

Residential development is related to location of schools. It is these residential areas that determine the number and size and location of education institutions especially nursery and primary schools.

This is so because the majority of students in these institutions have to walk to and from school daily. To allow them to reach their schools in time without getting unnecessarily tired schools have to be located within a reasonable walking distance from the residential area. This distance is estimated at 0.25 to 1 km. This also depends on the age of the student. Younger children walk slower and get tired faster so it is necessary that nursery schools be located about 0.25 km. from the residential area.

The study looks at the density of housing in the main built-up areas of the Municipality. In the low density areas plots average 0.25 hectares thus giving an average density of 25 to 30 persons per hectare. This area occupies 7% of the residential land in the town.

Medium density housing is generally of about 130 persons per hectare. These include mainly the Municipal Council estates.
In the high density slum areas the density varies depending on the developer. But on average people live in densities of about 1,200 persons per hectare. This figure is based on the survey which indicated that on a 0.25 ha. plot upto 50 dwelling units of one room each would be constructed housing an average of 3 people per unit. Such a high density is not bad in itself. The problem is the construction distribution. There are no storied buildings thus coverage can be upto 80%. There are no spaces for children to play and the congestion leads to stress, squalor and many other related problems. Yet these high density areas house about 60% of the Municipality's urban population.

Education not only starts at home but continues at home after school. The child ought to have an atmosphere that enables him to continue developing skills that he has learnt at school. It is for this reason that it is necessary to have proper housing for the child. Housing gives a sense of well being and helps build a healthier society.

If the density of 1,200 persons per hectare is maintained, it shall be necessary to build storied houses for these people. However storied houses are costly to build. Kisumu Municipality still has land that can allow for a more dispersed settlement for the next decade or so.
BARRIERS AND CONSTRAINTS TO DEVELOPMENT

PLANNING FOR EDUCATION IN KISUMU MUNICIPALITY

SCALE: 1 CM = 1 KM

MAP 12 M.A. THESIS
However to determine the distribution of these settlement it is necessary to evaluate the relation of residential areas and places of work including Municipal and Government officers, industrial and commercial areas.

The trend of development of these areas especially for low income workers who are unable to afford the cost of public transport, on a daily basis to work, will determine the location of residential areas.

Government offices and Municipal offices have tended to remain near the town centre. However a few Ministries have been moved to Nyalenda-Milimani area. But this development does not substantially affect the residential development.

Commercial development along the Kakamega road and the Kibos road have greatly attracted housing along these growth corridors.

This trend is going on at such a rapid rate that by 1986 25% of the urban population was living in this area called Kondele and Nairobi area which extends into Mogoso and Manyatta areas.

Wholesale, Retail, Restaurants, Bars and Hotels
which make up most of the major formal employment sector in this Manyatta-Kondele-Migosi-Nairobi area, employs about 8.6% of the working population in Kisumu. However this sector has acted as a stimulant to the informal sector. Thus it is a common sight to find open air garages, vegetable and fruit sellers, fish mongers and such self employment ventures that generate income to the people in the area. This informal employment leads to the growth of the employment sector. This in turn acts as a "pull" factor in-migration to the urban area.

The new migrants are generally unable to find affordable accommodation in the middle or low density residential areas. This leads to the rapid expansion of the high density residential slums. It is necessary to control this development so as to determine provision and distribution of schools.

5.7% of the working population is employed in construction work. Most of the construction work is undertaken in Manyatta and Nairobi area. This area is developing as a mixed density residential area. There are new estates being constructed off the Kakamega road. Middle and high density housing is also being developed off the Kakamega and Kibos roads. To improve this area the World Bank has put up markets,
water points and tarmacked roads. This has raised the value of the land and thus the construction of higher value housing has been stimulated. This area seems to be developing as a middle income residential area as the low income people are pushed to areas where the land values are lower, and site and service schemes being constructed nearby in Migosi.

