A STUDY TOWARDS AN UNDERSTANDING OF RURAL HOUSING PROVISION AND REQUIREMENTS FOR SIAYA DISTRICT

BY

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B.A. (Land Economics)

A Thesis submitted in partial fulfilment

for the degree of Master of Arts in

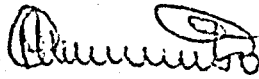Housing Administration in the

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DECLARATION
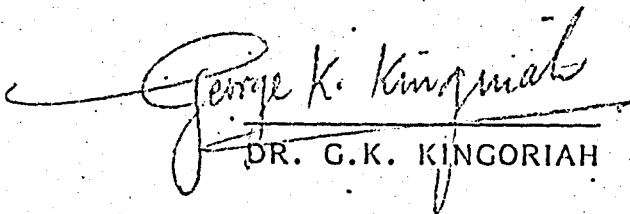
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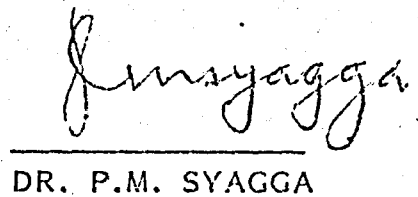
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ABSTRACT

This thesis constitutes a study of rural housing provision and requirements in Kenya, with particular reference to Siaya District. The study developed from a statement of the problem that there is inadequate housing in rural areas of Siaya District. It is, however, not known with any precision what is the immediate cause of this state of affairs. This study therefore set out to investigate the possible causes of housing quality, and examines the problems of providing decent housing in rural areas in the light of the locally available building materials, and available human and economic resources. The study is therefore not a comparison of the various houses but an examination of the problems associated with rural housing conditions.

In measuring the housing quality, the study used multiple linear regression analysis, in which the housing quality measured in points was the dependent variable, with various factors such as income, age of the house, building materials, household size etc. were independent variables.

It is noted that the provision of proper and decent housing in the rural areas of Kenya is and will remain a big problem for a long time to come. Housing in rural areas tends to be dismissed as a low priority issue. This is due partly to the fact that shelter construction, improvement and maintenance are viewed as semi-automatic self help processes taking place in homogeneous setting under no constraints in terms of land, availability of local building materials,

building skills, financing, and of course legislation.
Designing rural settlements within the African traditional
architectural context, using improved indigenous (or
traditional) building materials after careful studies of traditional
built environment and knowledge of the logic behind it, can
be a great achievement to the government. It is true that
some people in the rural areas can these days afford to
build semi-permanent or permanent houses and thus, neglect
the use of indigenous materials. The problem however is that
there is increasingly high cost of building materials and lack
of regular income by people in the rural areas. Rural housing
should be such that majority of people living there can afford
it by utilizing the locally available traditional construction
materials and skills at minimum cost.

There are three parts to this study. The first section
comprises the introductory chapters covering the general
introductory formalities of the study. It sets the premise
against which the housing conditions in Siaya District is
examined. This section reviews concepts as they relate to
rural housing, i.e. house form determinants, african architecture,
and determinants of housing need.

The second part of the thesis consists of two chapters.
There is a chapter giving background information on the housing
development process in Kenya and the various roles played
by National Housing Corporation and Housing Finance Company
of Kenya (HFCK). At the moment the role of these government
agencies has been found to be minimal, particularly HFCK

in providing housing in rural areas of Kenya. The other chapter in this part examines the general characteristics of the study area, Siaya District, and the building practices. The study area portrays problems related to housing conditions and the available amenities.

The last part of the thesis consists of two chapters. One chapter provides an evaluation and analysis of information collected mainly through questionnaire administration and field observations regarding the housing conditions in Siaya District and the variables that influence the conditions. The results obtained in the main revealed striking variations in housing conditions, in terms of, building materials used, sizes of houses, age, architectural style, quality etc. in the sub-areas of Siaya District. The majority of the people use locally available building materials in providing themselves with housing. The houses are of average quality depending on the frequency of maintenance and repairs carried out. However, the proportion of houses which are inadequate is high, and this has unpleasant implications to the national housing policy of providing every household with a decent dwelling. The last chapter is a summary of the recommendations and conclusions. The conclusions are based on the theoretical concepts defined in section one and the empirical findings. It is here discussed the directions which rural housing should take. It is considered that rural housing should be an integral part of a national housing policy and not to be left to the rural households themselves because lack of a clear policy renders the achievement of housing policy objectives difficult.

W.H.A. OLIMA, 1986.

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CHAPTER I

INTRODUCTION

Problem Statement

In spite of all the material and economic progress that developing countries have been able to achieve during the postwar period, the provision of both the basic needs such as food, clothing and shelter, and essential services such as safe drinking water, sanitation, health and educational facilities still remain the principal pre-occupation of most of the developing countries in the world today. Man obtains his basic needs such as food, clothing and shelter from nature. He works with nature and uses natural endowments to get the type of shelter, clothing and food he wants; these in turn become a part of his physical environment. Among the basic needs of life, shelter leaves the most visible impact on the built environment, while at the same time its characteristics are influenced by the natural environment. In a physical sense, shelter acts as an intermediary between man and nature whereas in a social sense it acts between man and society. It involves making a permanent mark on and changes to the environment. Being a place to which man withdraws for privacy, shelter symbolizes prestige and status in most societies apart from becoming individual's identity symbol in society, reflecting not only his personality but also his technological, economic and social handicaps.

In Kenya, the basic needs are similar to those ..identified
in the developing countries except that in the case of housing
provision, it was thought that the problem of housing was
more urgent, acute and serious in urban environment than
in rural setting[1]. Housing is a subject of social importance
to all people. This is the reason why the issue of housing
is a major problem in both developed and developing countries.
One of the aims of successful planning is the provision of
decent, safe and sanitary housing in a suitable environment
for the people. The magnitude, the scope, the dimension and
fundamental causes of housing problems vary from one country
to another. In the developing countries, the magnitude of
the housing problem is greater and appears to be increasing
as the rate of urbanization and pace of development increase.
The shortage of adequate housing is prevalent in most
countries of the world. The housing problem in the developing
countries is more acute and it has reached in some countries
to a crisis level. All developing countries suffer from the
fact that a majority of their populations live in sub-standard
housing; characterized by overcrowding, lack of bathrooms,
inadequate sources of potable water, improper sanitation, lack
of services and general lack of requirements for dignified
existence. The causes of housing problems in the urban
areas of developing countries may be many, but the major ones
are high rural migration to the cities, high population growth,
unprecedented rapid rate of urbanization, lower priority given
to housing in the construction sector, and deterioration of
old houses which were built of low quality materials and were

left without proper maintenance. The accelerated population growth and migration into the towns has put a burden upon the housing agencies whose capacity is insufficient to provide an adequate supply of housing.

Despite the acute housing problem, housing has not held a high priority in the development programmes of most governments. Notwithstanding its significance to human life, housing has been regarded in many countries more as a consumption good and low priority investment item in comparison to other national development programmes such as agriculture, education, health, industry and provision of infrastructure. In comparison with agriculture and industry it has been contended that as an economic activity, housing has a lower rate of return on capital invested. Housing and other related subjects were considered to be of less importance, as they were not thought to contribute to economic growth of nations.

Because of the importance of adequate housing which is universally recognized as one of the principal factors contributing to human health, happiness and well being, and social and political stability, it is proposed in this study to look into the problems of providing decent housing in the rural areas of developing countries, with special reference to Kenya. However, it should be noted that there is no universal definition of adequate or good housing, but it is generally agreed that housing should satisfy people's way of life at a given stage in development. Therefore the provision of adequate housing for the ever-growing populations of the developing countries remains one of the major issues in the

world today.

It is significant to note that a roof on one's head is the wish of practically all human beings, whether in the rural areas or the urban centres. The nagging problem has always centred on the type of housing one wishes to build and of course the ability to pay for the construction of such a building. Gone are the days when mud-and-wattle and a thatched roof was all that was required for warmth, security and comfort of owning a house. The ownership of a decent house gives the family a degree of security in a psychological and financial sense. The present life style and level of development demands that one builds for himself and his family a good house of whatever form, and this needs money, a commodity that is in short supply.

The problem of inadequate housing has been discussed at various national and international forums. It is generally agreed that just as the poor families are often unable to obtain adequate food and clothing, so they are also unable to obtain adequate shelter. It is estimated that about 1,030 million people of the world's population, be they urban or rural, are suffering from inadequate shelter. For example, over the whole of the earth there are, according to the United Nations, 800,000,000 peasants – one third of the population of the earth – now doomed to premature death because of their inadequate housing[2]. According to the United Nations, the world population in 1980 totalled approximately 4.4 billion and 74% of this population (3.3 billion people) currently live in inadequate housing with most rural households lacking access

to water and sanitary facilities, while urban households are
often crowded into improvised housing in the growing slums
surrounding cities. By the year 2000, world population is
projected to be 6.1 billion; by 2025, it will reach 8.2 billion,
with 82% living in developing countries which are faced with
housing problems. Providing adequate housing for this growing
population is a major challenge for policy makers in these
countries.

   During the recently concluded conference on UN Decade
for Women 1985, it was reported that inadequate shelter had
become one of the most critical issues facing the world today.
The Swedish Minister for Migration Affairs and Equality between
Men and Women asserted that women and children make up
a quarter of the world's population lacking adequate shelter,
and that an estimated 15 million people died unnecessarily every
year of disease directly linked to inadequate shelter, water
supply and waste disposal[3]. Addressing the same conference,
the Executive Director of Habitat, Dr. Arcot Ramachandran
agreed with the sentiments expressed above when he reported
that women and children constitute a large majority of the
world's population who lack adequate shelter and are forced
to live in unhealthy and unsanitary conditions in neglected
rural settlements and urban slums. This majority was therefore
the most vulnerable to health hazards as they suffer from
severe shelter problems and live in the poorest and most unhealthy
settlements[4].

   The very identification of the housing problem assumes
a comparison between the actual state of housing condition
and the desired state as expressed by the national housing
objectives. Every country has the general housing objective

of providing her population with adequate housing relevant to the needs of each family, rural and urban. In the Tanzania Second Five Year Development Plan1969-1974, rural housing was given high priority and decent housing is one of the most important objectives in the efforts to raise the quality of life in rural areas, and thereby reduce the gap between urban and rural areas. The National Housing and Building Research Unit (NHBRU) from the start emphasised the rural housing problems in order to contribute to the development in rural housing design, utilization of local materials and products, construction and housing methods, and the promotion of housing skills[5].

In Nigeria, about 70% of the population whose housing problems have been accorded very low priority in national planning,, are rural dwellers. One of the government's policy statement is that every Nigerian has a right to adequate, healthy and habitable accommodation. In fact, various governments of Nigeria budgeted about $4.5 billion under the 1975-1980 Development Plan Period for various housing units all over the country and even a greater amount under the current plan period[6].

A survey conducted by the Institute of Development Studies, Mysore, India, reveals that in many Indian villages, nearly half of the existing houses are in need of urgent repairs. The bulk of the rural people comprising peasants, labourers, and craftsmen, live in extremely bad conditions. About 750 million of them, one fifth of humanity,

constituting the poorest among the poor of the world, live

under leaky, makeshift, wormy roofs and suffer the absence

of such elementary services as latrines, safe water supply,

roads, and transport. As many as 7 out of 10 homes in the

rural areas of developing countries are currently so unsuitable

for human habitation as to require replacement or major

alterations[7].

The overwhelming majority of the rural population in

the developing countries is currently living in seriously

deficient housing, community facilities, water supply and sanitation[8].

In many cases, a serious housing problem is caused by a few

deficient features for example, leaking roofs and contaminated

drinking water, in the context of otherwise satisfactory dwelling

conditions. Several reports and observations have alluded

to the poor conditions of rural housing and community facilities

as being the most important causes of poor health of inhabitants

in these areas.

In Kenya, the housing problem which exists in the

rural areas, in terms of inadequate shelter, is becoming

recognised as both social and economic in nature. Adequate

housing should provide shelter, privacy, comfort and psycholo-

gical identity. As already pointed out, housing problem is

identified as the existing gap between the actual housing

conditions and the desired state of housing consistent with the

country's national development objectives. The desired state

of housing in Kenya is contained in the National Development

Plans. Every National Development Plan since 1970 has stressed

the government's prime objective in housing in full recognition
of housing's strategic role in improving living conditions and
raising the nation's economic performance. It is stated that:

> The prime objective of government policy in
> housing is to move towards a situation where
> every family in Kenya will live in a decent
> house, whether privately or state-sponsored,
> which provides at least the basic standards of
> health, privacy and security[9].

In the housing policy, Kenya Government considers a
decent home as having minimum requirements of two habitable
rooms, constructed of permanent materials, with separate kitchen
and basic sanitary facilities such as toilet and shower compartments.
The space requirements are as laid down in the Building Code,
constituted by the Local Government Adoptive Building By-Law,
while the density requirements are determined by the Physical
Planning[10]. In rural areas of Kenya, it has become difficult
to come up with a design and proper definition of what a decent
house should look like because of the various socio-cultural forces.
In house design there are two general principles that can be
applied in the rural areas. A family can build one large house
for all purposes or build several smaller houses for different
purposes e.g. separate kitchen building, separate houses for each
wife, separate houses for grown-ups boys etc. In rural areas
many activities take place out of doors as the pattern of daily
life in Africa allows for little time to be spent in houses.
The traditional use of houses has been only a place to sleep,
prepare and partake of food during rainy weather. This
traditional use of house has not terribly changed as far as --

the use of rural houses is concerned. The activities that have to be accommodated include sleeping, meeting and resting, taking meals, reading and writing, preparing and cooking food. In Siaya District, the practice has been to have separate building as kitchen for the purposes of preparing and cooking food, and even as sleeping place for small girls. To make a house as useful as possible, rooms for sleeping should be large enough to be used for other purposes such as storage of household items. As there is no absolute rule concerning the minimum area per person in sleeping rooms, the desired number of rooms for sleeping naturally depends on the number of household members and the size of the rooms. The local customs concerning who can share a sleeping room with whom, and the tradition of not allowing older sons to sleep in the same house as their father has to be considered.

In the light of the above considerations (including the traditional practices), a housing model 1 considered adequate as having minimum shelter standards in rural areas of Siaya District is a three-roomed house constructed using mud and wattle as walling material and plastered using sand-cement screed with corrugated iron sheets as the roofing material. All this should be accompanied by a pit latrine for sanitation purposes. Such a house should be belonging to a family of man, wife and children and should be the main house excluding kitchen. Therefore a three-roomed semi-permanent house with pit latrine is considered in this study as being adequate and acceptable living quarters satisfying minimum conditions of shelter for the purpose of measuring the housing need for

the district. Adequate house is therefore a function of 3 rooms, mud and wattle wall construction, sand-cement wall surface treatment, cement screed floor finish, corrugated iron sheets roofing, and pit latrine.

While the Kenya Government believed in the provision of proper and good shelter for all, it has been pointed out that many wananchi are living in "substandard and unhygienic" temporary shelter due to the high cost of building materials and shortage of traditional material. . The housing problem, inadequate and often substandard housing in Kenya, would be exacerbated because the number of people requiring shelter is rising faster than the country's ability to provide new homes. The houses in the rural areas are said to be still in deplorable condition[11]. However, in the rural areas, the problem has continued to be the quality of the housing rather than the actual shortage of dwellings. It is a fact that some rich people in rural areas have not used their wealth to put up decent houses and instead put up good corrugated iron roofed garages for their cars while they themselves lived in grass thatched huts[12]. Rural households continue using traditional materials such as mud and wattle for wall construction, and thatch for roofing which with lack of traditional skills deteriorate at a faster rate thus requiring frequent replacements. Most of the rural houses with leaking roofs, cracking walls and dusty floors are appalling, even by the most minimal standards of health and hygiene. This compared to the desired standards of housing makes them to be of poor quality.

In Kenya, like other developing countries, the rural housing conditions are poor or of low standards. The poor rural housing conditions can be attributed to the government's general policy which is geared towards the improvement of the urban environment rather than rural environment. As early as 1964, it was recognised that Kenya was experiencing a serious housing problem, particularly in its cities. The United Nations Mission to Kenya on housing concluded that there was no specific data on rural housing, but widespread observation indicated that the houses were of very low standards[13]. The problem, however, was the question of priorities for the use of the available funds for housing hence the relative urgency of a housing programme for Kenya's urban areas. Since about 85% of Kenya's population is rural and the economy is still largely agricultural "rural housing is mostly self-built and much of it is poor, due to lack of information on beneficial techniques and knowledge of use of indigenous materials"[14].

In Tanzania, according to Christer Svard[15] rural housing is characterised by "very low cost because the economic context of the housing situation is such that most families have very low cash incomes; self-help; and local materials". Despite their very low incomes and the simple techniques and materials at their disposal, many inhabitants of rural areas have developed a form of housing that is fairly adapted to the local environment.. Rural poverty usually precludes the replacement of even a single component of the dwelling to minimise housing deficiency.

The problem of rural housing is not only of staggering magnitude but of great complexity involving various issues such as building materials, construction techniques, attitude to change in living environment and the economic capacity to sustain improvement. This is because the very large numbers of persons living in seriously deficient housing in rural areas will grow as the population grows, even if the rate of migration from rural to urban areas rises. Considering the rural housing conditions, it would be fair to say that generally there is no quantitative but qualitative housing problems in various communities of the world. But while stressing the significance of decent housing as being beneficial both to the individual families, and finally to the nation as a whole, there are certain factors that may militate against this becoming a reality in Kenya today. It should be realized that commitment to the eventual fulfillment of basic housing needs is not enough. That commitment must be combined with sober realism and practicality if progress toward this fundamental objective is to be sustained. It is unrealistic to believe that all members of a country's population can be provided in one step with dwellings that conform to standards of industrialized nations. Rather, the process of meeting housing needs must be viewed as incremental, and it must begin with the establishment of realistic housing standards that will be affordable both by housing occupants and by society at large.

The Significance of the Study

The need for this study arises because there is little known about the factors that influence the housing conditions in the rural areas. This gap in knowledge means that policy makers would fail in their duties as they cannot provide necessary advice regarding housing provision in rural areas. There is ample evidence from studies carried out in Kisumu District that there is a weak relationship between housing conditions and the holding size of farms in terms of hectares[16]. When housing conditions were subsequently related to on-farm income and total household income, there proved to be a slightly better, though still weak relationship. This makes it clear that good housing conditions are seldom if ever the result of a single year with a high income, but rather related to accumulated income over a certain period of time in relation to the income level and the subsistence needs of the household.

A study of this nature can only serve as the beginning of a contribution to the general understanding of what it means to talk about improving the quality of rural housing. As opinions and evaluations concerning the existing rural housing situation and priorities for improvement have not been studied, the data from this study is hoped would be useful in the need for the intensification of rural housing research particularly with the government's new policy of District Focus for Rural Development.

In many developing countries there is need to establish
suitable, reasonably simple data investigation to help in determining
factors that affect the provision of decent housing in the rural
areas. There is, therefore, an urgent need to undertake
a study that would look into the rationale of government
intervention through policy measures providing analysis and
assessment inorder to create rural-urban balance, and end
the qualitative housing problem in rural areas. The study
is hoped to make a significant contribution to the knowledge
of rural housing conditions in Kenya and policy changes that
may help in solving the housing problem. The recommendations
made from this study would help the government in deciding
on how best to go in financing rural housing, while the data
collected would be useful to the people of Siaya District in
deciding on the best ways of improving the conditions of their
houses.

The Hypothesis

There is no definite hypothesis because of the
generalized and exploratory nature of the contextual scope
of the study. However, with reference to the nature of the
above stated problem regarding rural housing situation, the
study aimed at investigating the validity of the following
observations:

1) That the poor rural housing conditions in
   Kenya exist because of the government's
   general housing policy;

2) That the poor quality of rural housing in
   Siaya District is caused by the low incomes;

3)   That the people's attitudes and housing
      perception is responsible for the existence
      of the poor quality housing in the district
      as compared to the housing model
      developed;

4)   That the available building materials such
      as poor soils types causes the poor rural
      housing conditions in the district; and

5)   That housing condition is not simply the
      result of physical factors or any single
      causal factor, but is the consequence of
      a whole range of socio-cultural factors.

The Study Objectives

The primary objective of this study was to carry out
a survey of housing conditions in the rural areas of Siaya
District to determine the method of housing provision in the
area.   The study therefore attempted:-

I)   to determine the quality of rural housing
      by carrying out an assessment of the
      conditions of the existing houses and
      comparing them with a model for rural
      house;

2)   to investigate, establish and verify the level
      of housing requirement and need in the district.
      The question to be answered here is whether or
      not there is need for housing improvement
      in the area;

3)   to identify the problems and bottlenecks
      confronting the local people in their
      struggle to provide decent housing.
      This was an attempt to gain insight
      in current housing problems in the
      development of the rural areas;

4) and finally try to come up with recommendations
and proposals on how the problems can be solved
through which the government can improve
her performance in the area of rural housing
policy, programmes, and research. This will
include suggesting if possible policy actions
necessary for the improvement of rural housing
conditions in the district.

The Study Assumptions

While carrying out the study, it became necessary to
make the following assumptions:-

1) The basic assumption of this study was that
there is need to improve the housing conditions
in the rural areas for the benefit of the people.
This assumption is based on the premise
that every family should live in a decent home
as already described and as stipulated in
Kenya's national housing policy. For the
purposes of this study, a decent house is
one having at least three rooms, either
semi-permanent or permanent and a pit latrine.

2) Secondly, it was assumed that income is a
significant determinant of the type of housing
that can be afforded by people.

3) Thirdly, it was assumed that the physical
environment has an impact on the social,
economic and physical well being of man.
Hence the necessity to strive into analysing
and understanding the general physical,
social and economic characteristics of the
study area.

4) Fourthly, the person to be considered for
improvement was assumed to be interested
in the changes to be brought about;
otherwise it would be futile attempt on the part
of the government trying to advocate for

such a change.

5) Lastly, the complexity of housing
problems necessitates the consideration
of many different parameters such as
land, finance, legislation, technology
and political priorities which have to
be assessed and weighted in search for
solutions. The solving of such multi-
parameter problems should proceed in
three major stages namely, the
identification and analysis of problem;
the synthesis of the components of
solutions; and the testing of results
against their expected performance.

The Choice of the Study Area

The study area shown in Fig. 1 is Siaya District, in
Nyanza Province of the Republic of Kenya. The district covers
2,523 square kilometres of land with a total population of
474,516 people, giving population density of 188 persons per
square kilometre[17]. The necessity to carry out the study
of rural housing in Siaya District arose because of the following
considerations:-

1) There have been statements expressing
disappointment concerning the state of
housing in the district. For instance,
on August 15, 1979 and on other various occasions,
the President deplored the poor state of rural
housing in the district. The President
advised members of the community including
those working outside the Province to return
to their respective homes, construct good
houses and participate in farming[18]. The
state of housing therefore needed improvement.