The rents of permanent houses are generally unaffordable for the urban poor. It is necessary that a policy that caters for such people be initiated. This would allow them to also enjoy decent housing and raise their standards of living. It would discourage squatter settlement and allow for a better provision of facilities such as schools.

A revision of building by-laws would greatly improve affordability of housing for the low income workers who earn less than 1,500/- per month. These people make up 52% of the workers in the formal sector of employment. There is also a large number employed in the informal sector.

Development of industry along the Busia road and Kibos area is expected to stimulate development in these areas. They will probably house industrial workers and the people who provide service to them.
It is however difficult to rate the industrial growth at this juncture because industrial development in Kisumu is subject to several factors which are beyond the scope of this study. But suffice to say that development will probably continue in these areas because the land is level, there is access by road and rail, land values are low and there is provision of other support infrastructure such as water.

Income distribution was adjusted by the researcher by 20% to take into account the revision of salaries by the Ramtu Commission. The calculation were based on data from the statistical abstract, 1984. Thus the income distribution is given as follows:

<table>
<thead>
<tr>
<th>Income Range</th>
<th>% of Working Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>Below 1,499</td>
</tr>
<tr>
<td>Middle Income</td>
<td>1,500 - 2,999</td>
</tr>
<tr>
<td>Upper Income</td>
<td>Above 3,000</td>
</tr>
</tbody>
</table>

Income Distribution in Kisumu.

The percentage of upper income workers is attributed to the large number of Indian businessmen who run most of the commercial and industrial businesses in the town.
The other category are the top civil servants who work in the provincial offices.

The provincial headquarters function of the Municipality is enhanced by its regional dominance. These large organisations such Cotton Lint and Seed Marketing Board, Lake Basin Development Authority among others have their regional offices in this town.

In the provision of residential housing, incomes determine affordability thus housing developers should construct housing which are within the means of the town's residents.

Residential densities will possibly be higher along the Busia road corridor. Low density housing will continue to expand in the Kanyakwar and Mogosi areas

Medium density housing will be expected to develop alongside the high density areas. Thus in proposing the location of schools, the density of residential areas will play an important role.

5.2 Public Transport in Kisumu

Here the concern is mainly with transport as it relates to the transportation of school children.
At present there is no public transport that can cater for the school children. The only form of public transport are saloon cars that carry several people in the front and back seats and only transport a small percentage of the population at any given time.

A public transport for school children has to be frequent, regular and safe. The schools along the Jomo Kenyatta Highway are located adjacent to the residential areas where the students live. Students risk crossing roads several times a day to and from school. From the police traffic records it was found that accidents on this road had increased from 11 to 22 between 1985 and 1986.

This road also has a substantial volume of traffic with about 21 vehicles per minute on both carriageway. This traffic will continue to increase as development increases in the town's centre thus necessitating safety measures.

The conference on Traffic, Transportation and Urban Planning report (1981) noted that a school bus is available for a certain period before classes begin so that the primary goal is to optimise the route of the bus so as to serve the students best.
It is normally necessary to determine the sequence of stops as well as the capacity of the bus. One is also expected to consider the waiting time of the students at the stop as well as the travelling time and exit time. At some stops the bus has to turn to continue and this increases running time.

The distribution of schools has thus to be planned on the basis of accessibility to public transport. Apart from the nursery schools which are best located at the neighbourhood level, primary and secondary schools tend to be more diverse in their catchment though attempts are always made at serving the local population first. It is a fact that when a school tends to perform well at national examinations, it attracts people from outside the neighbourhood. These migrant population normally uses public transportation so it is necessary to locate a school as near as possible to a bus stop and vice-versa.

It is important to note that the routes are mainly for school bus operation though they could serve a multiple purpose of ferrying commuters to and from residential areas.