2) Familarity and general observation made during
preliminary surveys revealed that the general
housing conditions in the area is poor like in
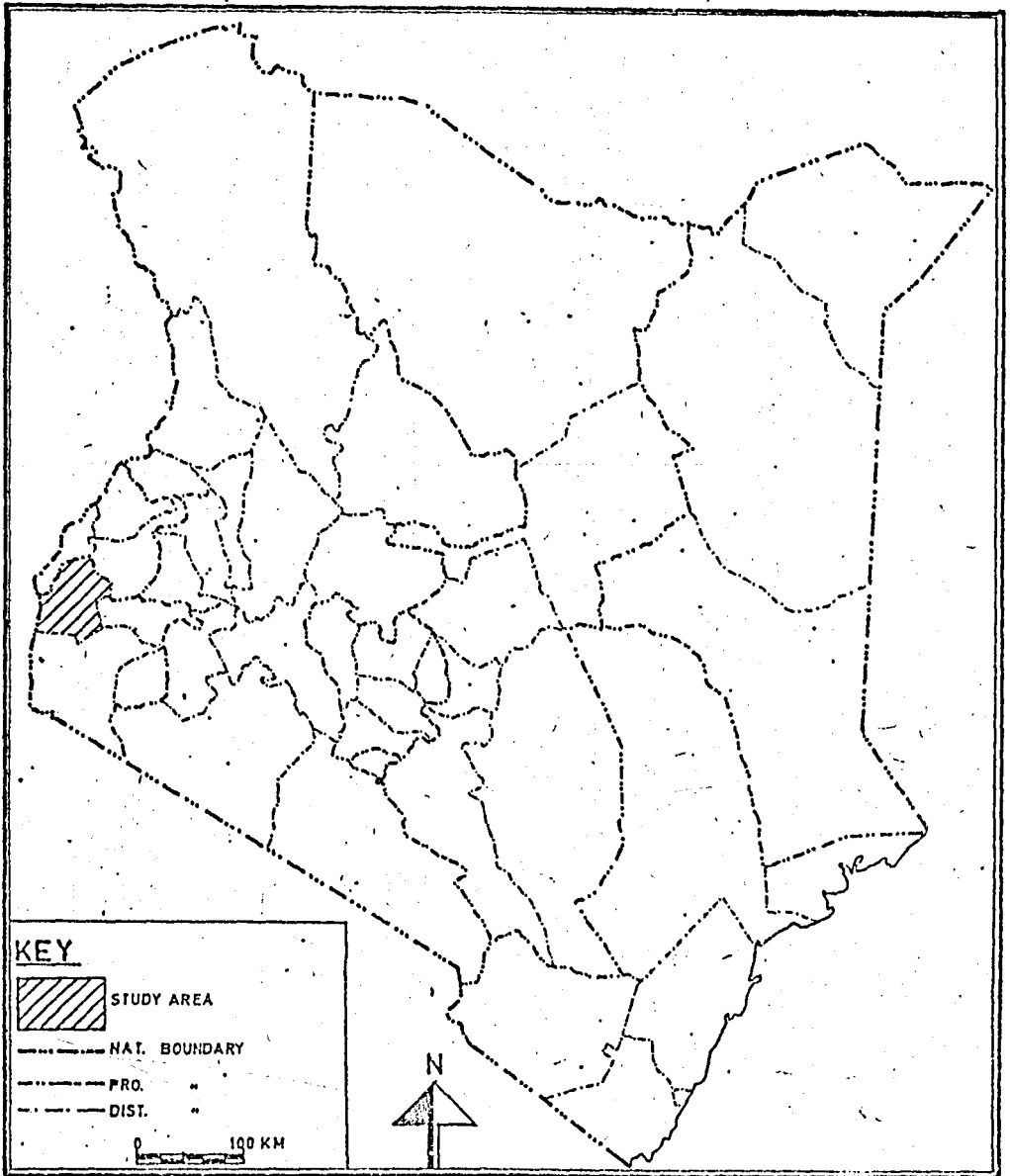
Fig. I - Map of Kenya showing the Study Area, Siaya District.

other rural areas. It should however
be noted that although there is no
general housing shortage in the
district, there now begins to be
local shortages of such building
materials like bush poles and thatch.
Hence the need to investigate possible
alternative approaches to housing
provision.

3) There is the likelihood of increased housing
demand not only in Siaya Town but also in
other three divisional administrative centres of
Yala, Ukwala and Bondo with the district's
projected population and the implementation
of the new strategy of District Focus for
Rural Development. As already pointed out,
Siaya District has a total population of
474,516 according to 1979 population census, out
of which only 4,022 persons within Siaya
Town could be considered urban population
basing on the figure of 2,000 people that are
normally deemed to constitute an urban area,
according to Kenyan planning practice.

4) This district has a great deal of varying
economic activity structure and heterogeneous land
uses. The economic activities include farming,
and fishing along the comparatively harsh
conditions in the drier lake shore areas. The
district suffers from very low incomes because
of the economic activity. The low incomes in
the district can be explained in terms of lack of
employment opportunities. From the District Data
sheet records for the year 1982, the total farm
crop earnings gave an average income per capita
of Kshs. 616.78[19].

The above stated considerations caused the need to investigate possible alternative approaches to housing provision and how the people of Siaya District rank housing among other necessities, i.e. housing perception among the people in the district in terms of their aspirations regarding housing conditions favourable to them.

The Scope of the Study

As stated in study objectives, the study comprises a general housing survey noting the locally available building materials, construction methods and technology, the general housing conditions, architectural form, the available amenities such as water availability in terms of source, and sanitation facilities, and inquiring into the methods of housing provision in rural areas. The study covers some topics which would appear ostensibly peripheral to the actual housing problems, for example, the general characteristics of the study area such as the physical environment and the socio-economic activities. The study gives the highest priority to an adequate supply of clean and safe drinking water, and to hygienic sanitation because these two items, along with a satisfactory diet, are fundamental to survival and good health; and their construction or improvement logically accompany construction or improvements in housing.

The analysis of the characteristics of the study area becomes necessary because it is impossible to create development in one sector of a society without looking into other sectors. Development in housing has to go hand-in-hand with development in other fields since development in some sectors even open up development in housing, for example, development in rural

water supply, agriculture, transporation and communication,
health institutions and manufacturing industries.   There
appeared the need to examine the levels of housing in
comparison to better economic conditions and educational
facilities.   The comparison was done concerning the need
for better water supply and adequate food to requirements
for better housing.   ·

The study also looked into the role of housing in the
overall national development, present financing of rural housing
by the National Housing Corporation (NHC) and the work of
Housing Finance Company of Kenya (HFCK) in housing
development.   Because the study is on rural housing, financing
of rural housing by NHC became necessary because a national
rural housing programme has been instituted in Kenya and
the Corporation is permitted and encouraged to promote the
financing of rural housing.   Therefore the problems being
faced by the corporation are analysed to help in providing
for alternative approaches to rural housing financing.

The study is organized into six chapters as follows:-

Chapter I covers a general introduction including the
problem statement, the significance of the study, the hypothesis,
the study objectives, the study assumptions, the choice of
the study area, the scope of the study, research methodology
and operational definition of terms.

Chapter 2 deals with concepts and realities regarding
rural housing.   It covers the review of related literature,
for example, determinants of house form, african traditional
architecture, housing conditions in rural Kenya, and

determinants of housing need.

Chapter 3 deals with the role of housing in national development, national housing policy and housing policy formulation, role of the National Housing Corporation in rural housing development, and the role of Housing Finance Company of Kenya in housing development.

Chapter 4 considers the environment, building customs and housing in the study area. It discusses the general characteristics such as population growth and its structure, land use and its potential, socio-economic set up, and outlines the general aspects of housing including amenities and services, i.e. water resources, public transportation, health and educational facilities.

Chapter 5 gives evaluation and analysis of the housing conditions in the study area.

Chapter 6 covers the conclusions and recommendations.

Research Methodology

This study started in August 1985 with documentary research and preparation of questionnaires for use during the field surveys. The documentary research involved collecting data and information from written sources available in the various libraries. University libraries offered most of the necessary information on documentary research. Public records by the Ministry of Works, Housing and Physical Planning, the National Housing Corporation, and the Housing Finance Company of Kenya provided the main sources of documentary data and information on provision of housing and matters related to it for the whole country. While looking for documentary data and information, the author conducted personal interviews and discussions with the administrative.

and other officials of the Ministry of Works, Housing and
Physical Planning and National Housing Corporation. The
discussions with the officials of the Corporation covered issues
connected with the provision of rural housing and the role
of the Corporation in housing development.

Before the actual field survey, the author made a
preliminary survey of the study area making observations
generally as to the nature of the housing conditions. Because
of the size of the area, it became necessary to sample carefully
so that the researcher is able to see all the characteristics
of the total population in the same relationship that he would
see them were he actually to inspect the totality of the
population.

Sampling Procedure

It was not feasible to make up a list of every household
head living in the district and from that list select a sample
for study through normal randomization. The sampling method
adopted for the study was stratified sampling which was thought
to be convenient, and indeed administratively necessary
in such an area. It was done on the basis of 'Crop Zones'
and rainfall patterns demarcated by the Ministry of Agriculture
and Livestock Development[20]. The study area is divided into
three zones namely; high potential; medium potential;
and the marginal zones as discussed in Chapter 4. A map (Fig.2)
of the district was secured showing political and administrative
boundaries. Population therefore consisted of three big
strata whose characteristics are similar yet whose unit
characteristics are as heterogeneous as possible, for example,
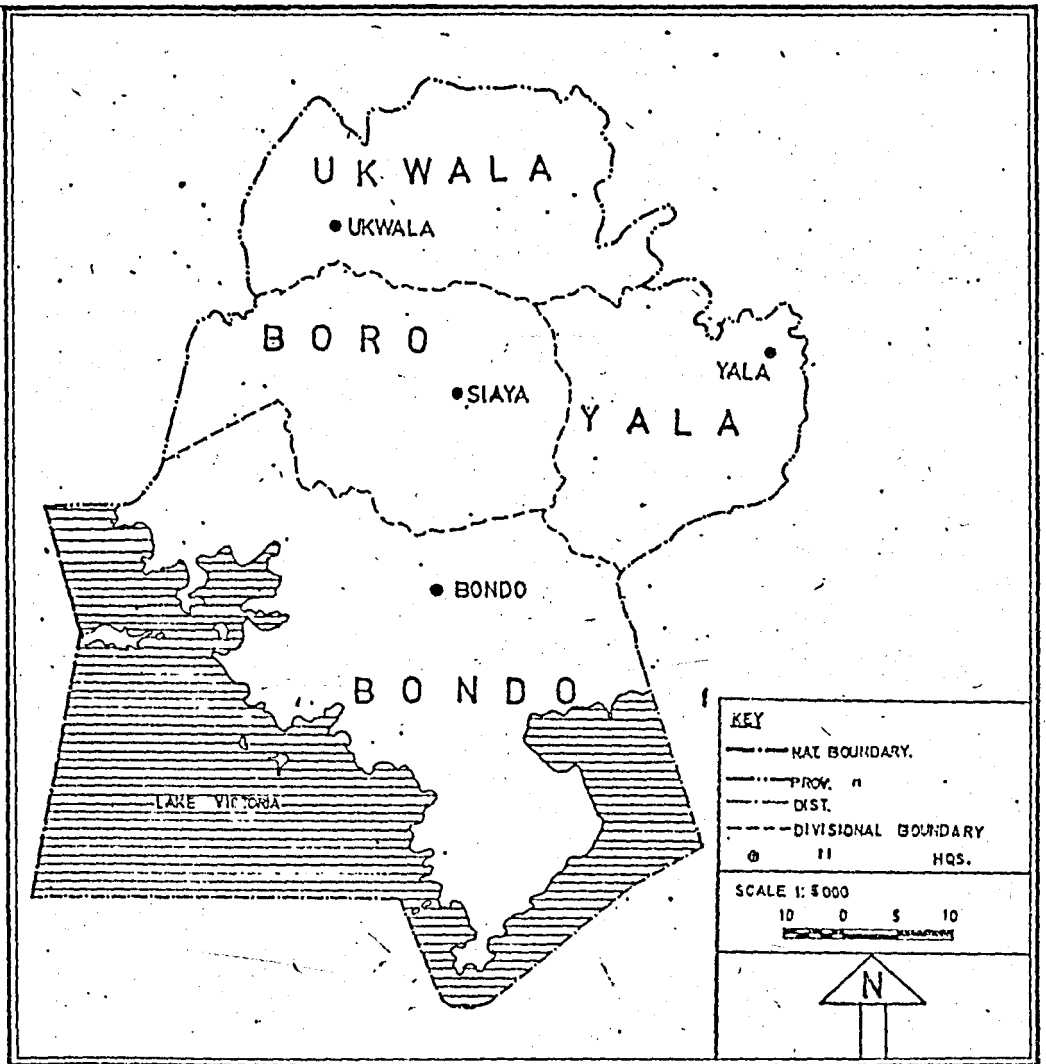
Fig. 2 – Map of Siaya District, the Study Area showing administrative boundaries.

age, occupation, income, size of the household etc. Each stratum contained many locations, different population and number of households. One location per stratum was sampled using 1979 populations. However, various sub-divisions had taken place between 1979 and 1985 in order to ease administration. Locations were taken because they had good identifiable boundaries and this also became necessary in order to reduce the distances to be travelled. for the purposes of quick counts and supervision. Each location sampled was considered on its own merit (Fig. 3).

From the high potential zone, mainly in Yala and Ukwala Divisions, Uholo location was selected. According to 1979 population census, the location had population characteristics appearing to be common to the two divisions e.g. the locations population density of 232 persons per square kilometre[21] was equal to Ukwala division's population density of 232 persons, and was approximately equal to Yala division's population density of 230 persons per square kilometre[22]. North Alego location was sampled from the medium potential zone. From the many locations in the zone, the three sub-locations making North Alego had the highest number of households, highest population and highest population density. On average each sub-location had 836.7 households[23]. At the same time, the location borders Siaya Town hence suitable for investigating the influence of town on rural housing conditions.

With the nature of the dispersed population in the marginal zone which is mainly in Bondo Division, Central Sakwa Location with the highest number of households was sampled. According to 1979 population census, the two sub-locations, Nyangoma and Migwena, forming the location had the highest number of people, 8360 persons and 5634 persons respectively[24]. The location also falls within the comparatively harsh conditions in the drier lake shore areas where economic activities have long been concentrated on lake shore. The sampling procedure was therefore stratified systematic non-probability stretching from the district, locations, villages, and house units. The district had 89,702 households[25] in 1979 out of which 1404 households lived in the trading centres of Bondo and Ukwala and townships of Siaya and Yala. A total of 500 household heads were interviewed from the three sampled locations.

Because this study was an exploratory one whose main goal is to obtain valuable insights which ultimately may lead to testable hypotheses, non-probability sampling was used in deciding where to administer the questionnaires. The interviewed persons were the ones especially in good positions to supply the needed information inorder to make generalizations about the population sampled. The selection of the interviewees was done relying on the interviewer's judgement as to the individuals to be included so long as there was equal representation from each of the sub-locations making the location.
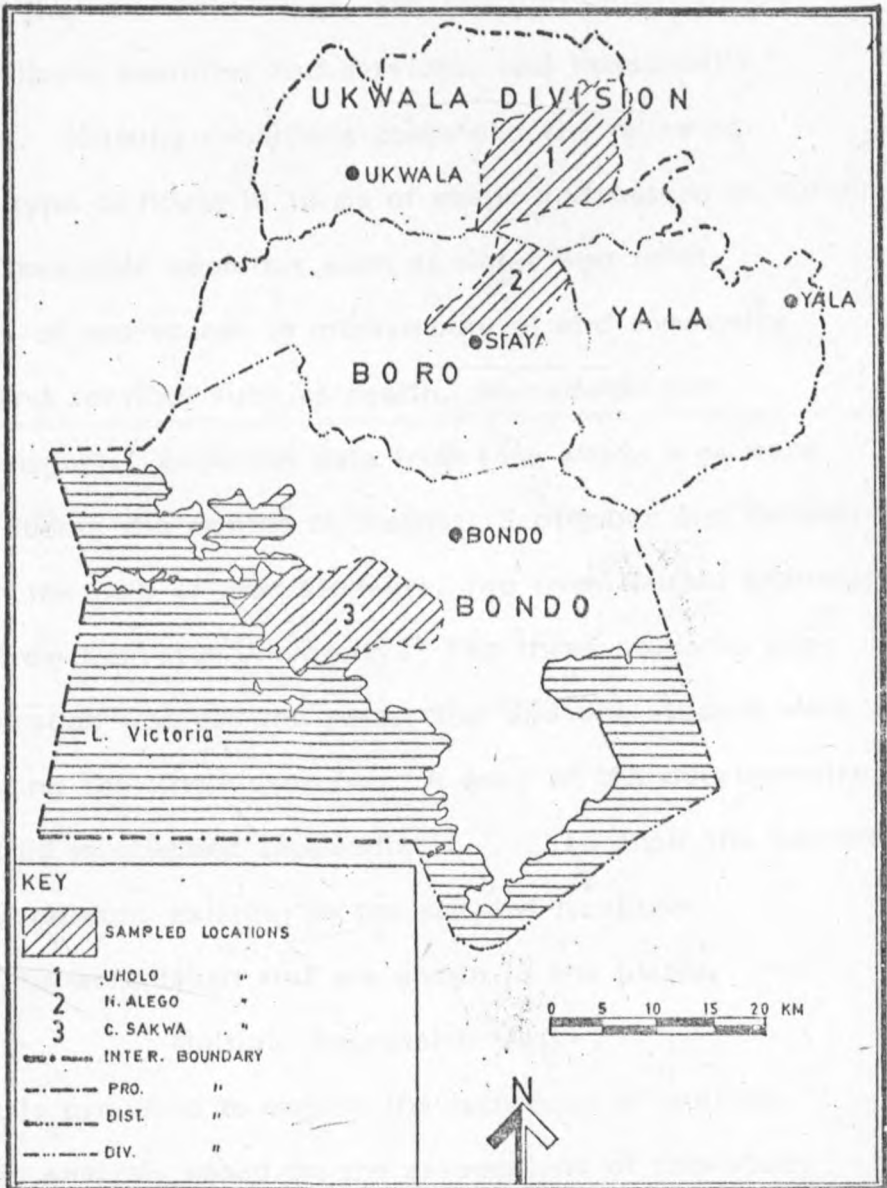
Fig. 3 - Map of Siaya District, the Study Area
showing the sampled locations.

The final work of the study and the most important
one was the actual carrying out of a field survey on the housing
conditions in the area.   The questionnaires administered were
designed in July 1985.   The questions concerned the personal
details of the household heads, construction details of the
house, available amenities and services, and household's
aspirations.   Housing conditions comprised the following
aspects: type of house in terms of shape and nature of building
materials; available amenities such as water and toilet;
availability of and access to infrastructural and community
facilities and services such as health, educational and
public transport.   Empirical data from case study area were
collected during the months of August, September and October
1985, with the help of four students, two from Nairobi University
and two from Kenyatta University.   The three students were
in each location whereas the researcher and one student were
co-ordinating the whole exercise.   A copy of the questionnaire
administered is attached (appendix 1).   To show the various
housing conditions existing in the sampled locations,
photographs were taken and are shown in the plates.

Multiple Regression Model

It is proposed to employ the technique of multiple
regression analysis based on the assumptions of this study
and a conceptual model to analyse statistical data of factors
that would determine the quality of the housing in the rural
areas.   Essentially, this study is an investigation into the
relationship between housing conditions and the various factors

that influence the conditions. The data on the dependent
variable was based on the conditions of the various aspects
of the house e.g. floor, wall and roof, and the available
amenities and services using a score system designed.
The conceptual model takes the form of a multiple regression
function expressed as:

$$Y = f(X_1, X_2, \ldots\ldots, X_n) \qquad (i)$$

Assuming that a linear relationship exists between
the housing conditions and each of the independent variables,
$X_1, \ldots\ldots, X_n$, the above function may assume the following
equation:

$$Y = a + b_1 X_1 + b_2 X_2 + \ldots\ldots + b_n X_n \qquad (ii)$$

where Y = Housing Condition

a = Constant representing minimum housing condition.

$b_1 \ldots b_n$ = Partial regression Coefficients

$X_1 \ldots X_n$ = independent variables assumed to affect
housing conditions.

The multiple regression equation is based on the principle
of linear relationship. The term "a" represents the value
of Y when $X_1 \ldots X_n$ are in each case zero. The $b_1 \ldots\ldots b_n$
indicate the effect on the dependent variable Y of a change
in the accompanying independent variable when all other
independent variables are held constant. Thus b_1 estimates
the change in Y per unit change in X_1 when all other X's
remain constant; b_2 estimates the amount of change in Y with
a unit change in X_2 with all other X values remaining fixed.
In this respect the partial regression coefficients are quite
different from the simple regression coefficients, obtained

by regression Y on only one independent variable, where effects of other variables are not controlled.

$X_1 \ldots\ldots X_n$ and $D_1 \ldots\ldots D_n$ are given as

X_1 = Income per month (Kshs)

X_2 = Wall type

X_3 = Roof Type

X_4 = Age of the house in years

X_5 = Number of buildings in homestead

X_6 = Household size

For the purposes of regression materials used for construction of the walls and roofs are represented as dummy variables, D_1 to D_n.

D_1 = Mud wattle cement

D_2 = Blocks/bricks/stones

D_3 = Mud-wattle wall

D_4 = Thatch

D_5 = Corrugated iron sheets/tiles

The data for independent variables X_1 to X_n and D_1 to D_n were extracted from the information got from the field survey.

Data Analysis

The data collected for this study has been analysed in various ways in an attempt to present meaningful results. Other aspects of the study like architectural style of the house, form of construction, condition of the house etc. were manually analysed using percentages (appendix 2). To determine the degree of association between the dependent variable and the independent variables individually or severally, a computer package namely "step-wise" multiple linear regression analysis on SPSS has been used in the data analysis for this study. In this study the 'null hypothesis' that no relationship exists between the dependent variable Y and any of the independent variables will be tested at 95% confidence limit.

Presentation of Results

The results of the information and data collected for this study is presented in written texts with data matrix tables and equations necessary in an ordered chapter format.

The researcher, however, recognizes that this study may have some drawbacks in its findings. For example, some of the interviewees were both indifferent and sometimes unwilling to answer some questions put to them particularly, ones related to number of land acreages, number of members of the household and income levels. Therefore not all the answers received may be genuinely representative of sample survey. It is also not true that all persons interviewed were necessarily heads of households.