School bus operations are expected to start from dawn upto 8.30 then from 12.00 to 2.30 p.m. and from 4 p.m. to 7 p.m. These are the times when most
children need the transport. The assumption that has been made is that most of the school bus users are secondary school students. Assuming that 50% of the students use public transport then in a neighbourhood of 5,000 transport for secondary school students would need to cater for 630 students.

It must be noted that students get on and off the bus as it moves along a given route, thus it is logically assumed that these cancel each other and thus it is not necessary that different buses for each neighbourhood be established.

It is necessary to serve as many areas as economically possible thus in this study the population densities has been used to determine which areas need a greater coverage. In the northern parts of the Municipality land has already been acquired for residential development. Thus it is expected that these areas, though they have a high density will continue to develop faster than the rest of the municipality. The network of buses here would thus have to be denser to serve the expected population. To the east the black cotton soil deters any near future development thus the rest of the bus routes will be concentrated to the west of the Municipality where
more long term development is expected. Each route should have a running time of 30 minutes. The speed of the bus will then be determined by the distance to be covered but should not exceed 60 km. per hour with one minute in every bus stop. The distance between the bus stop is assumed to be not more than 0.5 km.

5.3 Neighbourhood Planning for Schools

Planning for schools as part of a neighbourhood is aimed at providing the facility for the student at a close range and for providing the neighbourhood with focal point as a community.

In this study neighbourhoods will be looked at as they relate to primary and nursery schools.

A neighbourhood of 5,000 people would support a 3 streamed primary school of 47 students in each class. A neighbourhood of 7,000 people would support a 4 streamed school of 54 students per class.

In the former case we would need five such neighbourhood schools to support 2 to 3 streamed secondary school. In the latter case we would need three such neighbourhoods for a 2 to 3 streamed secondary school.
The different neighbourhood sizes can be used with a 7,000 people neighbourhood for high densities and 5,000 people neighbourhood for medium and low densities. This will cater for the distance that students have to walk to the school. A high density residential development will also imply that housing is more compact and thus the unity is not lost as would be the case in low and medium density housing with an equal size of neighbourhood.

Figure 3 gives indications on how such a neighbourhood would be designed in the areas which are still unbuilt. This is however only a guideline and different formats can be applied depending on the location. In an area with a density of 130 people per hectare. A school located at the centre of a neighbourhood would ensure that no student walks for more than 0.5 kilometre.

Providing one school for less than 5,000 people would result in too much land being used for schools and this in effect would inflate the cost of development. Provision of schools should be undertaken in such a way that it allows for future expansion as the population densities rise.
Fig 2:

Possible Neighbourhood Design.
5.4 Land Requirement

5.4.1 Residential:

It is necessary to determine the residential land requirement so as to determine the expected residential distribution.

In this study three housing densities have been adopted as follows:

<table>
<thead>
<tr>
<th>Housing density</th>
<th>Psn/ha</th>
<th>% of total pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low density</td>
<td>50</td>
<td>10%</td>
</tr>
<tr>
<td>Medium Density</td>
<td>150</td>
<td>30%</td>
</tr>
<tr>
<td>High Density</td>
<td>300</td>
<td>60%</td>
</tr>
</tbody>
</table>

The low and medium densities have been increased from the existing trends of 30 and 130 respectively. This is because of the high costs of urban land and the need to conserve as much of it as possible.

The land requirement for housing could take the trend below:
### Table 16 (a)

<table>
<thead>
<tr>
<th>Density</th>
<th>Persons per ha.</th>
<th>Population 1991</th>
<th>Land Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>50</td>
<td>34,777</td>
<td>695.5</td>
</tr>
<tr>
<td>Medium</td>
<td>150</td>
<td>104,330</td>
<td>695.5</td>
</tr>
<tr>
<td>High</td>
<td>300</td>
<td>308,661</td>
<td>1,028.9</td>
</tr>
</tbody>
</table>

2,419.9

### Table 16 (b)

<table>
<thead>
<tr>
<th>Density</th>
<th>Persons per ha.</th>
<th>Population 2001</th>
<th>Land Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>50</td>
<td>62,928</td>
<td>1,258.56</td>
</tr>
<tr>
<td>Medium</td>
<td>150</td>
<td>188,784</td>
<td>1,258.56</td>
</tr>
<tr>
<td>High</td>
<td>300</td>
<td>377,568</td>
<td>1,258.56</td>
</tr>
</tbody>
</table>

3,775.68

Land requirement for housing (in ha.)