Operational definition of terms

The need to define various terms in this study arose because terms often have special meanings in different fields. For instance, although the terms "housing", "shelter", and "dwelling" are used interchangeably in relation to all types of organized accommodation provided to protect the occupiers from the harsh climatic conditions, they can as well have special meanings. The terms dwelling, house, dwelling unit, dwelling house, residential dwelling unit, family dwelling etc. have been used indiscriminately to refer to living quarters of any type. The term "dwelling" can be limited to a housing unit located in a permanent building and designed for occupancy by one household.

The concept of "shelter" is used interchangeably with housing but in this study it embraces more than is usually conveyed by conventional terms like dwelling. Shelter refers to the total environment within which individual human families have to .live. It includes the dwelling unit and its environment, especially the facilities and services such as water, and waste disposal.

The term "adequate shelter" is frequently used in the study. The United Nations Organization concerned with human settlement. (Habitat) envisages adequate shelter to be more than better houses. Adequate shelter implies; protection from the weather elements; hygienic disposal of household and human wastes; sufficient space for health and privacy; security of tenure and/or occupation; access to employment, health and education services[26]. For the purposes of this study, shelter to be adequate must be capable of providing protection from weather elements such as rain, wind, temperature; sufficient space for health and privacy; access to sufficient safe water, and proper method of waste disposal. Adequate house is therefore a function of three rooms, mud and wattle wall construction, sand-cement surface treatment, cement screed floor finish, corrugated iron sheets roofing and pit latrine.

The term "culture" is used in the study in the same way Mabogunje[27] used it in his report. Culture is used to mean the end product of prolonged trials and errors involving the stimuli of the natural environment, social organization and technological knowhow. Cultural standards are usually

linked to the economy of each stratum of society hence the
quality of shelter can be taken as a true measure of the
socio-economic status of a person.

One of the problems in making comparisons of rural conditions
and policies in one country with those in other countries is
the variation in the definition of what constitutes a rural area.
In most cases, a country establishes a definition based on
the size or density of an "urban" population, settlement or
area. A population, area or settlement is then "rural" if it
does not fall within the urban definition. In Kenya, for
instance, urban areas are towns containing over 2,000
inhabitants, the remaining areas being defined as rural[28].
In this study the term rural population refers to the
-population of the district other than those in the townships
and trading centres. And the rural sector is taken to mean
the entire economy and the institutions of a rural area.

The term "household" refers to the arrangements made
by persons, individually or in groups, for providing themselves
with food or other essentials for living. Therefore a household
may be either a one-person household or a multi-person
household. In the integrated rural surveys 1976-1979[29],
household is defined as comprising of a person or group of
persons generally bound by ties of kinship who normally reside
together under a single roof or under several roofs within
a single compound and who share the community way of life
in that they are answerable to the same head and share a
common source of food. In the study the definition above
is used and co-wives of a polygamous husbands living within

a single compound are included in the same household as
their husband regardless of the cooking arrangements.

Another term used in this study that may not have
a universally acceptable meaning is "housing need or housing
requirements which should not be confused with housing or
housing effective demand which expresses a desire for housing
supported by the economic ability to satisfy this desire. The
concept "housing need" embraces the total requirements for
shelter, without considering whether or not families can pay
for it. Definitions of such need may be expressed as a minimum
quality of building structure required, a maximum rate of
occupancy, for example, fewer than three persons a room,
or upper limit on the proportion of income spent for housing.
Robinson[30] defines housing need as the quantity of housing
that is required to provide accommodation of an agreed minimum
standard and above for a population given its size household
composition, age, distribution and so on, without taking into
account the individual household's ability to pay for the housing
assigned to it. According to United Nations[31], "housing
requirements" (or housing needs) expresses the extent to
which housing conditions fall below the levels or norms considered
necessary for health, privacy and the development of family
living conditions. Housing need is therefore sometimes
described as a 'social' concept which is independent of economic
considerations and should represent society's view about the
quantity and quality of housing for members.

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CHAPTER 2

RURAL HOUSING:CONCEPT AND REALITY

Introduction

The problem of housing does exist in both urban and rural areas of the developing countries. In the urban areas of these countries, the housing problem is manifested in terms of shortages, over-crowding, increases in slum accommodation, rising rents, and generally unsatisfactory and unhealthy environmental conditions. In the rural areas, the housing problem is seen in terms of inadequate shelter and poor quality housing-conditions. This Chapter therefore reviews the related literature regarding provision, form and conditions of rural housing.

Providing the entire population with adequate shelter is perhaps the most pressing problem facing local communities in all parts of the world. Housing as shelter is seen as one of those 'minimum needs' which must be met if the 'redistribution with growth' approach is to succeed. Expenditure on housing in urban areas is the largest component of household's budget next to food. After the family pays for food, clothing, utilities and other essentials, there is little money left for housing[1]. It is perhaps because of the acute and serious housing problems in urban areas that resulted in a lot of studies being carried out on the best possible ways of alleviating the housing shortage in these areas which has been increasing at a rapid rate due to increase in natural population and high rural-urban migration.

It is projected that the trend will have to continue still as long as the rate of population growth continues to rise and countries lack far-sighted housing policies and careful planning.

Notwithstanding the problems of rural housing and environment there is less information on the housing conditions of rural population currently available as indicated by the World Housing Survey. There is, however, a lot of data available for urban housing conditions because housing conditions in Third World countries are usually investigated in the urban environment. This lack of attention to rural housing can be attributed to seemingly better housing situation in the rural areas as compared to the urban slums and squatter settlements[2]. On the other hand, governments still tend to neglect rural housing, not only because of lack of money but also because of its dispersed nature. For this reason, rural households too find it difficult to combine forces and put pressure on centralized government systems. However, a few countries such as Cuba, Ghana, Tanzania, Ivory Coast, India and Kenya have tried to organize rural housing schemes in an attempt to improve the rural housing conditions.

Rural housing is an important component of human settlement, which by definition is where man lives in community. Whether the community is rural or urban, its development involves a transformation of the natural environment into a man-made environment. The modification of the natural environment or ecosystem in ways which are antithetical in nature is what man calls development. The neglect of housing needs of a community leads to the deterioration of the human settlement

environment. Improvement and development of the rural areas is mankind's greatest challenge. This is the attitude of the executive director of the United Nations Centre for Human Settlements Habitat, Dr. Arcot Ramachandran. Human settlements conditions, especially in the Third World, has worsened and need correction. The "improvement of human settlements is not an isolated programme but should be integrated in national development policies and plans"[3].

Rural housing provision which is part of human settlements environment cannot, however, be treated separately from other developments in rural areas. Belated attempts to develop rural areas have been made, but these have in the majority of cases been focused on investment in agriculture and training in activities other than those related to the improvement of rural housing and provision of essential services. It has to be realised that shelter provision and associated environmental conditions are of great importance to environmental quality for human happiness. Bad housing and inadequate services results in serious environmental damage. According to A.L. Mabogunje[4], it is extremely difficult to provide good environmental conditions in human settlements in countries where the government cannot "afford to provide shelter for all its people, especially the poorer ones, and therefore it must be accepted that most shelter will have to be self-provided". Environmental problems of developing countries have generally been regarded as the results of poverty or as the consequences of the early stages of industrialization. This perception has invariably led to the conclusion that what is needed to improve the situation is to hasten the pace of

development and to pay greater regard to reducing its negative
environmental impact. Especially in the urban areas, such
negative impact is manifested in the poor housing of vast numbers
of people, the inadequacy of services, the resultant pollution
of water, air and solid wastes, and the general insanitary and
dreary living conditions. The squalid and dehumanizing conditions
in the human environments, it is implied, must be endured
by the majority of the population until the socio-economic situation
in the various countries changes significantly for the better[5].
To bring about rapid and remarkable, if not dramatic, changes
in the present human environment situation, it is argued that
a judicious review of the standards and criteria that govern
the provision of shelter in human settlements should be effected.
One reason for the relatively inefficient functioning of human
settlements in many developing countries, especially in the
provision of shelter, is the conflict between official and cultural
standards, that is, those established by legislation, by-laws,
or other rules and·regulations, and those derived from
traditional practices or found tolerable and acceptable by a
large number of people, respectively.

The provision of shelter influences the natural
environment in three ways namely; by consumption of natural
resources; by adding physical objects to the environment; and
by acting as an intermediary between man and nature. A good
human settlement is one where the housing needs of every one
are satisfied without adversely affecting the man-nature relation-
ship or the legitimate interest of other people. Aristotle once
said that happiness and safety are the main aims of cities and

other human settlements[6]. The statement rightly applies to
rural housing because a decent house in any rural area is a
source of happiness to the inhabitants and an assurance of
safety. In terms of individual families, the environmental conditions
of settlements express themselves essentially in the type of
shelter such families manage to secure. The low economic
capacity of people in the rural areas is evident in their type
of dwelling, and the construction characteristics are likely to
be determined by the availability of the building materials
provided by the local natural resources, for example, mud and
thatch. Therefore rural housing in Siaya District cannot be
divorced from the building materials that the natural environment
provide and must be treated as a component of the human
settlement. The improvement of housing quality in rural areas
should not be seen as panacea for poverty but it is essential
both for development and for improving the quality of life.
The physical environment of man, especially the built environment
has not been, and still is not, controlled by the designer.
This environment is the result of traditional architecture, and
it has been largely ignored.

This chapter is therefore organised into three sections
namely; factors determining house form; housing conditions in
rural Kenya; and determinants of housing need.

Factors Determining House Form

The listing and classification of house types and forms
have not given much insight into the processes or determinants
of the creation of form. There have been some attempts to
take a deeper and more theoretical look at the forces that

create house form, but most have been implicit rather than explicit. However, it has been pointed out that the different forms taken by dwellings are a complex phenomenon for which no single explanation will suffice. All possible explanations, however, are variations on a single theme: people with different attitudes and ideals respond to varied physical environments. These responses vary from place to place because of changes and differences in the interplay of social, cultural, ritual, economic, and physical factors.

Theories put forward to explain the form of dwellings have tended to be largely physical deterministic in nature and inclined toward a rather excessively simplistic attempt to attribute house form to a single cause. They ignore the fact that building form manifests the complex interaction of many factors such as physical, social, cultural and economic. Thus they fail to express the complexity which can be found only through consideration of as many as possible variables and their effects.

There are determinists who assert that we shape our buildings and then they shape us; that is, shelter not only reflects the accumulated culture of a people but also the quality of their life. The way in which people organize and use dwelling space can create a better understanding of the form determinants of dwellings. This is because dwellings commonly contribute much to the distinctive character of land-scapes and also stand as the concrete expressions of a complex interaction among cultural skills and norms, climatic conditions and the potentialities of natural materials. The principal types

of explanations regarding house form include physical ones,
involving climate and the need for shelter, materials and technology,
and site; and social ones, relating to economics, defense,
and religion. Social norms and practices, and environmental
factors such as physiography and climate are therefore important
shelter form determinants.

Amos Rapoport[7] one of the advocates of post-modernism
in architecture proposes a conceptual framework for looking
at the great variety of house types and forms and the forces
that affect them. He considers how the houses of the world's
people thus reflect the physical conditions of their environment,
as well as cultural preferences and capabilities, in a wide
variety of solutions to basic problems of house design.

The people who accept climate and the need for shelter
as form determinant argue that man was faced with problem
of designing for climate as soon as he left those areas where
no shelter from climate was needed, and left the shelter of
the cave in less hospitable areas. The house is a container
whose main purpose is to shelter and protect its occupants
and contents from animals and human enemies and those natural
forces known as the weather. Climate, as it affects human
comfort, is the result of air temperature, humidity, radiation
including light, air movement, and precipitation. To achieve
comfort, the climatic variables such as temperature, humidity,
wind, rain, radiation and light need to be handled in such a way
as to establish some form of balance between the evironmental
stimuli so that the body is neither losing nor gaining too much
heat, nor is subject to excessive stresses from other variables.
In architecture the climatic determinist view, still rather

commonly held, states that "primitive man" is concerned
primarily with shelter, and consequently the imperatives of
climate as form determinant[8]. While it would be impossible
to deny the great importance of shelter as an aspect of the
house and as a human need, the basic necessity for shelter
itself has been questioned. On the other hand, one need not
deny the importance of climate to question its determining role
in the creation of built form. But its absolute role is doubted
when considering as to why so many forms of the house have
been developed within the limited number of climatic zones.
Even the variation among the micro-climatic types is relatively
smaller than the number of house types frequently found in
areas of similar climate. At the same time, elaborate dwellings
are found in areas where, in terms of climate alone, the need
for shelter is minimal. Further more, a number of activities
in which protection from the weather would seem to be particualrly
critical, such as cooking, child-birth, and dying, take place
in some areas in the open. The forms of dwellings of different
peoples may be very different in severe climates, and these
forms cannot be explained in terms of climate alone. It must
therefore be realised that there are cases in which the way
of life may lead to almost anti-climatic solutions, with the dwelling
form related to economic activity rather than climate. Although
traditional buildings typically respond to climate very well,
the existence of fairly frequent anti-climatic solutions leads
one to question the more extreme climatic determinist views
and suggests   that other forces must be at work.

There are schools of thought who view materials, construction, and technology as determining house form. In this view, they argue that house forms develop as man learns to master more complex building techniques, and all forms are part of a progressive development in a series of almost inevitable steps. For example, the cave - with no buildings - gives way to the windbreak, the circular hut, and finally the rectangular hut in its various forms, which are, in turn, derived from the various materials and techniques available. There are situations where social values take precedence over technological advances. This is an interesting point, since people tend to equate technological advances with progress without thinking of the social consequences of adopting such advances. In some areas, after thatch has been replaced by more modern materials such as galvanized corrugated iron sheets, it becomes fashionable as an antique with status value and a symbol of success. The vernacular building provides examples in which knowledge of technology does not mean that it will be used[9]. Material, construction, and technology are best treated as modifying factors, rather than form determinants, because they decide neither what is to be built or its form. They only make possible the enclosure of a space organization decided upon for other reasons, and possibly modify that organization. Materials in themselves do not seem to determine form and change of materials does not necessarily change the form of the house.

Closely related to materials, construction and technology is the choice of building site as form determinant. However, the determining influence of the site on house form is still questionable as there is no consistent theory of site as a form determinant. Building site influences both the city and the house but has got nothing to do with the form. The effect of site is cultural rather than physical, since the ideal site depends on the goals, ideals, and values of a people.

Defence and religion has been cited as factors also playing a role in deciding house form. When social explanations of house form are proposed, defence and economics are most commonly used. Defence, however, never fully accounts for form and may even be symbolic. Even where defence is obviously of great importance, as among the Masai, the specific form of the dwelling is related to their attitude to cattle, which is a very different matter. The Masai warrior's kraal, which is also defensive, has a form very different from the 'normal' kraal and no fence[10]. Even in other areas of rural Kenya, defence explanation cannot be accepted because form is not an inevitable result of the need for defence. It can be seen that marriage customs and other factors affect the form of different dwellings. Therefore accepting defence as only determinant of form means neglecting many factors. There is an anti-physical determinism, which neglects a whole set of important material factors and attributes form of houses to religion. This view has been expressed best by Deffontaines and Raglan[11]. Raglan[12] takes the more extreme position which he sums up as "the sacredness of the house" and succeeds in demonstrating

that the house is much more than shelter.   Deffontaines' view
is that while both man and animals seek shelter, a place to
store things, and a micro-climate, only man has a spiritual aspect
which is uniquely human and which distinguishes his constructions
from nests and beehives.   There are examples pointing out
the sacred function of the house.   In Africa, the house is
primarily spiritual, a link among man, his ancestors, and the
earth, and the principal inhabitants of many houses are the
invisible, extranatural and supernatural beings.   It is agreeable
that religion affects the form, plan, spatial arrangements, and
orientation of the house, and may be the influence which leads
to the existence of round and rectangular houses.   The reason
for a culture never having had round houses may well be due
to the needs of cosmic orientation.   In Africa the distribution
of round and rectangular houses is related to the distribution
of religion.   The religious view is over simple in trying to
attribute everything to a single cause.   It is wrong to say
that all these aspects of dwellings have been determined by
this single variable.   This oversimple, almost determinist,
approach is the greatest weakness of a view which provides
insights which seem more significant than those of physical
determinism.   Since there is a choice of symbols, religion as
an explanation of house form is more possibilist, and less
determinist, than the physical explanations of the form.   The
great variety of forms strongly suggests that it is not climate,
site, or materials, construction and technology that determine
either the way of life or the habitat.

Building a house is a cultural phenomenon and therefore its form and organization are greatly influenced by the cultural milieu to which it belongs. Rapoport [13] regards buildings as the result of interaction between man and nature, where man creates a building form that suits his cultural needs except that the form is modified by nature in the form of physical aspects such as climate, landscape or building materials. Man may build to control the environment, but it is as much as the inner, social and religious environment as the physical one that he is controlling, i.e. the ideal environment in cultural terms. If the provision of shelter is the passive function of a house, then its positive purpose is the creation of an environment best suited to the way of life of a people, in otherwords, a social unit of space. It is pointed out that the socio-cultural factors influence house form. The specific characteristics of a culture - the accepted way of doing things, the socially unacceptable ways and the implicit ideals, affect housing and the settlement form. The physical setting provides the possibilities among which choices are made through the taboos, customs, and traditional ways of the culture. Even when the physical possibilities are numerous, the actual choices may be severely limited by the cultural matrix. Man may do what he wants as much as the climate will allow; he uses the tools, technology and materials to come as close as possible to his ideal model. Therefore the relative dominance of modifying factors is as much a function of the people's attitudes to nature as of the forcefulness of the factors; the degree of use of resources and technology is affected as much by goals '

and values as by their availability.   An ideal house is therefore
that which satisfies a family's cultural needs, but the physical
factors and technology control the extent to which the cultural
factors are satisfied.

The socio-cultural factors that often affect the design
of houses in the African context generally have been described
by Denyer[14], Andersen[15] and Fathy[16].   Socio-cultural forces,
therefore, become of prime importance in relating man's way
of life to the environment.   They consider culture to mean
a   total equipment of ideas and institutions and conventionalised
activities of a people.   These factors include religion, family
structure, kinship and other relations; people's basic habits
as to where and how they cook, eat and sleep, the need for
privacy, and position of women in the society.   In satisfying
the social cultural aspects of design, consideration has to be
given to building requirements in terms of climate, materials,
technology and finance.   The modifying factors to a large extent
will determine the durability and the total cost of buildings.
Provided that where the cultural needs of a people are not
satisfied in housing provided to them, there will be increased
undesirability,, neglect and rapid deterioration of such housing.

It is agreed that the decision as to what form the house
shall take is made on socio-cultural grounds.   But once it has
been decided whether the dwelling is to be individual or
communal, permanent or temporary, the whole setting for life
or part of the larger realm of the settlement; once adaptation
to site has been made, and the form has responded to climatic
forces, there still remain universal problems relating to
construction.

In rural Kenya, traditional house form was related to the trend of settlement pattern because water, as a source of food and life, was given the first priority during the settlement. Other people in rural areas associate traditional house form with security. In Siaya District, the traditional round form of houses was not debatable as it was influenced by the socio-cultural forces which were respected by the elders. The only debatable factors were size of the house, position in a homestead and the direction of door opening. Climate, site, materials and technology only modified the form already decided. The functional aspect of traditional house form was for the improvement of physical closeness between activities.

It has been suggested that climatic determinism fails to account for the range and diversity of house forms found through-out the world, and that where climatic influences occur, it is only under conditions of weak technology and limited environmental control systems where man cannot dominate nature but must adapt to it[17]. The impact of the climatic factor will depend on its severity and forcefulness, hence the degree of freedom it allows. It is thus argued that it is possible to control climate artificially using modern technological methods such as air-conditioning. However, there is still a lot of merit in how the indigenous people of any given climatic region adapt housing design under technologically weak state of development. Appropriate choice of building site, proper orientation, correct choice of materials, and logical building form can create a suitable climate. in and around the house. Climatic variables that

directly affect house design are temperature, radiation, precipitation and wind as described by Rapoport[18].

The form of houses at the Coastal region of Kenya is primarily determined by the need for cross-ventilation of all habitable rooms as well as the kitchen. Under the circumstances, a long and narrow, one room wide house would allow for maximum cross ventilation, provided openings or windows are properly positioned on opposite walls.

Building materials and construction methods do not by themselves determine house form, they are only modifying factors that make possible forms which have been selected on socio-cultural background as well as climatic conditioning. Available materials and the methods of assembly may make certain building forms impossible, and others possible when space has to be closed. Rapoport[19] and Denyer[20] have discussed the use of traditional building materials, and have suggested several factors as being determinants for the use of various materials. The factors include availability, tradition, fashion, structural ability, religious proscription, prestige, portability and resistance to weathering.

In conclusion, it should be noted that house form is not simply the result of physical forces or any single causal factor, but is the consequence of a whole range of socio-cultural factors seen in their broadest terms. Given a certain climate, the availability of certain materials, and the constraints and the capabilities of a given level of technology, what finally decides the form of a dwelling, and moulds the spaces and their relationships, is the vision that people have of the ideal ,

life. The environment sought reflects many socio-cultural forces, including religious beliefs, family and clan structure, social organisation, way of gaining a livelihood and social relations between individuals. This applies to rural housing construction in Kenya.

African Traditional Architecture

The mud-brick walls and thatched-roof houses of Africa are typical of the variety of housing styles that enrich the human heritage. However, behind this diversity, housing reflects similarities based on the need for it to serve common purposes of working, eating, sleeping, childrearing, and leisure. Every people that has produced architecture has evolved its own favourite forms as peculiar to that people as its language. It is significant to note that a man's house is the visible evidence of his life style, his family relationships, his income level, his aspirations, and his feelings about his fellow man.

Traditional architecture has contributed much to the bulk of the built environment yet people had tended to neglect it. This makes traditional architecture to seem unimportant. It is the direct and unself-conscious translation into physical form of a culture, its needs and values, as well as the desires, dreams and passions of a people. It is much more closely related to the culture of the majority and life as it is really lived than is the grand design tradition which represents the culture of the elite.

Many tribes in Africa have more than one type of house style. Style is defined here as not only the form of individual buildings but also the way they are arranged in the homestead. Houses with thatched roofs above walls had great variations in shape, materials used and construction techniques. Some roofs rested on pillars and were independent of the walls below them, while others were supported entirely by the walls. Almost all conical or pyramidal thatched roofs were thatched with grasses, reeds, stalks or a mixture of these. In Kenya, among the Luo, Nandi, Kipsigis and Kikuyu, the house form was of round plan, free standing; diameter equal to or greater than height; walls of mud and/or wattle, bamboo or palm fronds; thatched conical roof, convex or concave profile; often with verandah full or part way round; arranged in clusters of buildings within surrounding fence, hedge or wall[21].

Andersen [22] has identified three different house types in rural Kenya constructed since 1950's and observes that the influence of other cultures in the building of African indigenous houses has certainly not always been for the good. The three house types presumably depict the ethnic differences as well as climatic variations, and therefore where change has been introduced so rapidly, essential qualities in traditional architecture have been lost in the technical execution of houses. In the typology adopted by Andersen, he observed that houses in the Lake Victoria area and the highlands of Kenya as well as some of the traditional houses at the Coast would form one category of house types, composed

of rigid frames. Houses along the Tana River, Rift Valley
and in some parts of the Coast would form the second category
of housing with flexible elements planted in the ground at one
end, while the third type of housing would be found in the
semi-desert areas, these being houses whose flexible elements
are planted into the ground at both ends. So even if cultural
needs were taken into account one would end up with not
more than three house types. It would appear therefore
that Andersen's classification is based on structural mode of
construction rather than basic need requirements that determine
dwelling size, density, residential layout, etc. However, there
is not very much difference among the various African groups
in Kenya as to how they use residential space. The space for
various uses may be physically demarcated or left open but
known within the given community. In all cases there will
be at least more than one house in a homestead, depending
on the number of wives, ages and sexes of the children. It
is therefore the allocation of space between various activities,
and not so much whether the houses are round or rectangular,
mud-plastered or grass-thatched, that makes them African.
Among the Mijikenda, however, food preparation is done in
the house, so that one area is used for cooking and social
activities, while the other part of the house is used for sleeping
and other private activities[23]. In Kenyan context, the Kikuyu
homestead, for instance, is made up of several houses, one for
the husband and one for each of the wives[24].

In traditional architecture, everyone in the society knows the building types and even how to build them, the expertise of the tradesman being a matter of degree. The owner of the house is still very much a participant in the design process and not merely a consumer. The design process is one of the models and adjustments or variations, and there is more individual variability and differentiation. Both the builder and owner know the type of house in question, the form or model, and even the materials. What remains to be determined are the individual specifics such as family requirements, size of the house, and relation to the site and micro-climate. This is true among the Luo, Kikuyu, Luhya etc. One starts with the simplest outline, the main features, and adds and elaborates the details and makes adjustments as one proceeds. The execution of work involves the use of principles applicable to every building. A characteristic of traditional building is its additive quality, its unspecialized and open-ended nature that is so different from the closed final form typical of most high-style designs.

In all but a very few cases the architecture considered was created without the aid of architects or even specialized builders. In the 18th Century, Equino wrote that:

> Everyman is a sufficient architect for
> the purpose. The whole neighbourhood
> afford their unanimous assistance in
> building ..... and in return receive
> and expect no other recompense than
> as feast[25].

This was about the Ibo homeland but it could equally well have been written about hundreds of other societies in tropical Africa then and now. Even in Siaya District, the traditional architecture was a personal adaptation of a group solution. The model itself was the result of the collaboration

of many people over many generations as well as the collaboration
between makers and users of buildings. The buildings are
regarded as the result of the interaction of man; his nature,
aspirations, social organization, world view, way of life,
social and psychological needs, individual and group needs,
economic resources, personality, fashions, physical needs and
techniques available; and nature, climate, site and materials.

The study of African traditional architecture demand
an interdisciplinary approach because it is inevitable that
things will be said which specialists in individual disciplines
will take issue. And it would be quite wrong to see the
temporary nature of many of the buildings as epitomizing an
unstable society. Houses were built using local materials and
according to Denyer[26], permanent houses would have been
an embarrassment for many people, for instance the hunters
and gatherers such as pygmies and bushmen, the migrant
pastoralists such as the Fulani and the Maasai. For instance,
among the Hausa divorce was frequent and the adoption of
children common, and so families changed often in size
and composition and therefore the houses changed to suit the
new needs. For example, when one Tiv Chief died and another
appointed, houses were gradually re-orientated as they were
rebuilt to face the house of the new chief. Houses were built
to reflect the social arrangement[27].

One of the most frequent sources of error on questions
of African traditional architecture, even amongst some quite
serious writers, is the tendency to generalize from a very narrow
base of experience. Africa has also suffered from interpretations,

often apparently founded more in ideology or emotion than in careful study, put forward by generations of outsiders. An example of such a theory is that the continent was originally covered with round houses but that under the influence of foreign contacts these are gradually giving way to rectangular ones. This is far from the truth because rectangular houses used to be constructed in some parts of the continent, e.g. among the Hehe of Tanzania, Ibo of Nigeria, Asante of Ghana, Coastal regions of Kenya, etc.[28]. An eminent scholar in another field has said,

> as a rule traditional African houses are round
> in shape, built around the village compound
> so that if there are several houses in one
> compound, they also form a circle or semi-
> circle. The houses generally face the centre
> of the compound .... it is difficult
> to say dogmatically what this round shape
> of houses and villages. may indicate ......
> one can only speculate the symbolic meaning
> of African villages which so remarkably
> resemble one another all over tropical and
> Southern Africa[29].

African villages usually expressed physically the social structure of the group of people living in them. The actual relationships varied from year to year as people were born married, divorced or died. Traditional construction in the rural areas of tropical Africa was almost always a highly cooperative venture.. Building would be a major social occasion in which both the men and women of a village cooperated. With very little division of labour, with the need to use essentially voluntary manpower, and with every house conforming to type and custom, one would think that construction techniques would have to be extremely simple. The method of building construction explains how African traditional architecture worked. In the Coastal region of Kenya, for example, there are two types of so called

traditional house, the Mijikenda house, and the Swahili house.

The construction of the traditional Mijikenda house has been

described by Andersen as follows:-

> The old traditional house .... in this area is
> rectangular in shape but rounded off at the corners.
> The main posts are tied to the beams to form a low
> ridge.   Until the structure is dry it is supported
> by a simple scaffold.   Stronger poles are used at
> the entrance to push the structure upwards and
> outwards, to make more room for the doorway.
> A series of supports is built on each side of the
> entrance to keep the resulting hump above the
> doorway in place.   Then the whole structure is
> thatched with grass.   This finish gives the house
> the appearance of a horse mane[30].

In addition, the rounded corners of the house have

been straightened, , giving a rectangular or square shape to

the house[31].   African traditional architecture is quite

important in the understanding of this study because people

in Kenya's rural areas still depend on the traditional methods

of construction and use of locally available building materials

in their struggle to provide themselves with adequate housing.

Housing Conditions in Rural Kenya

It is generally accepted that housing is one among

several means for fulfilling individual, family group

and societal needs.   However, owing to the diversity of national

circumstances, social needs will differ, even though there

is a certain unity in humanity.   The conditions for housing

depend on external circumstances (climate, ground characteristics and

building materials), and technical and economic possibilities. These variations must

be recognised and taken into consideration at every stage of a

particular society's economic development.   Given the possible

diversity of cultural values, as well as stages in economic

development between different countries, and between different regions

within a given country, there would be no single type of housing
which can fulfil all social needs and be regarded as universal.

Housing conditions in third world countries are usually
investigated in the urban environment and therefore housing
in rural areas receive very little attention. As a result very
few studies focus on the housing situation in the rural areas.
Housing conditions are generally considered in terms of form
of construction and the availability of amenities such as water
and latrines. In the sparsely-populated and poorly-developed
regions of the rural sector of Latin America, most dwellings
take the form of huts. These are usually constructed with
local materials and have no connection to piped water services
and the only sanitary facility is a latrine[32]. In Asia, rural
areas have the most serious problems in regard to both
quality and quantity of dwellings. In Indonesia only 0.61%
of the rural dwellings were permanent constructions with the
rest being either semi-permanent or temporary dwellings[33].
In the rural areas of India, 34% of the families lived in a single
room or shared it with another family in 1960's[34]. In Africa,
a large part of the existing dwelling stock is self-constructed
by the low-income groups using perishable and low-quality
materials. In the rural areas, for the few countries for which
there is information, the proportion of dwellings with piped
water and sanitation is relatively low. The World Housing
Survey (1974) by United Nations indicated that there was
less information on the housing conditions of rural population
currently available.

House building in rural areas is still dominated by traditional materials and construction methods, but other materials or products and different applications of traditional ones are being introduced, for example, use of corrugated iron sheets. The combination of wood and mud is the most common building material in Kenya. It is used in all districts except for the nomadic pastoral areas in the north and east and Masailand. Bricks are mainly used for dwelling houses in areas where there is suitable clay for making them as in eastern and parts of central province. The main roof covering materials are grass and palm leaves[35]. In some areas, the standard of housing is very poor. Housing conditions in some areas of Kakamega District are appalling such that small houses originally made of mud and wattle with thatched roofs are hardly worth calling houses. There can be seen big holes or cracks in the walls so that wind and rains have free play, and the roofs are completely dilapidated[36]. Most of the houses in the rural areas of Kenya, Siaya District included, are of poor quality because they require repeated repairs and frequent maintenance, and eventually become dangerous to inhabit because of increasing structural deterioration, vulnerability to high winds and heavy rains, infestation by vermin and high flammability.

In a survey carried out in the rural areas of Kenya, it is revealed that the most common types of materials used in the construction of main dwelling units are thatched roofs 68.8%, mud walls 81.3% and earth floors 90.5%[37]. Water was found to be available with varying distances, however, about

88.7% of families had water within a distan:e of 2km from the source[38]. Although some information becomes available through surveys done by the Housing Research and Development Unit (HRDU) at the University of Nairobi in collaboration with the Department of Geography of Developing Countries, University of Utrecht, Netherlands, knowledge about the variety of factors influencing rural housing conditions in Kenya is still inadequate. So far they have compiled reports on Kiambu (1978), Kisii (1981), Kisumu (1982), Kakamega (1983), Nakuru (1984), and Kwale (1985) Districts.

In Kwale District, for example, the traditional Mijikenda houses with grass walls comprise 5.8% of the housing stock included in the survey. Houses show relatively little variation in terms of building materials and building style. Almost all houses 85.8% have mud and wattle walls, 84.2% without plaster, thatched roof either made of grass 29.4% or Makuti 55.5%, floor of earth 91.7% and foundation of poles in earth 95.5%[39]. In Kakamega District, houses also show little variation in building materials. Almost all houses have mud and wattle outer walls (95.7%), with a clay dung (36%), or a pure clay plaster (32%); a foundation of poles in earth (96%); a floor of earth and clay mixed with cow dung (76.5%); and either mud and wattle partition walls (65%) or no partition walls at all (23%). The main differences between houses are found in the type of roofing materials and the availability of doors and windows[40]. Apart from the type of building materials, the present housing stock also differs in size. In general, households in rural areas adopt to increasing household size by building additional dwelling units.

The reports on rural housing conditions in the various districts reveal that housing conditions are influenced by such factors as variation in the natural environment; the cultural setting comprising the attitude towards housing and the available craftmanship; high population densities; the organization of agricultural production and related degree of commercialization; the economic situation, the income conditions of the population in particular; farm size; types of soil and other available building materials; and the ecological conditions. In addition, government policy, especially with respect to amenities and services forms a major determinant of the quality of housing in rural areas.

The poor quality housing in Kenya's rural areas is a problem that requires solutions. The possible reasons for the poor quality may include the process of construction, building materials available and level of technology, socio-cultural forces, housing perception, low average incomes per person and its distribution. According to Mabogunje[41], there are three main factors characteristic of Africa that play an important role in the determination of the dwelling situation namely, the very low average income per person and the marked differences in income distribution, the multiplicity of cultural groups, and the superimposition of cultural models resulting from foreign colonization and the dominantly rural character of the population. It is generally expected that housing conditions reflect the income position of households.

There are problems involved in attempting to measure, as objectively as possible, the physical quality of housing and its environment. By comparison with charactericstics, housing assessment is complicated by social, economic and political overtones. The desirable characteristics of a house are many different things to many people. Duncan[42] discusses possible techniques in measuring housing quality e.g. the housing defects index, the index of decay, the house condition index, the survey of housing and environmental deficiency etc. The Housing and Environment Defects Index (HEDI) is capable of identifying the number of dwellings in an area which fall below a given standard. It include some assessment of the surrounding of the dwelling[43]. It cannot however be applied in the rural areas, otherwise, the whole housing stock would end up being poor.

Housing conditions can be used to determine housing quality and can be more favourable if measured solely in terms of construction materials. However, housing conditions as they affect household have to be gauged in a broader sense whereby account is taken also of living space and available amenities. For the purposes of this study, housing quality generally is based on subjective quality judgements of the observed floor, wall and roof conditions. In order to allow for a subjective comparison of general housing conditions for individual households and for the sub-areas of the district, and to trace factors related to differences in housing conditions, a score system is designed and different values attached to selected aspects of housing and the amenities and services. Both

selection of these aspects and scores attached are highly
arbitrary. Nevertheless, they are based on observed and
recorded values attached to various aspects of housing,
e.g. floor, wall and roof. If housing conditions would only be
labelled "satisfactory" in case of cement walls, a good quality
corrugated iron or tiled roof, a separate kitchen and bathroom,
and piped water supply to individual homesteads, then all
households would qualify as having sub-standard housing conditions.
Using a score system (see appendix3) designed, various
aspects of housing conditions are weighted. The relative
weight of each aspect is determined by the importance attached
to the aspect on the part of the population as realised during
the research disucssions.

Determinants of Housing Need

Housing needs are defined as the number of conventional
dwellings or other suitable living quarters that need to be constructed
or repaired in order to bring housing conditions, as of a particular point
in time up to nationally adopted standards, plus the number that
need to be constructed, repaired and/or maintained and/or
improved to ensure that housing conditions remain at the standard
level over a stated period of time [44].

There are three main aspects of housing need namely;
the need resulting from net additions to population, whether through
natural increase or migration in the case of urban areas, the
need arising from loss of dwellings to the housing stock
through obsolescence or demolition; and lastly the backlog of
housing need consisting of people inadequately housed or without

housing of any kind at the present time. Any housing needs assessment must begin with the analysis of current housing needs and then project future housing needs taking into account demographic, social and economic changes likely to occur over the course of the planning period.

. Comprehensive information on the quantity and quality of housing in the rural areas of Africa is lacking though it is clear that overcrowding is widespread and that much of the housing stock is dilapidated and need replacement or improvement. Estimates of housing need are considered in terms of broad areas, which are common, in varying degrees, to all housing situations viz; the need to provide shelter for the homeless; the need to provide adequate housing for the occupants of shacks or other makeshift housing; the need, recognized in most countries, to provide separate accommodation for each private household; the need to keep levels of density from rising beyond certain limits; and for the future, the need to make provision for the anticipated increase in the number of households; and the need to replace housing as it reaches the end of its useful life[45].

Estimates of rural housing needs in Africa are subject to even greater uncertainty largely because of the widespread practice of polygamy and the consequent difficulty of distinguishing the appropriate family or household unit for housing purposes. One of the most critical variables affecting estimates of housing need resulting from population increase relates to the number and size of household. The magnitude of housing needs in developing countries as recognized by the United Nations

is reflected in its estimates of an annual rate of housing
provision of from 8 to 10 housing units per 1,000 persons needed
to overcome existing deficiencies and meet future needs[46]. It
should be stressed that an evaluation of housing needs does
not necessarily imply an increase in house building activity.
Such an increase may not be justified in the cirucmstances
of a particular country.

Estimates of current and future housing needs are clearly
a prerequisite for the formulation of an effective national
housing policy. The housing needs assessment methodology
highlights two central aspects of need: the projected need
for housing i.e., physical housing needs in terms of numbers
of dwelling units required over the planning period to
adequately house the population; and the level of investment
required to bring the entire housing stock to a minimum level
of quality commensurate with projected requirements. The
key factors affecting housing needs and investment requirements
include variables affecting both the demand for and supply
of housing. Demand factors include population growth, household
formation, household income and distribution, and alternative
mortgage lending terms. Supply factors include the cost of
alternative housing solutions, the conditions of the existing
stock of housing, and the potential impact of increased demand
on those costs.

In planning for rural housing need, the elements to
be considered include replacement of the existing structures,
improvements and putting up new buildings. All housing needs
are to achieve four objectives in order to be successful

namely; needs to be socially and culturally valid; should
be sufficiently economical to ensure that the greatest number
of people can afford it; should ensure the maintenance of the
health of the occupants; and should be a minimum of maintenance
over the life of the building.   No attempt has been made to
deal with estimates for selected areas or population groups
apart from the major urban areas, or to analyse the
interrelationships of household characteristics and housing
conditions.   Neither has any attempt been made to discuss
housing needs in terms of the type of housing units required
or the area, number of rooms needed for a particular household,
cost etc.

There are two methods that have been proposed for
arriving at over-all estimates of housing needs, namely; a general
method and a crude method.   The general method assumes that
basic statistical data on which to base the estimates are available.
Using the general method, the total need for new dwellings
or other acceptable living quarters over a stated period of
time may be expressed as

$$E(t) = K[E_1 + E_2 + E_3 + E_4 + E_7(t)] + E_5 + E_8(t)^{47}.$$

where   K = Coefficient to allow for vacant dwelling.
K is not applicable to the number of new
living quarters required to replace substandard
units (E_5) or to replace living quarters that will
be lost from the inventory $E_8(t)$.

E_1 = The number of living quarters required for
households without shelter.

E_2 = The number of an unacceptable living quarters required for
households occupying living quarters of an acceptable
type.

E_3 = The number of living quarters required to provide separate accommodation for households involuntarily doubled - up with other households in living quarters of an acceptable type.

E_4 = The number of living quarters required to reduce levels of density (persons per room) in acceptable living quarters to a desirable level.

E_5 = The number of living quarters required to replace living quarters which are of an acceptable type but substandard, or dilapidated and beyond repair at the beginning of the period covered by the estimate.

$E_7(t)$ = The number of living quarters that will be required to house the projected increase in the number of households during the period (t) covered by the estimates.

$E_8(t)$ = The number of living quarters that will be required to replace living quarters of an acceptable type which will be lost from the inventory during the period (t) covered by the estimates.

The housing needs expressed by E_4 may be met by increasing the size of the living quarters that will be constructed to meet the needs reflected by E_1, E_2, E_3, E_7 and E_8. It can therefore be omitted from the above equation.

In situations where the statistical data available are insufficient to prepare an aggregate based on separate estimates for each of the components listed above, a very rough estimate of housing needs can be arrived at using a crude method. In most countries the total population and rate of population increase are known and there is a rough idea of the size of households. If, in addition, data can be obtained on the total

number of acceptable units in the housing inventory and their
average useful life, this information can be used to provide
a reasonably good indication of the magnitude of the housing
problem. In the rural areas there are no people who can
be said to be homeless; and the problem of high density is
solved by constructing additional dwelling units whenever
need arises. The over-all housing needs (E_t) may therefore
be expressed as:

$$E_t = H - U + H_t + rU_t^{48}.$$

Where   H = The number of households as of
the beginning of the period
covered by the estimate.

U =   The number of acceptable living quarters
in the inventory as of the beginning of
the period covered by the estimate.

H_t =   The projected increase in the number of
households during the period covered
by the estimate.

r =   Percentage rate at which acceptable
living quarters will need to be replaced
during the period covered by the estimates.

The crude estimates used in the study would reflect the total
number of dwellings required to eliminate the existing housing
shortage, plus the number required to house the increase in the
number of households and to replace units lost due to
obsolescence in Siaya District. Houses meeting minimum
shelter standards as pointed out in Chapter 1 are considered
as acceptable living quarters, being adequate housing for the
purposes of this study.   There are many intriques involved
in measuring housing needs for a rural area like Siaya District

because of lack of sufficient information regarding the actual housing situation, the need is also measured in terms of number of rooms and form of construction considered satisfactory and adequate by the households themselves.

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CHAPTER 3

HOUSING IN NATIONAL DEVELOPMENT AND
ROLE OF GOVERNMENT AGENCIES

Introduction

Housing may be used to mean both the stock of dwelling units, and the process and product of shelter creation for human beings. According to the World Health Organization (WHO) report of 1961, housing is defined as a "residential environment, neighbourhood, a micro-district or the physical structure that mankind uses for shelter and the environs of that structure including all the necessary services, facilities, equipment and devices needed for the physical health and social well being of the family and the individual".

Housing is a very complex product being both an economic and a social process. It represents the bulk of the nation's wealth in form of cities and villages, and therefore play a tremendous role in a country's development. As a social process housing is visualized in terms of comfort, contentment, health and aesthetic satisfaction. Housing as a product is bulky, durable and often permanent. Compared to other human needs, housing can be postponed and has got several social needs as it provides the basic shelter for the family. As an economic good, housing is unique in several ways, for example, has a long life and high cost involved in its production process. However, it affects everyone in the daily basis of life, whether as tenant, landlord, mortgagee, owner-occupier, urban dweller or a person living in the rural areas. Therefore housing

cannot be considered in isolation but as an integral part of the social scene, and the urgent need for society to create and control its environment is gradually being recognized. It is such a complete subject regulated by an involved system of controls built up in successive attempts to deal with the symptoms of housing deficiency, governed by sometimes illogical and often inequitable financial arrangements and frequently influenced by conflicting political and selfish interests.

There appears to be no general consensus of the meaning of the word "housing". It may be used both as a concept meaning a family home or a whole developed estate. However, the meaning attached to it is not sifnificant. Turner[1] says that the important thing about housing is not what it is, but what it does in people's lives, in otherwords that dweller satisfaction is not necessarily related to the imposition of standards. The first significance of housing is related to the need for sanitary shelter. The need for shelter, like that for food, is universal and basic. It should be noted that the moment that housing, a universal human activity, becomes defined as a problem, a housing problems industry is born, with an army of experts, bureaucrats and researchers whose existence is a guarantee that the problem won't go away.

This Chapter is organized into four broad areas namely; role of Housing in National Development; National Housing Policy and Policy Formulation; role of the National Housing Corporation (NHC) in rural housing development; and the role of the Housing Finance Company of Kenya Limited (HFCK) in housing development.

Role of Housing in National Development

Though the countries of the world differ greatly in their levels of industrial and social development and the nature of their economic and political systems, the importance of housing and its related facilities as vital elements in determining the standard of living and as integral parts of the development process and the need for government to take a major share of responsibility for improving the level at which they are provided, are generally recognized. The role of government may vary from the planning and control of all aspects of housing production - land, investment, construction and occupancy - to intervention only at certain levels.

Perceptions of the role of housing have been broadening. In the past, when housing was looked upon primarily as a physical phenomenon, policies for the provision of housing centred on construction costs, combinations of alternative material inputs and the level of standards and finish. In recent years, however, the economic and social costs and benefits of housing have began to receive more emphasis. The social benefits that can be derived from improved housing are increased social stability, improved environmental conditions, and incentive for community participation. Therefore housing not only provides shelter for a family but also serves as a centre of its total environment. As a focus of economic activity, as a symbol of achievement and social acceptance, and as an element of urban growth and income distribution, housing fulfills a social need and satisfies criteria for remunerative urban investment.