5.4.2 Commercial, Industrial and Public Purpose

In every residential neighbourhood not less than 10% of the land shall be left for public purpose. Commercial land is difficult to quantify. However every neighbourhood should reserve 10% of land for shopping facilities. However in the Kondele area a commercial centre is growing rapidly. With the expected relocation of the Country bus station to this area activities are expected to increase
substantially. This area would thus be best developed as a district centre since it has already an in-built mechanism to grow. Other districts centres could be established as the town grows to reduce congestion at the town centre.

Industrial land has been reserved in the Kibos area and Otonglo area. These areas will attract residential housing as they develop. Thus in allocation of the residential land it is imperative that they be distributed near the industrial area.

In the short term it is necessary to determine which areas are most likely to be required as industrial land. The Municipal Council has acquired land near the Kibos area. It would therefore be much easier for a developer to set up industry in this area. The land is flat and has good transport network including a railway line. Land near it is also being developed for residential housing thus a nearby supply of labour. Thus land for industry should be allocated if need be in this area.

5,4,3. Nursery Schools

It is the trend that as people work longer their incomes level increase thus they move to high income low density residential areas. Most of the
Plate 5: This Church Nursery is one of the few Nursery Schools that has sufficient land for development.

Plate 6: Aga Khan Nursery: A Private Nursery School of good quality.
time they tend not to have children of nursery going age. Only a small percentage have such children. It is on this basis that land requirement for nursery schools in these areas is less than in medium and high density residential areas.

It is expected that 2 nursery schools per 2,500 people would be adequate. This would require land-for an estimated 125 students per nursery school. The Town Planning Handbook (1971) has estimated that each student requires 0.00304 ha. (30.4 m²). Therefore the total land requirement for a nursery schools each with a population of 125 pupils is 0.38 ha.-

To cater for contingencies such as rapid increase in population in the medium and high density areas the larger estimate of 250 students for 2 nursery schools should be used thus a total land requirement of 0.7 ha. (0.38 ha. per school).

5.4.4. Primary Schools

In determining land requirement for a primary school one has to consider the requirement of the 8.4.4. education system.

In the syllabus students are expected to learn Agriculture and Workshops and laboratories are also
needed for practical lessons. In this land estimate it is assumed that a school has 3 streams.

Savage (1965) established that 2.6m$^2$ is reasonably adequate per student in an elementary laboratory. One can therefore approximate that one would need a laboratory or workshop of 130m$^2$ for 50 students.

Each class in the upper primary is expected to use the workshop for three periods a week. The same case applies to laboratories. The total number of periods required for each facility is 36 hours per week. There are 40 periods a week each lasting 40 minutes. Therefore we see that one laboratory and one workshop would be adequate for a 3 stream primary school.

The increase in the school population due to Standard 8 classes and preprimary classes means that each school will require more land for school buildings.

One solution would be to build storied classrooms or alternatively classes could be built compactly as shown by the diagram below and plates 7 and 8.
Plate 7: Compact arrangement of school building in Kisumu.

Plate 8: Arina Primary: Note the storeyed building in the centre background.
These alternatives are appropriate for schools in built up areas where land is already limited.

It is estimated that in a well arranged class which is strictly for instructions, each student needs some $2.5m^2$ space (Perkins and Cocking, 1951). In a class of 50 students we would need $125m^2$ for a classroom. In a three streamed school the total area needed for classrooms would be $3,375m^2$. If storeyed classrooms were built the space required would be $1,687.5m^2$.