For countries in early stages of development, the high rate of population growth and rapid urbanization have created housing needs which are extremely difficult to cope with in the face of low levels of output and income, under-utilized natural and human resources and often ineffective administrative and government structures. The considerable importance of housing to the urban and national economy as a significant measure of economic and social progress, contrasts sharply with housing conditions and official policies that exist in many developing countries. For all but the middle and upper - income groups, housing is usually costly in relation to income and the quality of dwelling available.

As an investment good, the social needs of housing may justify the allocation of resources for its provision. Housing can therefore be compared to agriculture and manufacturing industries in terms of investment outlet. But in comparison to industry and agriculture it has been contended that as an economic activity, housing has a lower rate of return on capital invested. For instance, it is often asserted that housing expenditure requires too many inputs such as land, building materials, labour, finance and entrepreneurship to produce few outputs. This has led to housing being subordinated in the priority of expenditure in most countries with the result that only few units end up being produced.

However, the economic benefits that can be gained from achieving the objectives of housing policy are substantial namely; increased capital formation and an increased demand for local building products; increased productivity of labour; increased

employment in building and related activit.es; and increased
incentive for local savings.

Housing and increased capital formation

One indicator of how much the country can afford to
spend on housing is given by the proportion of Gross Domestic
Product (GDP) invested in the construction of new dwellings.
Because traditionally housing has been regarded more as a
consumption good rather than an investment good, many economic
planners of most countries without considering local circumstances
have decided that only l5 - 20% of the gross fixed capital
formation, or that only as low as 5% of the gross domestic product
of a nation should be attributed to housing investment[2].
Residential construction makes up as much as 20-30% of gross
fixed domestic capital formation in countries in which emphasis
is given to housing and about 2-5% of gross domestic product
in most developing countries[3]. The true importance of housing
is greater than the figures suggest,   especially in developing
countries, since self-help construction and commercial activity
by independent contractors is not reported at all or is greatly
undervalued.

In Kenya, the building industry contributes
significantly to the country's gross capital formation. In l983 ,
the industry contributed 28% of the country's gross capital
formation, of which 54% was due to residential development,
and in terms of gross domestic product, its share was 5.5%
per annum[4]. The precise impact within the non-monetary
sector of the residential construction, output of which is
estimated to be approximately 50,000 traditional homes per annum,

mainly in rural areas, is not known. Housing therefore
accounts for a significant share of capital formation and thus
contributes importantly to national output and employment.
Housing construction in the monetary sector rose from K£70.36
to K£115.34 million a year during 1978-1983 period. The trend
of investment in housing has continued so that in 1983, for
instance, out of a total fixed capital formation of K£749.35 million
in Kenya, the whole building and construction industry contributed
49.4%[5]. Its share of the total gross domestic product was 9.7%[6].
Furthermore, the total gross fixed capital formation in dwellings
as a percentage of gross domestic product (GDP) has been
4.7%, 4.7%, 4.6%, 4.3%, 3.4% and 3.4% in 1979, 1980, 1981, 1982,
1983 and 1984 respectively, of which modern dwellings contributed
2.7%, 2.8%, 2.7%, 2.4%, 1.4% and 1.3% of the gross domestic
product during the years[7].

   The result of low priority in housing investment is reflected
in the acute housing shortage in major urban areas in Kenya and the poor
housing conditions in Kenya's rural areas. For instance, in terms of development expen-
diture the Ministry of Works,Housing and Physical Planning which
undertakes housing development was estimated to spend only
3.9% as opposed to 12.4% for Ministry of Agriculture and Livestock
Development, 10.1% for Ministry of Water Development and 24.9%
for Ministry of Transport and Communications of the
government's total gross development expenditure for the
1984-85 financial year[8]. The trend of investment in housing
has not changed, thus making it virtually impossible to meet
the requirements of constructing 10 houses per 1000 inhabitants
per year as recommended by the United Nations for developing

countries.

However, it is being recognized that investment in housing may under certain circumstances be as productive as alternative forms of investment. Arrangements that encourage home ownership, for example, savings and loan institutions, self-help programmes, co-operatives and such similar institutions may stimulate investment that would not otherwise take place. Increased housing activity creates employment in building materials industries and the construction sector apart from creating demand for locally available building materials and other related building products. Housing also has economic significance as an investment because without the incentive of housing programmes, the building industry may not develop, forcing countries to be dependent upon imports of both materials and technical skills, and impeding progress on other types of investment programmes necessary to economic growth.

Housing and increased productivity of labour

There is need to increase expenditure on housing development because of the role of housing in the development process, for example, in industrial production. Housing has direct and indirect effects on worker productivity and health and is a necessary adjunct of new industrialization schemes. Good housing is a necessary pre-requisite for industrial production. It has been asserted that well housed workers have greater production than poorly housed workers because good housing reduces cost of public health, with consequent important gains for the nation's economic performance. The

Kenya Breweries Limited, for instance had recognized the

fact.   The then Managing Director once   noted in a

statement that:

> Housing administration has been our area
> of concern for half a century. We have
> housed our employees not out of necessity
> but because it makes sound business sense
> in that it assists production when an
> employee is not worried over the welfare of
> his family[9].

It is however doubted whether any industry in Kenya

has   ascertained by how much good housing improves production.

Studies carried elsewhere have shown quantitative results that

improved health is another important benefit not captured

directly in housing transactions but represents cost savings

both to individuals and to the public.   In a study of relocated

miners in Hambaik Korea, it was found that the health

benefits of improved housing could be measured in terms of

a yearly saving of fifty clinical visits per hundred of the rehoused

population, annual cost savings of $13.94 for each household[10].

The Korean study is one of the few to link improvements in

housing with better health in a cost-benefit framework.   Such

benefits are reflected in higher productivity of better housed

workers.   It found that average weekly output per worker

increased 28%, from US$13.00 before rehousing to US$17.40

after rehousing[11].

The most notable way in which housing investment

contributes to increases in productivity is by drawing on labour

and other factors of production which are currently unemployed

or underemployed and are having a relatively high elasticity

of supply.   Investment in the housing sector should imply a

more efficient use of existing resources and the use resources
that would otherwise remain idle. There is therefore need
to ensure that industrial development is accompanied by
residential housing development to improve the welfare of workers
and also to improve the productive capacity.

Housing and increased employment

Studies have shown that investment in housing has
significant impact on income and employment through multiplier
linkages. First round effects are the direct increments to
income and employment generated by construction activity.
Housing industry is therefore a major generator of employment
opportunities for unskilled and semi-skilled labour. A major
factor closely related to housing and urban development is the
existence in many developing countries of a large pool of
unemployed and underemployed labour, consisting primarily
of unskilled rural migrants.

In Kenya, for instance, in 1974 the housing construction
created large amounts of direct employment of some 12,000 man-years
annually because of its relatively high labour content[12]. On
average, each £1 million spent on modern housing in Kenya
meant one year's full time employment for 2,000 men, of whom
some 500 were skilled and 1,500 unskilled workers. The number
of those employed in the construction industry had steadily
increased. By wage employment by industry, the construction
of buildings as an industry had employed 16,585 people in 1983[13],
1.52% of the total country's employment, excluding those in
the traditional sector of the economy. These figures do not
include the multiplier effect of housing construction on

employment in sub-sectors, such as production of building
materials, furniture making, transport services and infrastructure
construction. Estimates for Columbia (South America) suggest
that the income multiplier for housing construction is about two,
and that about seven additional jobs are created for every
US$10,000 spent on the construction of dwelling units[14]. In
Korea the income multiplier of housing construction is estimated
at two, and about fourteen additional jobs are created for every
US$10,000 invested in construction[15]. The rate of employment
creation in housing construction in Columbia was higher than
that for manufacturing and close to that for the economy
as a whole.

When all effects of housing construction, indirect and
direct, are considered, as studies of single family dwellings
in Columbia, Mexico, and Venezuela suggest, the employment
generating capacity of housing investment by low income households
may in some circumstances be greater than similar spending
by high income households[16].

Investment in housing is particularly well suited to
absorbing labour resources whose alternative marginal product
is low. Newly arrived rural migrants often work for a few
years in construction, which provides a springboard to other
income earning opportunities in the city. However, increase
in employment opportunities would in fact be a major consideration
in a developing country like Kenya where unemployment is
a major problem.

Housing and increased Savings

Housing development also needs to be stepped up so
as to relieve savings and unproductive capital into the economy.
Where houses are provided in the towns particularly for owner-
occupation, there has been evidence of an incentive for
attracting otherwise unavailable savings into intermediary
financial institutions in the form of down payments. The urge
for home ownership has made many people to increase their
savings in anticipation for house purchase. Therefore an increased
expenditure in the development of housing will serve to meet
the pressures of housing need and stimulate the whole economy.

The problem of providing a safe, hygienic and decent
shelter in rural areas, in the context of an extreme shortage
of capital resources as compared to capital needs, can therefore
be met through increased savings for the purpose of house
construction. Once housing development has been accepted
as an integral part of a national programme, it should be
accorded a more substantial position in national development
priorities. A housing plan defining the various roles of the
public and private sectors by stating how many units each
sector would build, or finance should then be drawn in the
context of the overall national housing policy.

National Housing Policy and Policy Formulation

The magnitude of housing problem in development
nations has generated a great deal of interest on the part of
governments for a comprehensive set of housing policy
guidelines. Kenya, like other developing countries, therefore,

decided to have a national housing policy with the hope of
alleviating the housing problem which was increasing as the
rate of urbanization and population growth increased.   A
national housing policy is generally part of the national
development policy on human settlements.

Historical Development

During the early periods of colonial administration, Kenya
had no clear cut housing policy particularly for the African
population.   There was a general belief by the colonists that
an African was not a town dweller and hence no serious need
for housing provision.   If any accommodation was provided,
it was to be on bed-space basis or single rooms in a row of
terraces with communal sanitary facilities.   For example, in
1966 more than 49% of urban African households shared
accommodation at the rate of about three persons per room[17].
In the urban and trading centres, the provision of housing
was the responsibility of the employers, and there was no
consideration that some employers would be unable to provide
housing.   However, the provision of single rooms meant that
the housing units would be seriously overcrowded.

A variation in the housing policy during the colonial
era was introduced by Alderman Ernest Vasey who was appointed
by the Government in 1950, to study the problems of African
housing in townships and trading centres in Kenya.   He
confirmed that most of the accommodation provided was in the
form of dormitories or lodging houses for the poor African
workers.   The building regulations also insisted on standards
which in effect prohibited almost all African workers from

building permanent structures themselves. In his report he considered that subsidising African housing was only necessary in the short run. He recommended that where rental housing was provided economic rent should be charged to meet the combined fixed and recurrent costs. At the same time, the Government should encourage Africans to build their own housing so as to reduce the burden of housing provision by the local authorities. He also recommended that Africans should be granted leases in urban areas to build their own houses, even if it meant lowering standards, and establishment of an institution to undertake research on cheaper methods of construction for housing. Vasey's recommendations were finally accepted by the Government and became the guiding principle of Kenya's official housing policy at the time of independence. During this period, nobody ever thought of the housing conditions in the rural areas. This can be attributed to lack of comprehensive statement on the housing policy.

When Kenya attained independence in 1963, African population came in large numbers to the towns and the housing conditions had not changed to any good because the rate of housing development had been so slow during the colonial period that the housing situation had become serious. Thus with the coming of self-rule, the Government decided to call a United Nations team of experts early 1964 led by Lawrence Bloomberg and Charles Abrams to "conduct a study of short and long-term housing needs and

to make recommendations on housing policies within the
framework of social and economic development planning"[18].
According to the team, first impressions of Kenya's housing
situation revealed both similarities to and differences from
those in other African countries. There was the same
migration to cities from the rural areas, the pressures of
overcrowding and housing shortage; and lack of capital with
which to build houses. The United Nations Mission to Kenya
on Housing published their report in May 1965 and stated that
a minimum estimate of at least 7,600 new housing units were
to be built each year for the period 1962 to 1970 inorder to
alleviate the housing problem in the towns[19]. The most
outstanding recommendation was the establishment of a
National Housing Authority with wider powers and financial
resources to replace the existing Central Housing Board.
The body would act as the Government's chief agency through
which public funds intended for low-cost housing will be channelled
to local authorities and other housing development organisations.
The government gave very careful consideration to the report
and welcomed it as containing a useful approach to the housing
problem facing the country on which a sound programme
for development could be based.

In 1966, the government decided to have a housing
policy to be used and issued for the guidance of all
concerned with housing development. The first housing policy
for Kenya was contained in the Sessional Paper No. 5 of
1966/67 making a number of significant references to the
recommendations of the United Nations Mission to Kenya on

Housing. The Sessional Paper, unlike the United Nations
Mission's report, was an authoritative statement by the government
on the housing problems confronting the country and how the
programme for its solution would be planned and administered .
The government had realized that housing is a vital factor in the
nation's economic and social development and that its effects
have a bearing on the morale and stability of Kenya hence the
need for the provision of adequate housing.

It was therefore the intention of the government to move
away from the policy of bed-space for families, which was
practised during the colonial era, and to provide dwellings
which have all the essential amenities for a decent family life
in the urban areas. As for the rural areas, the government
accepted the United Nations Mission's finding that the demand
for new housing was at least five times as great as that in
the towns. The rural population had little problem of
overcrowding or space restriction, but there was a great
need to improve the standard of rural housing. The
government's rural development housing policy was to use
building demonstration teams in selected centres where rural
people were to be taught how to build good houses through
self-help and the use of local materials. This was part of
development policy aimed at stimulating increased economic
activity, in the country as part of the plan to make rural
life more stable and attractive for the people and to reduce
the drift of population into the main towns.

In full recognition of housing's strategic role in improving living conditions and raising the nation's economic performance, the government declared during the 1970-1974 Development Plan Period the major housing policies. As already pointed out in Chapter 1, the prime objective of government policy in housing is to move towards a situation where every family in Kenya will live in a decent home which provides at least the basic standards of health, privacy and security. The government considers the minimum requirement for a decent home or a complete housing unit to be a two-habitable roomed house, constructed of permanent materials, with a separate kitchen and basic sanitary facilities such as toilet and shower compartment. The occupancy rate for a two-roomed house occupying an area of 38.5 square metres is taken as 5 persons. Whether this goal in housing can be achieved is yet to be seen. The policy aimed at utilizing all the resources that can be made available in a manner to achieve the maximum possible improvement in the quantity of housing by building as rapidly as possible a national stock of housing. Because of the extreme urgency of urban housing needs, most of the government's development programme is directed to help meet them. For instance, out of the projected total investment in housing of over K£53 million during the 1970-1974 Development Plan Period, the government planned that 85% of development expenditures for housing be in urban areas[20]. The trend has continued in favour of urban areas. According to net expenditure for the 1983/84 financial year, loans to rural housing amounted to £500,000 out of the total net expenditure

of £6,350,050, set for housing development[21]. This accounts
for only 7.9% of the total net expenditure.

In Kenya, the government policy on rural housing
remains unclear as there is no nationally acceptable housing
standards as a general requirement. The policy makers
continue talking of decent housing capable of raising the
living standards of people in rural areas without specifying
the requirements. This however can be attributed to the
socio-economic set up of the various rural communities in the
country. Norms and cultural practices of various rural communities
would be a major hinderance in deciding on a uniform housing
standard to be adopted in rural areas.

For example, according to 1970-1974 Development Plan,
the housing demand in rural areas was estimated at upto
50,000 homes annually. Almost all this demand was for traditional-
type shelter by the lower income rural population, and had
to be met in the traditional way by using family labour
and local materials. On rural housing, the Development Plan
stated that "until rural incomes and expectations can be
materially raised, so that rural families will actively demand
housing of higher standards and more modern design, there
is not much scope for housing development on the same
basis as that projected for the urban areas. All but a small
proportion of the rural families meet their shelter needs by
building their own traditional type housing, in a volume
estimated at over 40,000 units per year. No large scale
financing by the government is contemplated for this grade

of shelter, but encouragement and technical assistance as possible will be extended through Provincial Housing Officers ...."[22].

The construction of housing in the rural areas have continued to be the people themselves although the Government considers the improvement of housing in such areas to be of prime importance. Most rural housing is still mainly traditional, having been designed to reflect the cultural heritage and built by the use of traditional techniques and local building materials. During the 1974-1978 Development Plan, the Government accepted to provide funds for research, education and technical advice and assistance besides providing K£1.15 million for the Rural Housing Loan Fund[23].

It was not until the 1979-1983 Development Plan Period when the government gave much more emphasis to the improvement of rural housing conditions. The measures to be adopted were; increasing the share of development funds for rural housing from K£1.15 million allocated during the 1974-1978 plan period to K£6.8 million; continuing giving loans to individuals in the rural areas to assist them in the construction of permanent houses; providing building type plans based on the needs and traditional requirements of rural families; providing technical, administrative and financial assistance to approved rural housing societies; and carrying out research on the use of local building materials and techniques that could be used in the improvement of rural housing[24].

In the current 1984-1988 Development Plan Period, the
Government admits that there is generally inadequate data on
the state of rural housing. The primary responsibility for
rural shelter improvement will, however, continue to lie with
the rural households themselves[25]. Since the majority of the
Kenyan population live in rural areas, the improvement of housing
in such areas is of prime importance. Therefore the need
for a thorough analysis of housing improvement must be stressed.
The government, on the other hand, is committed to continue
providing rural home improvement loans and intensify the promotion
of appropriate environmental enhancement measures within the
rural habitat.

In the rural areas there is no shortage of houses as
such, but there is need for upgrading because there is a trend
towards a demand for modern housing by the rural dwellers.
It should be realized that housing policy can only be meaningful
if it is a directive, statement of objectives helping in the preparation
of housing development programmes. In the overall development
strategy, housing policy statement must consider the role of
housing in social development planning, in increasing
employment opportunities, in generation and regulation of economic
activities, and in the redistribution of the country's population.

The national housing policy should consider the demand
and need for housing. In Kenya, for example, to satisfy the
demand for houses in urban areas or centres, the government
need to build 85,000 houses every year. Whereas in the rural
areas, 250,000 houses every year should be constructed in
order to improve the housing conditions in such areas.

This is far from being achieved as the Ministry assigned the role of housing development is hardly building 1% of the required houses each year and is therefore 20 years behind the need[26].

Housing Policy Formulation

A housing policy formulation process requires a systematic method of collecting and using information on people's housing needs and on the national housing situation. The process to be followed in the policy formulation involves analysis of the past performance and making predictions for the future housing needs and population growth trends considering the acceptable occupancy rate and the number of living rooms in the existing housing stock. This information should be used for policy formulation, programme implementation and for assessing the social consequences of housing standards, the social impact of specific housing programmes and progress towards social goals. The information gathered should help in the formulation of objectives and permit the identification of target groups requiring special attention. This is then followed by drawing a housing plan and preparing detailed housing programmes for implementation.

There are two complementary methods by which policy-makers can gain information. The first is the use of social indicators for housing which supplement popular choices because they offer a quantitative assessment of the overall housing situation and the impact of programmes. Social indicators can include the assessment by residents of the impact of housing programmes and of their satisfaction with various

aspects of housing. The second method is the encouragement
of residents to formulate their own requirements and goals
through active participation in the policy formulating process.
Popular participation is perhaps the basic source of feedback
because people themselves are ultimately the experts in formula-
ting their own requirements and priorities. This last approach
can be applicable in rural areas where people are free to
determine their own destiny by deciding on their own
requirements and priorities.

The two approaches have distinct advantages and both
are indispensable for the effective review and reformulation
of policies. The use of social indicators to improve the information
base for decision-making and social policy has become widespread.
Traditionally, economic measures such as the Gross National
Product (GNP) were used to infer improvements in living
conditions. These measures, however, proved inadequate as
measures of welfare and of the level of living conditions.
Governments and research institutions have looked more carefully
towards social indicators to provide better measures for the
quality of life. Social indicators and the purposes underlying
their use, make them ideal tools in the formulation of housing
policy. The purpose of social indicators is to make empirical
information available in a form useful to the formulation of
housing policies that reflect the social aspects of housing. This
process includes the setting of goals and standards and the
formulation of specific housing programmes to improve living
conditions.

Policy formulation is an intellectual undertaking. Realities such as available resources have to be weighted and priorities considered. The outcome may be a policy calling for incentives and disincentives as well as specific guidelines for programmes. Whatever the form policy formulation takes, it is particularly important since it determines the basic character of subsequent programme preparation. The very nature of the policy selected determines the programmes which serve as a vehicle for attaining goals. However, if no due consideration is taken, there may be inconsistencies between policies and the resources allocated to carry them out, that is to say, inconsistencies between objectives and results.

In the formulation of housing policies that reflect the social goals of redistributing resources in favour of low-income groups, a number of countries emphasize rural housing and the improvement of rural settlement. In Kenya, factors that affect the formulation of housing policies are national development programmes which are measured in terms of per capita gross domestic product and gross national product, and policies related to urban and regional development, rural development, industrial development, and fiscal and monetary policies.

Central governments usually formulate or coordinate national housing policies. Regional and local government usually implement the various housing policies and programmes devised at the national level. In Kenya, the implementation of housing development programmes as outlined in the various development plans is undertaken by the existing agencies such

as the Housing Department of the Ministry of Works, Housing
and Physical Planning which formulate, review and modify
policy and programme implementation guidelines for shelter;
National Housing Corporation (NHC); Housing Research and
Development Unit (HRDU) at the University of Nairobi;
Local Authorities; Housing Finance ..institutions; Private
Developers; and National Cooperative Housing Union. The
Housing Department, among the implementing agencies, has
also the responsibility of preparing the National Housing
Programmes, designing guidelines for its implementation, and
coordinating the activities of all implementing agencies besides
financing and programming of housing. Coordination of these
multi-level effects is therefore necessary and can be advanced
through widespread mutual understanding and knowledge of
the housing objectives to be achieved, as well as through
particular policies.

The last section of this Chapter discusses the role of
National Housing Corporation and Housing Finance Company
of Kenya as housing implementing agencies in the government's
constant struggle in finding ways of increasing the housing
stock.

<u>The Role of National Housing Corporation (NHC)</u>

The Central Housing Board

In 1943, the colonial government introduced a Bill in
Parliament which was passed as the Housing Ordinance. The
Ordinance set up a Central Housing Board with funds from
the government to be lent to local authorities for the provision

of housing. Briefly, the functions of the Central Housing Board were to build housing directly and to make loans for housing to other local government authorities. This marked the beginning of the provision of public rental housing in the major urban local authorities. The Board was therefore created to direct and coordinate housing provision in the urban centres.