Each school is estimated to require 34 teachers at a ratio of 1 teacher per 40 students. If each teacher had $2.5m^2$ for actual writing and the total staff need a room for conference then the staff room would have to be twice the size of a classroom ($250m^2$). However if the staffroom and offices were built as part of the storeyed blocks then there
would be no need for extra space.

At present only standard 6 to 8 study agriculture. In a three stream school the total population studying this subject would be 450. If each class was given a plot of $\frac{1}{2}$ ha. then a total of 1.5 ha. would be required for agriculture per school.

With a plot coverage of 60% the buildings would cover a total of $6,473 \text{m}^2$ assuming no storied building. But with storied buildings this figure would be reduced to $3,243 \text{m}^2$.

The policy on education aims at developing the physical and moral well being of a child. In this respect sufficient space should be left for recreation. To reduce the cost of construction and acquisition of land it would be possible to construct 3 classrooms with panel doors which could be opened to be used as an assembly hall.

The playing field caters for games like football, netball, volleyball and athletics. To reduce wastage of land these playing grounds ought to be arranged as compactly as possible. Below is a schematic representation of a possible arrangement.
Thus a minimum field of $20,000m^2$ (2 hectares) is required if all the above games are to be accommodated. However an extra 1 ha. should be added for other possible games such as lawn tennis, hockey. Thus the total land requirement for a conventional school would be 5.2 ha. for non-storied and 4.8 ha. for storied buildings.

5.4.5 Secondary Schools

In a four streamed school, there would be a total of 16 classrooms requiring a total of $1,600m^2$ since each student requires $2.5m^2$. If a single storied building was constructed then $800m^2$ would be required. Giving a 60% plot coverage then $2,667.0m^2$ would be required for conventional classroom and $1,337m^2$ for storied classroom.
Savage (1965) Perkin and Cockin (1951) estimate that students need $5m^2$ for laboratory work at this advanced level. This allows for specialisation of design of each laboratory for Biology, Chemistry and Physics. Thus the total space requirement for these laboratories would be $600m^2$ and $1,000m^2$ at 60% plot coverage.

Metal and woodwork laboratories also have to be built since at this higher level the work is more detailed, more space would be required for each student. A home science laboratory is also needed for training students in the basics of home-science.

Not all students take these subjects so provision of these facilities should assume that part of the class takes up each of the subjects.

Thus a workshop for either woodwork, home-science or metal work, allowing for more circulation of space and demonstration area would be constructed to accommodate 30 students.

Perkins and Cocking (1951) estimate that a workshop of $136m^2$ would satisfy the above requirements. Thus three laboratories for woodwork, metalwork and home-science would need a total of $680m^2$ at 60% plot coverage.
It is estimated by Perkins and Cocking (1951) that an administration block should not take more than 10% of the classroom area. Thus an administration block would require 267m$^2$.

The same amount of land for games applies here as in primary school. Agriculture at this level is optional. If 60% of the students were to opt for agriculture then 2.4 ha. of land would be needed assuming each student has a 50m$^2$ plot. This allows for both crop and animal husbandry. The total land requirement per school would therefore be 6 ha. and 5.6 ha. with storied buildings.

5.4.6 Youth Polytechnics

A Youth polytechnic with a population of 300 students would need 6 workshops for 50 students each. It is estimated that a workshop for 50 students each, assuming each student has 5m$^2$ space, would cover 250m$^2$. Six such workshops would need 1,500m$^2$.

If the administration block occupies 10% of the total workshop space one would require 150m$^2$ for administration.
Youth polytechnics, like any other education institution requires playground, assuming that there will be no great expansion in the future of youth polytechnics and since they have a relatively smaller population than schools, it would be appropriate of 2.5 ha. were reserved for playing grounds.

Thus the total land requirement for a youth polytechnic would be 3.8 ha. allowing 1 ha. for future expansion.

5.4.7 Boarding Facilities

This is determined by the number of students who will be expected to a board. The size of the dormitory also depends on the bed type used by the school i.e. decker beds or single beds. Therefore each school has to determine the capacity.

However a 7m$^2$ cubicle can accommodate 2 to 4 students depending on the bed-type. If a storeyed dormitory is built then less space will be occupied by the dormitory facilities. Thus we would need 2,800m$^2$ as maximum space for sleeping excluding the toilet and dining facilities. However a 3 storeyed building would reduce this space to 933m$^2$. At 60% coverage we would need 4,666m$^2$ for a conventional dorm
and 1,555m$^2$ for storeyed dorm. To allow for dining facilities, matrons houses, and other services this area should be expanded to 1 ha.

Staff housing is normally taken as part of the residential neighbourhood but where necessary staff houses should cover 1,400m$^2$ per house. This allows for cheaper provision of facilities and services. Houses can be built as semi-detached or storied to conserve land.

Since staff members in a boarding school act as surrogate parents to students it is necessary that staff housing be built in a boarding school as part of the schools development.

5.4.8 Colleges

These are function specific and in determining the land requirement, it is necessary that a detailed curriculum be provided for evaluating the requirements. Each is a planning project in its own right.
References


CHAPTER SIX

CONCLUSION AND RECOMMENDATION

In the whole study, the strategy was to highlight issues of supply and demand of education facilities and how they relate to residential land use, urban growth and population.

Where it was not possible to get concrete data the researcher gave general guidelines in so far as he felt that they were relevant in forwarding a case for education planning.

Attempts were made to concentrate on land use planning but at the same time incorporate policy decisions in so far as they affect the land use planning.

Provision of schools will have to be undertaken in stages as the town grows. For nursery schools this is a possible strategy.

Table 17:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Nursery school</th>
<th>Total No. of streams</th>
<th>Total students eligible per 2500 p</th>
<th>No. of students per stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>2</td>
<td>3</td>
<td>125</td>
<td>42</td>
</tr>
<tr>
<td>2001</td>
<td>2</td>
<td>6</td>
<td>250</td>
<td>42</td>
</tr>
</tbody>
</table>

Provision of Nursery Schools: Short and Long Term.
If the policy of universal education at primary level by 2000 A.D is to be achieved then the council must develop schools at an equal rate with the increase in demand.

Each primary school should have three streams of classes, a home science laboratory and a workshop. The streams of classes could be increased to four as the school grows to cater for a neighbourhood of 7000 people.

30% of the students who pass K.C.P.E. have to be absorbed in secondary schools. Below are the possible strategy of school structure depending on the neighbourhood. The figures are for a population of 25,000 people.

Table 18:

<table>
<thead>
<tr>
<th>Students per class</th>
<th>No. of classes required</th>
<th>No. of schools 2 stream</th>
<th>No. of schools 3 stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>22</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>45</td>
<td>25</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

School type strategies.

The emphasis of basic education in primary school creates a cadre of primary graduate who need
further training to develop their rudimentary skills.

Thus Youth polytechnics could be established in the Manyatta and Nyalenda areas this is because these areas have over 50% of the urban population and they are generally poor and unable to pay the exorbitant fees needed for private secondary schools. The informal sector also thrives in these areas and would thus be developed. Recurrent expenditure can be reduce if the students are encouraged to construct and repair furniture and buildings.

Staff development should be seen as a core issue in education planning thus the need to establish a Teacher Training College. This will also go a long way in ensuring that the Municipality is self sufficient. It will also bolster its role as a regional centre. Thus a T.T.C. producing 334 teacher per year.