The Board assisted the local authorities with the preparation of plans and documents and with the supervision of work on the ground. The Board tended to favour tenant-purchase schemes, in which the houses were built by the Local Authority and the tenants purchased them from it over a period of time. The biggest demand on the Boards funds was for loans for rental housing, and it was the aim of the Board to keep building costs low as was compatible with sound design and construction in order that economic rents for them are within the means of the lower income group.

The Board also made loans to local authorities for site and service schemes using a prototype plan and then local authorities were to repay to their share of the cost of the site development. Other loans made by the Board to local authorities were for lending to employers to enable them build housing for their employees. Within ten years after the establishment of the Board, Nairobi constructed 12,000 units, Mombasa constructed 2,000 units, and Government Departments provided 7,710 quarters throughout the country. Houses completed directly or indirectly by the Central Housing Board between 1960 and 1967 were 6,789 units which costed

K£2,378,389[27].

After the recommendations by the United Nations Mission
to Kenya on Housing in 1964 and the formulation of the first
Housing Policy for Kenya as contained in the Sessional Paper
No. 5 of 1966/67, the Central Housing Board was transformed
to the National Housing Corporation (NHC) as of July 1967.
The principal reason for the transformation was that the latter
should be a separate Corporation more independent of the
Ministry of Housing, and able to give support to a wider field
than just to local authorities and to undertake projects of its
own.   The function of the Corporation was to include the management
of the housing fund which at the time was operated by the
Central Housing Board.

Aims and Objectives of NHC

The National Housing Corporation was established in
1967 by an Act of Parliament, The Housing Act, Chapter 117
of the Laws of Kenya as a body playing a dynamic role in
providing funds and technical assistance for a progressive
low cost housing programme for the whole country.   The
Corporation is the government's chief agency under the Ministry
of Works, Housing and Physical Planning through which public
funds intended for the low cost housing are channelled to
local authorities, housing cooperatives, and other housing
development organisations.   In an effort to achieve the
government's housing objectives, the Corporation is charged
with the implementation of government housing policy through
undertaking the following activities:

(1)   The Corporation acts as an agency for transmitting loans from the Ministry of Works, Housing and Physical Planning to Local Authorities for the development of low cost housing in towns and to individuals in the rural areas for the development of housing in their farms and homes.   The Corporation provides loans to local authorities for rental housing and tenant-purchase housing schemes.   As for loans to individuals in the rural areas, the Corporation is operating Rural Housing Loan Scheme where . those in the rural areas and are interested in improving their housing conditions can get financial assistance.   For this particular function, the Corporation maintains direct communication with local authorities and keeps close link with non-governmental organizations with a view to fostering and encouraging housing development in the private sector of the economy.

(2)   It provides technical assistance in the form of designing, tendering, and supervising construction for those local authorities inadequately staffed with the necessary technical personnel.   It therefore demonstrates building techniques and takes a close interest in the development of the building industry.

(3)   In a number of cases the Corporation develops and manages housing either in order to supplement the capacities of the local authorities concerned or meet the demand for houses in areas where local authorities are unable to initiate and/or manage housing estates themselves.

(4)   The Corporation in collaboration with the Housing Department of the Ministry responsible for housing development and the Housing Finance Company of Kenya Limited, undertakes to stimulate greater participation by the private sector by

developing mortgage housing estates with mortgage loans being
provided by Housing Finance Company of Kenya. The Corporation
therefore acts as an estate developer for mortgage housing
schemes for the middle income groups of the population which
is not catered for by the private sector.

(5) The Corporation undertakes and encourages research
and experiment in housing related matters, and undertakes
and encourages the collection and dissemination of information
concerning housing and related matters. In this responsibility,
the Corporation works closely with the Housing Research and
Development Unit (HRDU) of the University of Nairobi.

Apart from the stated functions, the Corporation takes
part in housing exhibitions and other forms of publicity, under-
takes and encourages the provision of training in furtherance
of the purposes of the Housing Act and provides for the training
for members of its staff.

The Housing Act which established the National Housing
Corporation also provide for loans and grants of public money
for the construction of dwellings intended for residential
accommodation. It also established a Housing Fund under the
control of the National Housing Corporation.

Sources of funds for NHC

The National Housing Corporation to perform the various
tasks assigned to it must have funds for the functions. The
main source of funds for the Corporation is the government.
This include all funds which from time to time may be voted
or appropriated by Parliament for payment into the Housing

Fund. This has to be decided upon by the Ministry of Works, Housing and Physical Planning from whose vote the Corporation is expected to have its share for the purposes of participating in housing development.

Funds can also be got from the repayments of principal and or interest made by any local authority, company, society or individual person, on account of any loan already made by the Corporation. Funds can as well come from any investment made by the Corporation from time to time as they become due.

Lastly, the Corporation being a legal entity has got power to enter into contracts with other bodies for purposes of borrowing money to be used in the implementation of the housing programmes. The Corporation can therefore receive external funds for the purposes of achieving its objectives. All these sources of funds for the Corporation are provided for in the Housing Act (Chapter 117 of the Laws of Kenya).

The National Housing Corporation is already providing technical assistance to local authorities in the form of design and/or supervision over the construction of low cost housing and manages housing estates in those cases where there is lack of capacity in the local authority concerned. It is also undertaking construction of tenant-purchase housing outside Nairobi in smaller municipalities with loan from United States Agency for International Development (USAID) and mortgage housing at the middle level with loans provided by Housing Finance Company of Kenya. Areas where the Corporation had undertaken housing projects are Kakamega, Eldoret, Nanyuki,

Kisumu, Nyeri, Nakuru and Mombasa among others in an attempt
to alleviate housing problem in the urban centres. Considering
the financial constraints and high costs of constructing houses,
the National Housing Corporation has succeeded in increasing
the housing stock since its inception in Kenya's urban centres
although the housing units are far from being adequate. The
Corporation has constructed a total of 40,438 housing units
at a cost of K£56,865,146 as from 1965 to 1984[28]. Out of the
40,438 housing units, site and service schemes are 19,028
units at K£16,877,971, rental housing units are 11,858 at
K£16,291,916, tenant-purchase housing units are 7,733 at
K£11,385,202, and mortgage housing units are 1,819 at
K£12,310,055[29]. At the end of December, 1984 there were 12
housing schemes under construction consisting of 4,826 units
at a total cost of K£11,303,757[30]. During the same period,
end of the year 1984, there were a total of 51 housing schemes
under planning stage, consisting of 7,498 units at an
estimated value K£25,461,875.

 This study concentrates on how the National Housing
Corporation has been participating in financing individuals
in rural areas through the Rural Housing Loan Scheme. The
Corporation provides loans to individuals in rural areas to
enable them to build permanent houses on their farms.

The Rural Housing Loans Scheme

The Rural Housing Loans Scheme was instituted to help individuals in rural areas build decent houses. However, the government has maintained that the initiative for house construction in rural areas lies with the rural households themselves. There are conditions governing granting of loans to individuals for constructing houses in rural areas set by the National Housing Corporation. These conditions are:-

(1) A completed application form which can be supplied by NHC on receipt of a fee of Kshs. 150/- either in cash, money order or Banker's cheque.

(2) The applicant must be a Kenyan citizen over 18 years but under 50 years in age provided at redemption the applicant would not be over 55 years.

(3) A copy of the National Identity Card or passport to prove the applicant's age.

(4) The minimum loan that can be applied for is K£500 and the maximum is K£4000.

(5) Maximum loan granted should not exceed 50% of the estimated cost of construction or K£4000 which ever is lower. The loan granted should not exceed applicant's two years gross income.

(6) Loan monies will be released to the applicant when one has done 50% of the construction provided the loan is secured.

(7) Applicant must supply proof of income in either of the following forms:

a) A letter from the employer (if employed) confirming gross annual income.

b)   Audited financial statements for the past
2 years (if in business).

(8)   Repayment period of the loan is 5-10 years.

(9)   The applicant's passport size distinct photograph;
2 copies of the building plans of the proposed
house, and a photograph showing the stage of
construction of the house.

(10)   Applicant's confirmation that he has chargeable
property in either of the following forms:-

a)   Title deed of the land on which the house
is built or any other tilte deed available
provided it is valued at the applicant's cost.

b)   Any chargeable property available.

c)   An insurance policy which may be assigned
to the Corporation (provided the surrender
value is higher than the loan granted).

d)   Any other form of tangible security acceptable
to the Corporation (for example, share
certificates from reputable companies).

e)   In exceptional cases the Corporation may accept
a reputable personality to guarantee the loan
provided the loan to be granted does not exceed
K£2000.

(11)   Loans will only be granted for construction of private
residence in rural areas (not for commercial buildings).

(12)   The Corporation is not bound to give loan to every
applicant who qualifies.

Since 1967, the Corporation has advanced housing loans
to 5,789 individuals in the rural areas upto 1985, with 5,150
individuals benefitting between 1975 and 1985[31]. The total amount
of money advanced to these individuals is K£8,243,077.
However, there has been great variation as to the number of

people who have benefitted from the scheme as per the districts. For instance, out of 5150 individuals financed between 1975 and 1985, 6.3%, 6.5%, 13%, 9%, 9.4%, and 0.4% came from Siaya, South Nyanza, Kiambu, Kitui, Kakamega and Nyandarua Districts respectively. Considering the total number of people who have been advanced loans and the total number of Kenyans living in rural areas, it is clear that the scheme has not succeeded in helping the majority of Kenyans to provide themselves with decent housing necessary to raise the people's standards of living and curb diseases.

The Rural Housing Loans Scheme is quite popular with the people as it has attracted a great number of people all over the republic. The people in the rural areas should also be given assistance to build good houses inorder to live decently. However, the rural housing loans scheme tends to favour the rich in the rural areas and not the poor. Under the scheme, loans can be granted to applicants who are credit worth, and in the case of unemployed applicant, repayment is restricted to not more than 5 years and the applicant must, in addition to producing a land title deed, also produce someone of means and good reputation whose annual income is not less than a half of the amount of money borrowed, to enter into Loan Agreement as the applicant's surety. The applicant must be able to amortise the entire loan before the age of 55. The applicant has also to pay a fee to cover both legal and inspection costs. The ceiling for loans to individuals is Kshs.80,000 and the amount that can be released cannot exceed 50% of the estimated cost of construction. The procedure followed in processing of Rural Housing Loans by NHC is given in appendix 4.

One therefore finds that a great percentage of the rural population cannot secure a loan from the Corporation because of any or a combination of the following reasons:-

a) inability to afford the necessary down payment to enable the applicant to construct over 50% of the house before the applicant can be considered and funds allocated. Such a requirement, particularly when the house to be constructed is permanent cannot be easily met by the rural poor.

b) low income, or low earning power, makes it virtually impossible for the people to afford the monthly repayment rates. The Corporation should be flexible in lending to rural borrowers allowing farmers to borrow money for building good houses and repaying slowly. The monthly schedule concept of the industrialised society is not suitable for the Kenyan farmer whose income is seasonal but substantial.

c) inability to provide a reliable surety or guarantor acceptable to the Corporation. The low income loan applicants should be considered by the Corporation for loans without being asked to provide title deeds or security because sometimes they clearly do not have either.

There is also age limitation of 55 at the expiry of the loan. At the age of 55 is when people working in urban centres retire from employment and are prepared to start life in the rural areas. Therefore such people need assistance inorder to construct decent houses.

In reality, the loan scheme is out of the reach of the common people. It has become, by design and by default, a loan scheme for the middle class constructing houses in rural areas. The effort so far made by the public sector through NHC has produced only a meagre part of the total requirements of the housing in the country. However, in an effort to finance individuals in rural areas, the policy makers should be able to understand the economic realities of the rural areas.

The Corporation, on the other hand, in attempting to achieve the objectives under Rural Housing Loans Scheme is faced by resource constraints. The Corporation's good work is being hampered by shortage of funds as the money set aside for the Rural Housing Loans Scheme is inadequate. The Ministry's allocation to the programme is only Shs.10 million a year whereas about Shs.100 million is needed to provide decent houses every year. The shortage of funds is not the only problem facing the Corporation. The Corporation also faces the problem with implementation of the programme as concerns the collection of the repayment loans from the individual loanees. The rate of defaulting which is a percentage of monthly schedule payment arrears to the money due for repayment is quite high. As at September 1985, rate of defaulting was 63%. The high rate of defaulting is attributed to laxity on the part of loanees because of lack of title deeds as security for loan procurement for those who got loan without depositing security to the Corporation. The Corporation should see into it that beneficiaries repay their loans so that other

people can also benefit.

The Role of Housing Finance Company of Kenya Limited

Housing Finance Company of Kenya (HFCK), the largest mortgage company in Kenya, was incorporated in November 1965 as a national mortgage Company with the main objective of implementing and supplementing the government policy of promoting thrift and home-ownership by providing savings and mortgage facilities to the Kenyan public. It was found through an agreement between the government of Kenya and the Commonwealth Development Corporation of Great Britain. On incorporation of the company, the equity was held as to 60% by CDC and 40% by the Government of Kenya. From the policy point of view its formation was an attempt by the government of Kenya to encourage private sector involvement in housing which had been greatly ignored by the colonial administration. Initially the operation of the company was restricted to the zoned residential areas within the city of Nairobi and Mombasa Municipality. Now its operations are countrywide within major urban centres.

To date the company gets its funds from the shareholders, the CDC and the government of Kenya in the forms of equity and loans, and also from public deposits. Initially, estate development was disappointing especially because there was hardly any private developers who could handle sizeable developments. The company had therefore depend on NHC, which had been established for that purpose. On January 1, 1970 the Kenya Government increased her shareholding to 50%

thereby becoming an equal shareholder w th CDC in the HFCK.

Objectives and Functions of HFCK

HFCK is the national mortgage institution established
to promote thrift and home-ownership by individual members
of the Kenyan society and play a major role in the country's
efforts in pursuit of shelter.

The ultimate objective of the Company is to improve shelter
conditions of the people in the country and continuously assist
in increasing the country's housing stock[32].   Its principal
tasks therefore, are to provide finance, assistance in project
preparation, guidance as well as management expertise needed
to develop housing units within the country with the overall
effort directed towards individual home-ownership and
deliberately designed to avoid financing landlords.   This is
done through both the sponsoring of estate developments geared
towards eventual sale of the housing units to individuals and
with the Company providing mortgage finance to the
individual house buyer as well as through assistance for
individual house construction.   In both cases the Company's
input runs right through the whole process from planning to
the provision of end finance but in the case of the construction
of a house by an individual there are facilities whereby
financing is done in stages as construction work progresses.
Besides, facilities are available for the purchase of already
existing housing units.

Lastly, the Company seeks to encourage and promote
the flow of savings both private and public into financing
home-ownership through provision of savings and deposit

facilities as well as such other services as the acceptance and administration of provident funds.

The HFCK achieves its objectives by, firstly, offering attractive investment facilities, and secondly, providing mortgage loans to Kenyans to acquire their own houses, normally ranging from Shs.22,500 to Shs. 600,000 per family. The loans are normally available upto 90% of the purchase price or valuation assessed by HFCK, whichever is lesser sum.

The savings investment facilities by HFCK can be summarized into two main headings namely, Savings and Deposit Accounts, and Housing Development Bonds designed to provide a vehicle through which savings are specifically channelled into housing while giving very attractive returns to investors. The Savings Account operates in similar ways as any savings account of various financial institutions.

Although HFCK does not directly undertake any development of housing estates, it is very much involved in housing estate development firstly as a facilitator of the developments by guaranteeing availability of end finance to the prospective house purchasers and, secondly by actually providing mortgage finance to the house purchasers who require and qualify for the finance. Over the years the Company has endeavoured to work towards its main objective of providing mortgages to Kenyans wishing to acquire their own houses. Altogether the Company has made it possible for approximately 15,000 families to be housed directly in addition to many more housed indirectly through the local authorities.

The role of HFCK in housing finance cannot be underestimated because with the available resources, the Company has been advancing mortgage facilities to individuals who meet the Company's conditions. However, the Company has mainly concentrated on housing for the medium and high income groups in urban areas. In the overall housing development in Kenya, HFCK is greatly contributing towards increasing housing stock in the struggle to alleviate the housing problem in urban areas.

It is however felt that the Housing Finance Company of Kenya should not concentrate on Nairobi, Mombasa, Kisumu and other urban centres but should go out and serve people in the rural areas. This can go along way in helping the government achieve the housing objective of providing every Kenyan with a decent house. The company should therefore diversify its operations to cover rural areas.

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CHAPTER 4

ENVIRONMENT, BUILDING CUSTOMS AND HOUSING IN SIAYA

Introduction

This Chapter discusses the general characteristics of Siaya District, the study area, in relation to housing pattern, organization and provision. The Chapter considers the district's physical condition and environment; land use and its potential; the district's economy; population growth and its structure; the available building materials and building practices; and lastly amenities and services such as water resources, transportation facilities, health and educational facilities which are essential for the improvement of living standards of people if provided together with decent housing.

Siaya District is within the Lake Victoria basin which is a part of a well-watered lacustrine environment which extends into Uganda and Tanzania. The district is distinctly occupied by the Luo Community. The Luo first entered the area around the lake as far back as the 16th Century but these were incidental groups that did not permanently occupy the region[1]. This followed the movement of the Luo's from Sudan along the River Nile into Uganda and finally into Western Kenya. The Luo's permanent occupation in the region started from the 18th and 19th Century onwards when the Luo's dislodged the Bantu groups. The area was originally occupied by the Abaluyia groups who had migrated into the region during the 17th and 18th Century from the present-day Uganda. The Luo's therefore settled in the Nyanza area occupying the areas of the present

Siaya, Kisumu and South Nyanza Districts. Their settlement
was in dispersed homesteads of varying sizes which contained
separate dwelling units for the various members of the
extended families. The families were organized along patrilineal
lines which consisted of a nuclear family, that is, man, wife
or wives and young children, married sons and their wives
and children and sometimes other relatives[2]. In most parts
of the district the dispersed pattern of settlement consisting
of these individual homesteads still prevails. However, nowadays
the Luo homestead differ in size and composition according
to characteristics of the household and the quantity of land
available. In a family there may be several houses. The man
and his wife live in one house, and in case of a polygamous
household there is a house each for the wives, a house each
for the married sons and usually one house for the grown-up
unmarried sons.

In the early years of their settlement, various families
grouped together into clans living in villages. The Luo
settlement is usually surrounded by a hedge of planted
Euphorbia. This shrub grows to a height of 10 metres and
gives a good protection against intruders. The Luos at the
time of migration were subject to attacks from the people they
had pushed out[3]. Therefore in order to protect themselves,
they dug moats surrounding settlements. The houses in the
villages were arranged in circular manner with only one entrance
from outside. The size of settlement varied according to the
number of houses. The houses were scattered around the perimeter
at a distance of 3 to 5 metres from it. They formed an

enclosure where cattle were kept at night to keep off cattle
rustlers. In some settlements, the cattle enclosure was an
independent unit at the centre.

The traditional houses of the Luos were round. The
houses had round plan and were free standing with diameter
equal to or greater than height, with walls of mud and thatched
conical roof[4]. However, for houses recently constructed, the
new architectural style is rectangular. This is becoming
necessary when they turn from grass thatching to iron sheets.

Location and Physical Features

Siaya District is one of the four districts comprising
Nyanza Province of the Republic of Kenya besides Kisumu, Kisii
and South Nyanza Districts (Fig. 4). It was created after splitting
the former Central Nyanza into two districts, that is, Kisumu
and Siaya. In terms of size, the district is the second largest
in the province, the first being South Nyanza District. It
occupies a total area of 3,528 square kilometres of which
2,523 square kilometres is land area and the remaining 1,005
square kilometres is the area under water[5]. The whole Nyanza
Province covers an area of 16,162 square kilometres of which
12,526 square kilometres is land area and 3,636 square
kilometres is water area. This means that Siaya District
occupies about 21.8% of the Province. In terms of hectares,
land area in Siaya District is 252,300 hectares out of which
only 175,600 hectares have been registered under the Registered
Lands Act (Chapter 300 of the Laws of Kenya)[6].
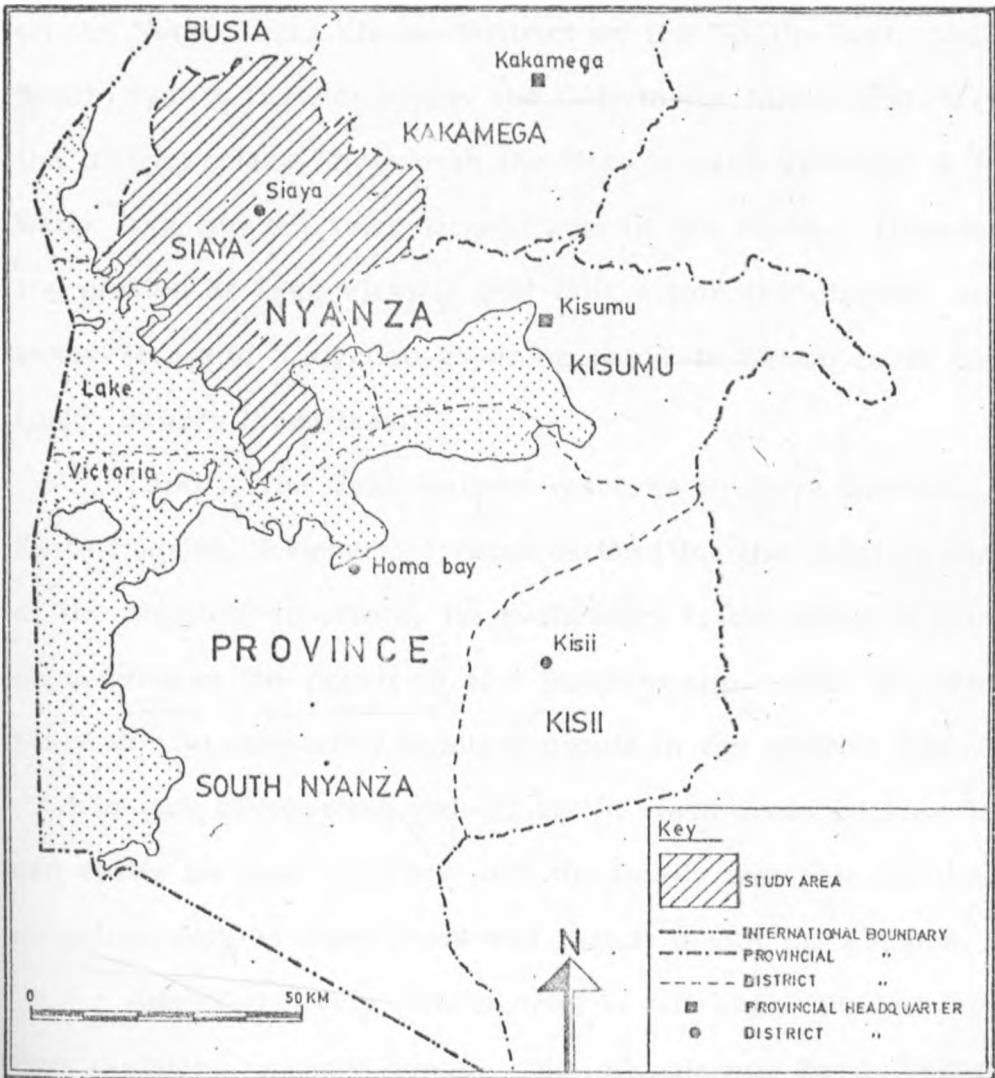
Fig. 4 -- Map of Nyanza Province showing the position of
the Study Area, Siaya District.