Establishment of a University or diploma colleges in Kisumu is highly probable due to regional and strategic location. With the renewal of East African Co-operation the town will continue to expand thus exerting a greater pull for developers.
To locate a University or a College it is necessary to consider its future growth. Thus a possible area will be in the areas to the west of the town which are flat, of good stable soil and has little chance of being surrounded by high density commercial or industrial development. The area is also easily accessible by road.

Bus routes should be aligned to serve these areas including areas which have secondary schools to allow for a more equal distribution of these facilities ensuring that safety measures such as guard rails are provided where necessary for students and public safety.

Schools should be provided for neighbourhoods of 7,000 for medium and high density areas and 5,000 people neighbourhood in low density areas. This would ensure that students do not walk for more than half a kilometre.

Land requirement for education institution by 2001 A.D. will be as follows:
<table>
<thead>
<tr>
<th>Institution Type</th>
<th>Total eligible pop.</th>
<th>% intake</th>
<th>Pop. per institution</th>
<th>No. of institution</th>
<th>Area per Institution (in ha)</th>
<th>Total Area requirement (in ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Conventional</td>
<td>Storeyed</td>
</tr>
<tr>
<td>Nursery Sch.</td>
<td>72,367</td>
<td>100</td>
<td>250</td>
<td>289</td>
<td>0.38</td>
<td>-</td>
</tr>
<tr>
<td>Pri-Sch.Day</td>
<td>149,022</td>
<td>90</td>
<td>1,960</td>
<td>76</td>
<td>5.2</td>
<td>4.8</td>
</tr>
<tr>
<td>&quot; Boarding</td>
<td>149,022</td>
<td>90</td>
<td>1,960</td>
<td>76</td>
<td>6.2</td>
<td>5.8</td>
</tr>
<tr>
<td>Sec. Day</td>
<td>26,837</td>
<td>30</td>
<td>800</td>
<td>34</td>
<td>6</td>
<td>5.6</td>
</tr>
<tr>
<td>&quot; Boarding</td>
<td>26,620</td>
<td>30</td>
<td>800</td>
<td>34</td>
<td>7</td>
<td>6.6</td>
</tr>
<tr>
<td>Youth Poly.</td>
<td>62,620</td>
<td></td>
<td>300</td>
<td>2</td>
<td>3.8</td>
<td>-</td>
</tr>
<tr>
<td>Staff Housing</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>0.14</td>
<td>-</td>
</tr>
</tbody>
</table>

Education Land requirement 2000 A.D.
The following are guidelines which may be adopted by the Municipal Council to guide them in implementation of programmes and development of education institutions.

1. Parents should be made to share the recurrent and development cost of schools. But it should not be mandatory that parents construct new schools since this will force many parents not to take their children to school due to the high cost of such development, in fact higher than what parents used to pay as school fees before abolition of the fees. The council should thus adopt strategies that take cognisance of the poor parents.

2. Land should be reserved for development of boarding facilities at secondary school level in areas where residential densities will be low for the next decade to cater for students who are unable to travel daily to such schools. Since boarding schools are expensive to construct parents should be involved since their children will be the beneficiaries of such institution.
3. Staff housing should be provided for teachers especially in boarding schools to allow the staff to devote more time to students as they act as surrogate parents rather than rushing off to their houses after classes and houses which may be quite some distance from school.

4. Due to the high cost of land acquisition in urban areas and the scarcity of such land, it is pragmatic that such land be conserved as much as possible. Measures to achieve this include construction of storeyed buildings; compact buildings should be built where possible. Comprehensive schools also conserve land and provide many facilities at low costs. Students also get a sense of belongings since they continue learning in the same school up to fourth form. Development cost is also shared between many more parents thus easing the burden.

Each neighbourhood has a population of between 5,000 and 7,000 people. The table below shows the distribution of these facilities per neighbourhood.