The location of the district extends from Latitude 0° 13' South to 0° 18' North and from Longitude 33° 58' East to 34° 33' East[7].

In its regional context, the district is bordered by four districts namely, Busia District on the North, Kakamega District on the North-East, Kisumu District on the South-East, and South Nyanza District across the Gulf to the South (Fig. 5). Bordering the district's land surface on the West is Lake Victoria, a fresh water lake and the third largest lake in the World. Therefore the portion of Lake Victoria that falls within the district, and Lakes Sare and Kanyaboli adjoining the Yala Swamp cover the 1,005 square kilometres.

Land is the major natural resource in Siaya District. Since housing development requires land for the construction of the physical structure, its availability is therefore of prime importance in the provision of a building site. The fact that there are no completely landless people in the district may well explain lack of homeless individuals in rural areas because land can easily be used together with the locally available building materials such as bush poles and thatch to put up a house.

Administratively, the district is currently divided into four divisions, namely Bondo, Yala, Ukwala and Boro; twenty four locations and one hundred and thirty-five sub-locations. These sub-divisions are only meant to ease administration procedures and improve on the efficiency of the government officials by having areas under their control which are not unnecessarily big.
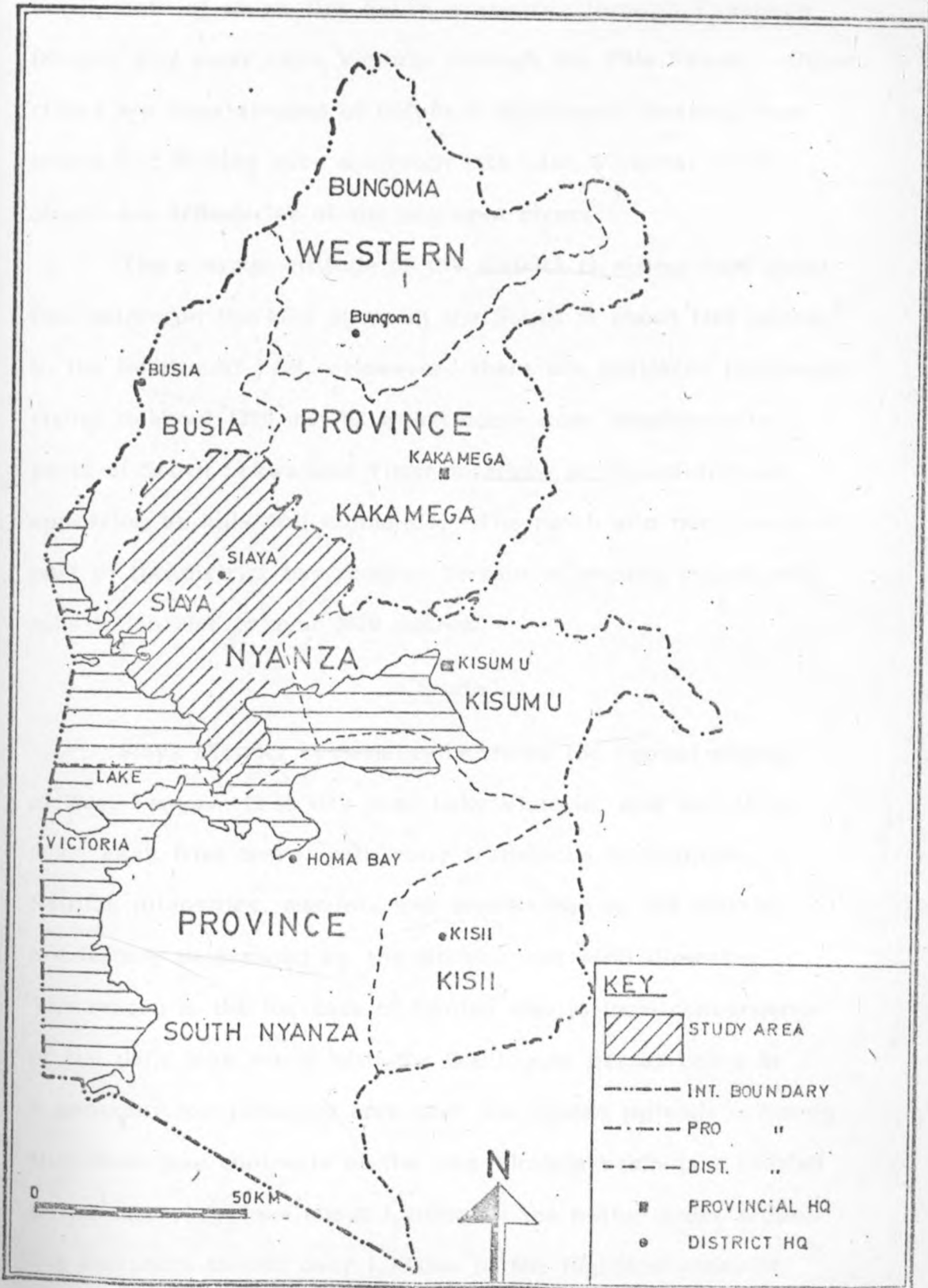
Fig. 5 - Map of Western Kenya showing the Study Area,
Siaya District in the Regional Context.

The District is traversed by two main rivers, Yala and
Nzoia, both of which flow South-westwards through Kakamega
District and enter Lake Victoria through the Yala Swamp. Other
rivers are mere streams of only local importance starting from
inland and flowing over a stretch into Lake Victoria, while
others are tributaries of the two main rivers.

The average altitude of the district is rising from about
1140 metres on the lake shore in the South to about 1300 metres
in the North and East. However, there are scattered highlands
rising to about 1280 metres which occur near lakeshores in
parts of South Sakwa and Yimbo locations in Bondo division,
appearing as hills and highlands. The north and north-eastern
part of the district has rougher terrain of sloping ridges and
hills which rise to over 1420 metres.

Climate

Siaya District systematically shows the typical zoning
of West Kenya. It is dry near Lake Victoria, and wet about
50km away from there, with many transitions in between.
Rainfall intensities, amounts and distribution in the district
are largely determined by the altitude and wind direction.
The reason is the increase of rainfall due to local convergence
of the daily lake winds with the South-east passat being in
a generally low pressure area over the heated uplands. Among
the distinctive contrasts of the lake Victoria basin is a rainfall
pattern varying from about 1,016mm in the hotter areas around
the lakeshore to well over 1,778mm in the highland areas of
the eastern portion. The highlands in the north of the district
receive higher rainfall of convectional and relief type while
the lower areas in the centre-west and in the south of the

district receive lower rainfall, mainly of convectional type.
Thus, annual average rainfall increases from 800mm at the
lake shore to 2,000mm near the border of Kakamega District.
The lake shore areas have a minimum expectation of about
509-889mm of rainfall. Normally the long rains are received
between months of March and May, and short rains between
months of September and December. Both rain periods are
well distinguishable upto 25 kilometres away from the lake,
although the peaks are not very well pronounced. However,
the start of the second rains is somehow difficult to define
the more the north-eastern part of the district is approached.
This is because of the middle rains becoming bigger as a result
of the convergence.

Temperature ranges vary between 10° and 32°C, with
a mean minimum of 16.1°C and mean maximum of 30.8°C.
Near Lake Victoria the annual average temperature is about
22.5°C, and in the north-eastern part of the district, it is
21°C. Humidity of the air is relatively high. For the entire
district, evaporation is 1800-2000mm per year.

The type of rainfall patterns and the temperature ranges
are supposed to influence housing provision in the district.
However, the two phenomena are not creating constraints in
rural housing provision because of the available roofing material,
thatch. Thatch, if properly and skilfully laid is capable of
providing necessary barrier to rain seeping into the house
during the long rains besides providing cool internal
environment during hot temperatures. The high temperatures,

on the other hand, need reasonable wall thickness to maintain
the internal environment with acceptable level of thermal
comfort.   As for the wall thickness, mud as a building material
is capable of being moulded to the required size and at the
same time it has a very high heat and thermal insulating value
that enables it to keep the inside of buildings cool when the
outside is hot and vis-a-vis thereby creating a comfortable
living environment in houses.

Land Use and Land Potential

Siaya District has a total agricultural area of 164,263
hectares divided into four agro-economic zones.   First, there
is high potential zone covering an area of 52,275 hectares.
This is mainly in Yala and Ukwala Divisions and part of Boro
Division.   This high potential zone has good prospects for two
crop seasons and is capable of giving economic yields of maize,
millet, cotton, sorghum, groundnuts, sugar cane and coffee.
Because of the various crops that can be grown in the area,
the soil types and conditions are expected to vary from region
to region to suit the growing of the various crops.   This upper
agro-economic zone is higher in altitude than other areas in
the district, cooler and wetter most of the months of the year.

Secondly, there is medium potential zone covering an
area of 82,220 hectares.   This zone is widely spread among
all the four divisions of the district.

Thirdly, there is marginal zone covering an
area of 25,980 hectares and is mainly found in Bondo division
and the southern parts of Yala Division and to a smaller extent
in Boro and Ukwala Divisions.

The lower agro-economic zone comprising the medium potential zone and marginal zone is lower in altitude,, hotter and drier most of the year's months. The medium and lower potential zones have only one crop season with maize, sorghum, cotton, and root crops featuring as the main crops. Due to comparatively harsh conditions in the drier lake shore areas, economic activities have long been concentrated on lake shore. Fishing and crop farming have been practised mainly at subsistence level within a predominantly bushy environment. However, where bush clearing has been intensified, this southern area has shown substantial agricultural potential especially with respect to cotton growing.

Lastly, there is the range and desert zone covering only some small area 3,788 hectares in Boro Division[8].

In the district, average size range of farm holding are 1-20 hectares in Bondo Division, 1-4 hectares in Yala, 1-6 hectares in Ukwala, and 1-9 hectares in Boro Divisions. Compared to the neighbouring districts, particularly Kakamega, these are reasonably large holdings, but this resource has not been fully utilized. The land potential is reflected in the ecological contrast between the lake shore Savannah and the intermediate high rainfall Savannah area which enjoy higher and more reliable rainfall. The distribution of high potential land shows that most of it is found in the better-watered areas.

Siaya's Economy

The district is chiefly an agricultural area. The subsistence economy of the area is dependent mainly on agriculture in the higher and wetter areas and the keeping of livestock in more open areas of the lakeshore and the plateau grasslands of the area. The first attempt to diversify the economy began with the establishment of the peasant-grown cotton in the region in-1930s within the frameworks of the then existing systems of land tenure. The introduction of cotton as a cash crop in the cotton belt started the new era in the agricultural practice of the people. The cotton belt covers the lower area surrounding the gulf, less than 1200 metres above sea level, forming part of the lakeshore Savannah ecological zone. Cotton is the major and so far the only important cash crop grown in the district. It is estimated that 3-4,000 hectares are planted annually yielding between 220 and 500 kilogrammes of seed cotton per hectare. In the better cotton zone, ninety per cent of the crop is interplanted into maize. In the district, the main cotton areas include the greater part of Bondo Division - Sakwa, Asembo, Yimbo and Uyoma and West Alego.

Another cash crop gaining in importance is sugar cane, although the generally low soil fertility within the district makes sugar cane growing costly. Some parts of the district, notably Uyoma and Gem have developed groundnuts and coffee as an export respectively. Extremely low yields and little input level characterise the farming system.

Most people practise a non-cash subsistence agricultural economy even in the high rainfall region. Agricultural activity is based largely on production of the staple food crops such as sorghum, maize and millets depending on altitude and rainfall pattern. In addition to the above staple cereals, cassava has recently been increased as an important famine relief crop in response to the present agricultural policy. Practically all food produced is consumed locally. Although the region is capable of supporting a wide range of crops, the traditional economy places emphasis on the basic subsistence crops. However, there is considerable potential for output increase but a lasting improvement in soil fertility requires the introduction of a proper mixed farming system and the use of increasing amounts of fertilizer. The result of subsistence agriculture is that most people are financially unable to adequately invest in modern farming technology, leave alone improving their housing conditions that would help raise their living standards. Buying modern building materials such as corrugated iron sheets for roofing, and cement for wall plastering requires substantial funds which cannot be easily raised within the subsistence rural economy. This is true as evidenced from the District Data sheet records. Total farm crop earnings for the district in 1982 was Kshs. 362,231,734 reflecting an average income per capita of Kshs. 616/78[9].

The fact that Siaya District is an agricultural area becomes clear from the high percentage of people in the district depending on cultivation of land as a source of earning

their livelihood. Among the other economic activities of the
area is fishing. This activity is one of the main pillars of
the subsistence economy, but it is also an important part
of the modern exchange economy which affects the economic
opportunities in the area around the lake. Although the
traditional fishing economy depends on a wide range of
fish species, commercial fishing is largely concentrated on three
species of Tilapia Esculenta, Tilapia Variabilis, and the Nile
perch.

Although the District Development Plan 1984-1988 does
not provide information about the distribution of the labour
force over the various types of industry, it is known that the
relatively small population in wage employment is chiefly found
in government services, mainly officers in health, administration
and education. For example, according to the figures given
in the Statistical Abstract 1984, only 7,454 persons were in
wage employment in the district in 1983 of the total number
of 90,453 in the whole of Nyanza Province. This forms only
8.24% of the province's labour force in wage employment. The
7,454 persons were only an increase of 3,055 people since
1975 when only 4,399 persons were in wage employment in the
district. Compared to other districts in the same year, Siaya's
figure was relatively low. For example, the number of people
in wage employment were 38,598 in Kisumu, 25,278 in Kisii,
74,469 in Kiambu, 37,272 in Machakos and 31,653 in Kakamega.
The district in the same year earned only K£5,497,400 in contrast
to Kisumu's K£31,886,900, Kisii's K£15,456,800, Kiambu's K£42,833,600,

Machakos' K£27,006,200 and Kakamega's K£23,553,000. From the district's earnings, it can be seen that the district suffers from low incomes.

In addition, wage employment includes the employees of the Siaya County Council. The self-employed outside the wage employment are mainly active in trade, transport and fishing along the lake shore areas. These employment figures indicate insufficiently the magnitude of non-farm activities for the rural households in Siaya District. The scope of generalizations regarding the place of the fishing industry in the total economy is limited. Due to the individual and scattered nature of traditional fishing, figures are lacking for the total number of persons supported by this industry and the actual output[10]. However, at national level, statistics reveal that in the monetary economy, fishing industry contributes 0.2% of the total gross domestic product at constant 1976 prices in years between 1978 and 1983. In 1983, the contribution of the fishing industry was K£5.53 million out of the total gross domestic product of K£1,800.76 million. This included the contribution of both the traditional and monetary economy.

There are a few important conclusions relevant to housing conditions which can be drawn from the discussion of the various economic activities of the rural households of Siaya District. Agriculture is the source of income for the vast majority of the district's population. Despite this sector's share in the District's total product, the monetary income obtained from the largely subsistence agriculture is low for most

households because of lack of cash crops like coffee and tea.
The absence of adequate opportunities to earn an income from
agriculture stimulates off-farm employment such as fishing.
The highest monetary income is offered by permanent
non-agricultural employment within the district which only
a small proportion of the rural population has access to.
Those persons unable to secure a living in the district, migrate
to big urban centres to look for work and their remittances
are an important source of money for many households in order
to purchase the basic necessities. The annual rate of
emigration for Siaya District during the 1979 census was
recorded as 4.6%[11].

The low income levels of the rural households in the
district may be the cause of the existing housing conditions.
Most of the rural households, because of the low purchasing
power, resort to the use of locally available building and roofing
materials, especially thatch, which if not properly and skilfully
laid will leak under heavy rainfall downpour. With rain
seeping through the roof into the house, mud (which is the
most commonly used walling material), develops cracks, and
this reduces the life span of the average house. The low
incomes can at the same time not allow the households to invest
in other development activities, for example mechanised farming
methods, which could help raise the standards of living, leave
alone providing themselves with decent housing. The people
of the district therefore continue struggling for survival by
providing themselves with adequate food and clothing.

Population Growth and Structure

The third Kenya national census, taken in August 1969, recorded a total population of 10,942,705 persons, of which 98% were Africans and the remaining 2% comprised members of the Indian and European community among others. At the time of 1962 census, the estimated growth rate of the total population of Kenya was in the region of 2.5-3.0% per annum[12]. The period immediately preceding the 1969 census, the intercensal growth was 3.3% per annum.

According to the 1969 census, Siaya District's population was 383,188 persons, giving a population density of 151.9 persons per square kilometre[13]. However, the estimated annual intercensal population increase between 1962 and 1969 for the district was 2.3%. The percentage in population between the same period was 17.7[14].

At the time of the census in 1979, 474,516 people lived in Siaya District, giving a population density of 188 persons per square kilometre. The population showed an increase of 91,328 people (about 24%) over the 1969 figure. The annual population growth rate was therefore 2.38%. The district had 89,702 households. The district's population can be contrasted to other districts population, Kisumu's 482,327, Kiambu's 686,290, Nyeri's 486,477, and Kakamega's 1,030,887.

Out of the total district's population, only 1% lived in the two townships of the district. The rural population of nearly 470,000 had to share a total rural area of 251,700 hectares, that is, 0.39 hectares of agricultural land per person.

Of the four administrative divisions, Boro Division had the highest percentage of population increase between the two census years (1969 and 1979), while the rest increased in population by the same percentage. According to the Central Bureau of Statistics calculations, it is expected that an average annual population growth rate of 3.12% will be maintained for Siaya District throughout the current plan period, assuming that constant levels of fertility and mortality are maintained.

The major ethnic group in Siaya District is Luo. And according to 1979 population census, the Luo population in the district was 458,769 while those of other ethnic and racial origin accounted for only 1,801. Males between 15 years and above 55 years accounted for 102,500, that is, 47.7% of the total population.

Analysis of the population growth and its structure is necessary in housing provision. This is because housing is provided for the existing population and population projections help in determining the future housing need. The population is provided with housing units which are meant to accommodate members of each household. The population structure in terms of sexes and ages facilitates the understanding of volume of housing construction that might be required at a particular period of time. For example, it is quite unnecessary to plan for housing the females knowing very well that at maturity stage, they join other families because of the socio-cultural arrangements.

Building Materials and Construction Practices

Since time immemorial, man has used materials provided by the earth for building shelter against the weather, attack by animal predators and human enemies. The production and metabolic processes of shelter are the Key factors that affect the Man-shelter-environment relationship. The production processes involves the use of land and such natural resources as timber, stone, earth and water. The combination of land and the other materials create an internal environment which ensures a certain degree of thermal comfort, safety, privacy and occupancy, which in turn defines a set of external relationships with other groupings of shelter in respect to functions like work, social services and recreation.. The importance of building materials in all types of construction is very great, especially when considering that materials account for as much as 60% of the total costs of construction of domestic buildings.   It is necessary to understand that each of these materials used contributes in its own way to the structural strength, to the aesthetic appearance and to the performance requirements of a building.

The dry sub-humid and semi-arid areas of the district have a lot of grasses of different species and some trees. The vegetation varies from bushland to patches of forests. Seasonal building materials like grass for thatching grow following rainfall distribution patterns and are therefore more available during June, September and December. As for the roofing materials, pitched roofs are normally used where rainfall is fairly high and needs to be drained quickly. However, steeper slopes

perform better but average roof slopes in Siaya is 40°. The availability of different species of thatching grasses and reeds require different traditional skills which are related to the structural priorities of materials which tend to restrict the house sizes. The locally available building materials include:-

(1) Papyrus reeds which are about 2-5 metres long and are sometimes used in that length, or tied into band of 2 or 3 to form roof purlins and battens. The papyrus reeds if properly thatched with traditional skills has life span of about 15 years. Its exposure to weather might shorten the life span considerably due to rotting. It is a highly inflammable material and also capable of destruction by wood eating termites. It is locally available along the shores of Lake Victoria, for example, in Uyoma and Asembo locations of Bondo division, and also along the rivers. Due to its weight, it is normally used in the areas where it is locally available because of transportation problems (See Plate 3 where reed is replacing grass).

(2) Grass thatch is not durable. The life span of grass thatch extends between 2 and 10 years depending on the roof slope, frequency of rainfall, the species, experience and skill with which thatching is done, and the frequency of maintenance of the roof. The main agents of grass decomposition is mainly termites, vermin and damp weather. It is a highly inflammable material. As a roofing material, grass shortage is currently being experienced; and where it is available, it is bought at exorbitant prices. Most of the people in rural Siaya, still use grass as a roofing material because it is cheap

in the short run than corrugated iron sheets.

(3) Sisal poles are available. They are mostly used as roof rafters. When they are properly covered from moisture, their life span extends between 10 and 20 years. Because there is very little timber in the area, there are hardly any wood houses to see. Apart from roof construction sisal poles are sometimes used instead of timber in the wall.

(4) As for walling materials, bush poles, and soil or mud together with cowdung and ash form the bulk of the locally available building materials. Natural stones are also found in small areas within the district. Bricks are used in the areas where there is suitable clay for making them, for example, Yala division (See Plate 2 where natural stone is used for walling).

The houses and use of building materials are very uniform in all the divisions of the district. There are mainly living houses of the traditional type, a timber frame covered with mud to make the walls. The traditional method of wall building was of wattle and poles infilled with earth mud with a film of cowdung plaster on the inner surface of the wall only. The external wall was just left exposed to weather and termites · In one type of house, the wide eaves are not enclosed and the veranda so formed is open to the outside. The posts for the veranda are not as closely positioned as in the houses where the area under the eaves is walled up to create along, narrow, circular room skirting the central part of the house. The frame of the house is built of wooden poles of various sizes, while the strong papyrus stems are used as rafters. The vertical poles are connected with twigs and filled up with mud. Then,

these walls are plastered with clay or with a mixture of clay and cowdung. The roof construction is strengthened by reeds secured to the rafters by horizontal poles and then thatching is done. However, with gradual development, the mud (mixture of soil, ash, cowdung and water) walling came with increased thickness and improved life span.