**Table 20:**

<table>
<thead>
<tr>
<th>Pop. Catchment</th>
<th>Nursery school</th>
<th>Primary School</th>
<th>Secondary School</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>4</td>
<td>1 (3 streams)</td>
<td></td>
</tr>
<tr>
<td>7,000</td>
<td>6</td>
<td>1 (4 streams)</td>
<td>1 (4 streams)</td>
</tr>
<tr>
<td>12,500</td>
<td>10</td>
<td>3 (3 streams)</td>
<td>2 (4 streams)</td>
</tr>
<tr>
<td>25,000</td>
<td>20</td>
<td>5 (streams)</td>
<td>5 (4 streams)</td>
</tr>
</tbody>
</table>

A neighbourhood should have land for commercial facilities, public purpose and schools, therefore for the neighbourhoods proposed the following land requirements would be necessary assuming commercial land took 10% and public purposes 20%.
Table 21: Areas in hectare

<table>
<thead>
<tr>
<th>Neighbourhood pop.</th>
<th>Residential</th>
<th>School</th>
<th>Commercial</th>
<th>Public purpose</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density</td>
<td>5,000</td>
<td>100</td>
<td>6.72</td>
<td>13.34</td>
<td>26.68</td>
</tr>
<tr>
<td>Medium Density</td>
<td>7,000</td>
<td>46.7</td>
<td>14.48</td>
<td>6.77</td>
<td>13.54</td>
</tr>
<tr>
<td>High Density</td>
<td>7,000</td>
<td>23.3</td>
<td>14.48</td>
<td>3.85</td>
<td>7.70</td>
</tr>
</tbody>
</table>

N.B. Area given for primary school is for a day school, Total land requirement in neighbourhood. Thus implementation of neighbourhood ought to be undertaken as indicated above to ensure that nursery and primary schools are made part of the neighbourhood. Secondary school can be located in a residential area with a catchment population of 7,000 and thus in such a situation 7.0 hectares should be added to the neighbourhood, as indicated above.

All in all planning at all levels must strive to be comprehensive.
LAKE VICTORIA

SHORT TERM DEVELOPMENT STRATEGY

LEGEND

- MUNICIPAL BOUNDARY
- RAILWAY LINE
- ROAD
- RIVER
- STEEP SLOPES
- BUILT UP AREA
- SWAMP
- BLACK COTTON SOIL
- RESIDENTIAL LOW DENSITY
- HIGH & MEDIUM DENSITY
- COMMERCIAL
- INDUSTRIAL
- PUBLIC PURPOSE

PLANNING FOR EDUCATION IN
KISUMU MUNICIPALITY

MAP 14

M.A. THESIS
URP
BIBLIOGRAPHY


2. Bareither, H.D. (1968) University Space Planning: Translating the educational program of a University into physical facility requirements, University of Illinois, Press, Urbana.


24. Liew Kok Pupu, M. Workshops in Secondary Schools, Singapore, UNESCO Regional Office for Education in Asia and Oceania, Bangkok.


Appendix 1

Household Questionnaire

1. Questionnaire No. 
2. Estate 
3. Interviewer 
4. Name of Respondent 
5. Relationship to Household Head 
6. Total Number in Household.

<table>
<thead>
<tr>
<th>Relationship to Household Head</th>
<th>Age</th>
<th>Sex</th>
<th>School being attended Name and Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. How far is the nearest nursery school
   How far is the nearest primary school
   How far is the nearest secondary school

9. Place of Origin of Head of Household:
   a) Kisumu Municipality
   b) Kisumu District
   c) Siaya District
   d) South Nyanza District
   e) Kisii District
   f) Western Province
   g) Others (specify)

10. What are the reasons why you live in Kisumu

11) How many rooms are occupied by your family

12) What is the average size of the rooms
### Appendix 2

**Traffic Count Schedule (Jomo Kenyatta Highway)**

<table>
<thead>
<tr>
<th>Time: From</th>
<th>To</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Buses</th>
<th>Trucks</th>
<th>Matatus</th>
<th>Cars</th>
<th>Others specify</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>