In the normal traditional practice, cowdung and ash are added to mud to improve on the strength, workability and quality of the wall in general. Cowdung is also added to mud because of its protective characteristics to termites and other crawling insects. The ash which is regarded as traditional cement is still being used in rural areas as a stabiliser to soils with clay contents. In areas where murram and sand are available for wall building purposes, ash and cowdung are not added. The two products, cowdung and ash, are readily available in every home in the district as a by-product from cattle and cooking with firewood respectively.

As for the foundations of houses, holes are dug for each structural pole to an average depth of 30cm. After placing the pole into the hole the soil around is filled in and stamped with sticks until the pole is firm and upright (See plate I). For the floors, the top soil is removed and a bit of murram is added. After stamping with sticks until it becomes hard, cowdung or ash and cowdung finish is applied.

In Siaya District, there is no significant difference in method of construction except in places where papyrus reed thatching around Lake Victoria and swampy areas is practised, and in those areas where people have managed to use other

building materials such as concrete blocks, volcanic stone blocks and bricks for walling, and corrugated iron sheets for roofing.

The men are the builders. They build the walls and roofs of the building. Building materials such as grass for thatching could be cut well in advance and left to dry and transported to site before the day of construction. Structural timber and sisal poles, sisal ropes, and papyrus reeds to be used as purlins are all made ready on site by the time construction starts. Fetching cowdung, water, ash and placing the mud onto the wall structure is sole responsibility of the women. Besides digging foundations, building wall and roof structures, thatching is also men's work. They can as well help women with mixing the mud by jumping continuously on the mix until it becomes reasonably workable.

The traditional houses were generally small in size, 4-7 metres in diameter, mainly because houses were regarded as sleeping places. Sometimes they were used for consultations with elders, or used during bad weather. Otherwise the rest of domestic activities used to take place outside. Hence there was no serious need for bigger houses in the traditional Luo community. Apart from the limited activities expected to take place within the houses, roof spans were rather short due to the limited structural properties of the materials used for roofing. However, the traditional round houses were easy to 'design! using peg and string method. They were also structurally cheap to construct, and gave maximum space utilization.

Currently, the cost of building a house using traditional
building materials averages about Kshs. 1,500 per hut having
an area of about 4m by 3m; or one big room. The cost can
be even higher depending on whether timber and grass are
purchased. Each hut has an average life span of ten years
after several roof and wall repairs. The cost of repair can
be estimated at about Kshs. 450 each time, particularly, when
there is scarcity of seasonal construction materials like grass
for thatching.

Houses and their utility services

The availability of public amenities and services in
relation to housing provision and conditions causes happiness
to the residents of a region. There are services which are
directly related to housing conditions in a given environment
such as water supply and electricity, which may take the form of
connections to individual houses or, in the case of water, also collective
taps; and the provision of sanitary facilities, for example, pit latrines
in rural areas.

The Kenya Government has realised that water supply in rural
areas by individual connections. to homesteads is still beyond the
capacity of its resources. Because of the distribution of the water
resources in Siaya District, people staying around the water masses
such as Lake Victoria and river Yala use them as their main water
sources whereas the rest of the people depend on ponds, boreholes
and wells as their main sources of water particularly during wet
seasons. There are others who have access to communal taps
which are run by the various rural water supplies. In areas
where there are no communal taps, people are forced to trek long
distances in search of water from the lake or rivers together with their

livestock during dry seasons. This is particularly true in
the dry areas as one moves away from the lakeshore. The
energy requirements of most people in Siaya District are chiefly
met by firewood and charcoal (which are used for cooking and
heating) and by paraffin for lighting houses.

Decent housing is of great value to the development
in all the fields of human activity. A general view into the
existing conditions in other sectors becomes necessary because
investment in housing, even if only talking about investment
of manpower, is depending on the level of development in all
the same fields of activity when concentrating on housing problems.
Primarily, traditional type of settlements and conditions on
vital public rural facilities are of great interest besides some
major features concerning people habiting rural communities.
The prevailing economy in rural areas is of fundamental nature
in the question of housing besides some main living aspects.

Other Infrastructure

Accessibility of housing to community facilities such
as health services, schools, shopping areas and places for
worship, and transportation facilities is important not only
to urban dwellers but also to people in rural areas. These
are services which are only indirectly related to housing conditions
but which, if available at a convenient distance increase the
satisfaction of living in a certain area. It is therefore of prime
importance to consider public transport, health and educational
facilities, and their distribution within the district.

Road Transport is currently the most important means of transportation in Kenya. The present road network in Kenya has been classified into a five-level hierarchy, ranging from International Trunk Roads (A) to Minor Roads (E). Generally the higher categories of roads A, B and C constitute the arterial system of Kenya. The D and E roads form the access routes which chiefly have a regional and local function. For the purposes of easy transportation there has been intensification of the road network in Siaya District by constructing new access roads and to increase the performance of the existing roads by upgrading them into higher classes and maintaining them to a level whereby the roads are usable for the greater part of the year. Road distribution in the district in 1983 was 141.8 km Classified Bitumen Roads, 1035.6 km Classified Gravel/Earth Roads, 221.5 km Unclassified Rural Access Roads, and 373.1 km Unclassified School Access Roads[15]. From the figures, it is realised that only a minor part of the road network can be classified as all weather roads. This implies that there is substantial transport difficulties in the district during the rainy season. As a result, many rural households are served only by minor dry weather roads.

Bus services connect the main urban and rural centres of the district. In addition, "Matatu", and the privately owned mini buses also take care of the transport needs between the major urban centres, market centres, and most local centres along the rural routes. Because many villages are situated far from the roads, and because of the dispersed pattern of settlements, people do not fully benefit from bus routes and

have to walk considerable distances to catch road transport.
A substantial part of transportation is still largely on foot or
bicycle except when long journeys (like between major market
centres) are involved. Transport however should be seen as
a service to the people, which follows the development in other
sectors of the economy because it opens up areas for trade
and facilitates communication. Improved public transport
whether in rural or urban areas helps in creating better living
conditions in the human environment. When decent housing
is surrounded by improved transport facilities, the physical
environment created causes increased happiness to the inhabitants.

Educational facilities can be considered in terms of
schools and the total student population in the district. In
1983 there were a total enrolment of 160,794 pupils in the 526
primary schools in the district[16]. This showed an increase
of 212 schools and 62,358 pupils over the 1979-1983 development
plan figure. The number of teachers increased from 3,054
to 4,110, while the number of education zones rose from 8 to
17. Bondo Division because of its size and population had 7
education zones and 1,330 teachers in the 206 schools. The
distribution of schools in the district is not regular. Schools
are always set for a particular given population to support its
establishment, and the population is not evenly distributed.
Primary schools' pupil enrolment in the district in 1983 was
3.72% of the national figure.

In the same year 1983, there were 52 secondary schools
out of which 23 were fully government maintained and 14 were
government assisted Harambee schools. The rest 15 were either
unaided harambees or private schools. The total secondary
school enrolment was 11,336 with a total number of 454 teachers
in the district. Judging from the number of schools, this
enrolment is far too low and depicts the serious underutilization
of the existing facilities. The average student enrolment per
school throughout the district was 218. Out of the 52
secondary schools, there were 9 A-level schools.

Parents frequently give education the highest priority
as an aspiration for their children. Therefore if a decent
house is provided in the rural area, it will be of great help
to the pupils in undertaking their studies. Good housing
provides the occupants with proper environment necessary
for sound sleep. The availability of educational facilities at
convenient distances when combined with good housing improves
the performance of the pupils apart from improving the living
conditions in such areas.

The Health System in Siaya District comprises hospital,
health centres, dispensaries, sub-health centres and rural
health units owned both by government and various Missions.
There are four hospitals, that is, government owned Siaya
District Hospital and three Mission owned. By 1980,
there were six health centres, twenty three dispensaries and
one sub-health centre. These are still far from being adequate,
although the lower rank facilities are fairly distributed over
the district. Siaya District Hospital is the only big hospital

and is not capable of handling numerous medical cases in the district. The high demand for health services has therefore not been adequately satisfied. The major development targets set under the health sector in the district's development plan for 1984-1988 is the opening of new health facilities, revival of dormant facilities established by the community, upgrading of existing facilities, and expansion of existing facilities to accommodate more activities. In order to improve the public and environmental health services, there has been an intention to increase training schedules for field health educators and health visitors and to establish more service delivery points throughout the district.

Decent housing cannot be complete when health facilities are not available at convenient distances. This is because access to medical help for the treatment of injuries or sickness is of basic importance to well-being. The provision of community facilities and public services are therefore important in the provision of housing. The issue is critical in urban areas where their provision contributes to the decision regarding where one prefers to stay, in particular, accessibility of housing to one's place of employment. Although in rural areas, their provision is not directly related to the housing conditions, when they are within the proximity of the house, they tend to raise the living conditions in such areas.

FOOTNOTES

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CHAPTER 5

EVALUATION AND ANALYSIS OF HOUSING
CONDiTIONS IN THE STUDY AREA

The last two chapters have detailed discussions on the role of housing development in the overall national development, national housing policy and policy formulation, role of government agencies such as National housing Corporation (NHC) and Housing Finance Company of Kenya Limited (HFCK) in housing development, and the general characteristics of the study area (Siaya District). From the analysis and discussions, it was noted that the government agencies commit large amounts of funds in housing development in urban areas than rural areas in an attempt to solve the acute housing shortage facing the urban dwellers. This trend does not positively contribute to Kenya's long term objective of providing every family with a healthy living environment in the form of a decent house as stipulated in the national development plans. However, it must be appreciated that the two agencies discussed earlier besides local authorities are the agents of the government through which the bulk of public funds are spent for provision of housing. It is therefore wrong and unjustified to under-estimate the role being played by the two bodies in trying to help the government fulfil its development objectives as regards housing provision.

This Chapter therefore provides an empirical evidence and verification of the housing conditions as they exist following the findings from the field survey. The data analysed from the field survey carried out in the three sub-areas of the study area regarding the various aspects of housing conditions in the rural areas of Siaya District are presented in the form of discussions, tables and equations.

The settlement pattern in Siaya District was originally in dispersed homesteads of varying sizes which contained separate dwelling units for the various members of the extended families as pointed out in Chapter 4. The location of the houses on the homestead followed a strict pattern, with only a slight variation from place to place. The main house where the head of the household lived, was built in the centre of the homestead with wives houses alternating to the right and left of the gate. Nowadays, the homestead gradually become smaller in size because of the increasing population density, the growing sub-division of land and the general reduction of the proportion of polygamous households. The polygamous households have separate houses for each wife and their children. The number of houses in a homestead still varies with the size and type of the household. In addition, the homestead commonly comprises granaries, a stable, a pit latrine and sometimes a bathing place.

Homesteads in Siaya District differ strongly in size. This is shown by the substantial differences in composition as to the number and type of residential and other structures. With respect to residential structures, the following types may be distinguished: the main house as the quarter for the man and his (first) wife in case of a male head of household, and for the second and third wive's houses in case of a polygamous household; the boys' house for the unmarried sons and the 'other relatives' houses for married sons still living on the parents homestead. The number of houses in a homestead measures homestead population, homestead size and number of dwelling units in the housing stock. From the survey, 71.8% of homesteads have between 1 and 4 houses, 23% between 5 and 8 houses, 4.4% between 9 and 12 houses, and 0.8% with over 12 houses. The sub-areas of Siaya District show little variation apart from Central Sakwa Location where 1.7% of homesteads have over 12 houses. The average number of houses on the homestead is approximately 4 (See Plate II).

Table 5 - 1 Number of buildings/houses in the homestead, Siaya District sub-areas (% of homesteads Surveyed).

Variables (No. houses)	Uholo	C. Sakwa	N. Alego	Total
Between 1-4	82.4	64.4	68.7	71.8
" 5-8	16.5	27.2	25.3	23.0
" 9-12	1.1	6.7	5.3	4.4
Over 12	0.0	1.7	0.7	0.8
Total	100	100	100	100
Average	3.65	3.51	3.93	3.65

Source: Field Survey 1985

In addition to the residential quarters, the
homesteads generally have a latrine although there are
homesteads without pit latrines. Apart from pit latrines, 0.6%
of houses covered during the survey have water borne sanitation.
These are modern permanent houses constructed in areas where
there are rural water supply. However, the higher proportion
of homesteads without latrines in Central Sakwa area 33.3% is
related to the bushy environment prevalent in the location
whereas lack of water borne sanitation is as a result of
non-availability of piped water in the houses.

Table 5 - 2   Type of toilet as % of number of homesteads
in the sub-areas of Siaya District.

Variables	Uholo	C. Sakwa	N. Alego	Total
Pit latrine	95.9	66.7	97.3	85.8
Water borne sanitation	1.8	0.0	0.7	0.6
No. latrine	2.3	33.3	2.0	13.6
Total	100	100	100	100

Source: Field Survey 1985.

There are public amenities and services such as water
supply which directly relate to housing conditions. Water
supply may take the form of connections to individual houses
or collective taps. Since in rural areas water supply by
connections to individual homesteads or houses is making
extremely high demands on the Kenya governments'
financial capacity, the future water supply plan. is based

on a system of communal water points. The basic rural service standard is defined as a one communal water point to serve the domestic and livestock needs of a population within a radius of 2 kilometres in high potential and 5 kilometres in medium potential areas. Since the vast majority of the land in Siaya District is classified as high and medium potential and since the low potential areas in Bondo Division still have a high population density, an overall distance of 5 kilometres could be applied as the standard for the district. The present situation is a far cry of the standards to be achieved in the near future. In fact, water supplies in the form of piped water only reaches some 8.5% of those interviewed. It is clear, however, that the majority of the rural population in Siaya District obtains water needed from the numerous communal ponds, and streams and rivers in the high and medium potential areas. No detailed information is available about the quality of the water, but it is known to deteriorate during the dry season. During the dry season, about 12.9% of the rural population trek long distances to fetch water from Lake Victoria, particularly people from the dry and harsh conditions in Bondo Division.

Table 5 - 3

The main source of water supply in the sub-areas of Siaya District, as % of those interviewed, during wet season.

Variables	Uholo	C. Sakwa	N. Alego	Total
Stream/river	14.0	5.1	51.0	19.8
Communal pond	52.8	53.2	18.1	44.3
Communal tap	3.8	4.2	9.0	5.3
Bore hole	20.4	1.3	3.2	8.9
Roof catchment	7.7	19.8	8.4	12.4
Piped water in compound or house	1.3	0.4	10.3	3.2
Lake	0.0	16.0	0.0	6.1
Total	100	100	100	100

Source: Field Survey 1985

Table 5 - 4

The main source of water supply in the sub-areas of Siaya District, as % of those interviewed, during dry season.

Variables	Uholo	C.Sakwa	N. Alego	Total
Stream/river	14.9	3.0	58.0	21.9
Communal pond	55.9	52.8	18.0	45.0
Communal tap	3.9	5.0	9.3	5.7
Bore hole	24.0	1.0	4.0	11.0
Roof catchment	0.0	0.0	0.0	0.0
Piped water in compound/ house	1.3	0.5	10.7	3.5
Lake	0.0	37.7	0.0	12.9
Total	100	100	100	100

Source: Field Survey 1985

Characteristics of Households

This section present the details regarding the characteristics of households and their activities, such as sex, age, occupation, household size, total land owned including the homestead and land under crops in hectares, income levels, and activities that some members of the household are engaged in.

From the analysis, 90.4% of households are headed by males. Female household heads are widows. The average age of the household head in Siaya District is 49 years. There is however great variation between the youngest household head of 20 years and the oldest household head of 95 years among those interviewed. The proportion of household heads between 40 and 59 years of age is 43.8%, between 20 and 39 years 30.4% and 60 years and above 25.8%.

As pointed out in Chapter 4, household head's main occupations included farming, teaching, public and private sector employees, business and fishing. Apart from the main occupations, household heads engage themselves in other activities to make ends meet. From the survey, it is realised that 53.4% of the household heads participate in cattle rearing, 31.7% in farming, 3.4% in fishing and other self-employment works, 1.5% in shop and hotel business, and 10% depend only on their main occupations. The other members of the households also engage in other activities, farming 67.6% and other employment (teaching, business, public and private sector employees) 28%.

The average household size is quite high with 7 persons per household, and only varies slightly between the three sub-areas of the district. The household size does not pose any problem on the occupancy rate as households construct other dwellings for members as need arises. There is a higher proportion of bigger households in polygamous families just as there are many houses belonging to them. Of the total number of household heads interviewed, 54.6% households have between 2 and 6 members, 35.8% have between 7 and 11, 5% between 12 and 16 and 4.6% have 17 and above members.

The variation in population density in the district is reflected in the differences in average farm size between the selected three sub-areas. In general, the average farm size is 2.8 hectares although in Central Sakwa location, the average farm size is 3.6 hectares. However, farms are substantially smaller in Uholo location which falls under the high potential area of the district. The total district average is hardly a meaningul figure under the circumstances observed in the district where 43.8% of households have between 2.0 and 4.0 hectares, and yet 57% of households have only between 0.8 and 1.6 hectares of land under crops. The proportion of households with land title deeds is only 46.4%.

Tab.e 5 - 5

Frequency distribution of farm size in hectares in
the sub-areas, Siaya District as % of those interviewed

Variables (Land in ha.)	Uholo	C. Sakwa	N. Alego	Total
Under 2.0	51.8	23.9	45.3	39.8
Between 2.0 and 4.0	38.8	54.4	36.7	43.8
Between 4.1 and 6.5	7.0	12.2	15.3	11.4
Between 6.6 and 8.9	0.6	5.6	1.4	2.6
Over 8.9	1.8	3.9	1.3	2.4
Total	100	100	100	100
Average	2.3	3.6	2.5	2.8

Source: Field Survey 1985

The farm size is reflected in the cropping pattern. A
large proportion of the households use land under cultivation
for the food demands of the household. A higher proportion of
74.6% of households engage in subsistence farming only whereas
the remaining 25.4% grow subsistence and cash crops. This in
addition to the small hectares under crops may contribute
towards the low incomes prevailing in the district. Almost in all
the three sampled sub-areas of the district, the average land
under crops is approximately half of the hectares owned by the
households. The crops grown for subsistence include maize,
millet, cassava, sweet potatoes, beans and finger millet, whereas

the   dominant   .. cash crops are grour Jnuts and cotton

(in the low potential areas); coffee and sugar cane in the

medium and high potential areas.   The district data indicated

the importance of livestock, which functions as a source of food

and monetary income.   Both grazing land and cattle are

distributed irregularly over the households in all areas.

Table 5 - 6

Frequency distribution of land under crops in hectares
in the sub-areas, Siaya District as % of those interviewed.

Variables (hectares under crops)	Uholo	C. Sakwa	N. Alego	Total
Under 0.8	31.8	13.3	14.0	19.8
Between 0.8 and 1.6	54.0	60.0	56.7	57.0
Between 1.7 and 2.8	5.9	14.5	18.7	12.8
Over 2.8	2.4	12.2	5.3	6.8
None	5.9	0.0	5.3	3.6
Total	100	100	100	100
Average	1.0	1.7	1.2	1.3

Source: Field Survey 1985

Cattle rearing is not important as a source of monetary

income.   However farm incomes form only part of the total

household income and for quite a number of the households

just a minor part.   For those engaging in farming as their

main occupation, quantifying their income became   very

difficult considering that a higher proportion only participate

in farming at subsistence level.   Their income is therefore a

reflection of their monthly purchases whether money is got from farm produce sales or remittances from absent members of the household.

Total household income levels show little variation between the three sub-areas of the district. However, the results show that 40.6% of households have a monthly income which is under Kshs. 400.00, 19.8% between Kshs.400 and 800, 11.6% between Kshs. 801 and 1200, 13.6% between Kshs.1201 and 1600 and 14.4% over Kshs 1600, of those interviewed. Whether this high proportion of low income affects the housing conditions in the district is considered later in the Chapter.

Table 5 - 7 Frequency distribution of total household income in the sub-areas, Siaya District (% of households) per month.

Variables (income Ksh. per month)	Uholo	C. Sakwa	N. Alego	Total
Under 400	44.7	32.8	45.4	40.6
Between 400 and 800	21.8	20.6	19.3	19.8
Between 801 and 1200	7.1	16.7	10.0	11.6
Between 1201 and 1600	12.9	15.6	11.3	13.6
Over 1600	13.5	14.3	14.0	14.4
Total	100	100	100	100

Source: Field Survey 1985

The discussion and analysis has concentrated on the settlement pattern in Siaya District, homestead sizes in terms of number of houses, available amenities and services such as sanitation facilities and water supply sources, and household's characteristics such as sex, age, main occupation, other activities, household size, farm size, land under crops and income levels. The following section deals with the results of a survey of the housing conditions in the rural areas of the study area and the determination of the methods of provision. This is part of the main objective of this study.

Housing Conditions in Siaya District

In carrying out a survey of the housing conditions as they exist in the rural areas of Siaya District, attempt has been made to see the variations in architectural style of houses with reasons given, building materials used, and number of rooms contained in the existing houses in the three sub-areas of the district. Further assessment of the housing conditions involved a subjective judgement of the state of some aspects of the house - for example, the floor, wall and roof conditions, and the general housing condition.

The original houses of the Luo are round shaped. However, the following general characteristics appear: houses are generally built with locally available building materials and are often of traditional type although there is a more intensive use of new building materials such as concrete blocks and, particularly, corrugated iron roofing sheets. Changes in housing conditions in the rural areas also comprise

a rather general deviation from round to rectangular form of houses and a slow expansion of amenities particularly, the rural water supply. The present size of houses are much bigger than the traditional ones which is a result of using poles with bigger diameters for the roof structure using nail joints and trusses.

From the survey, it is clear that there is variation in the architectural style or form of the houses assessed in the sub-areas of Siaya District. Of the total number of houses assessed, 82.6% are rectangular whereas 8.4% and 9.0% are round and square, respectively. This shows a complete move from the original round houses characteristic of the traditional practice. The reasons given for the architectural style included custom and tradition, nature of the building materials, and climate. However, 32% of the household heads interviewed had no reason for whatever form the houses took. The difficult thing to understand is why the people consider custom and tradition to be responsible for even rectangular and square shapes when it is known that traditional houses used to be round. In the sub-areas, interesting features are noted. For example, Uholo location had the highest number of household heads (73.5%) attributing the architectural style, whether round or rectangular, to custom and tradition. This however points to the fact that the people in the sub-area are strong believers of customs and tradition that they only see traditional practices as the main form determinant. It would therefore appear that traditional practices control their day

to day activities. In another sub-area of the district, North
Alego location, a high proportion of household heads interviewed,
69.7%, offered no explanation as to the contributory factor
to the architectural style of the house whether round,
rectangular or square. This phenomena cannot easily be
explained. The average reason for architectural style were
custom and tradition 32.2%, climate 1.5%, nature of building
materials 30%, and no reason 36.3%.

Table 5 - 8

Architectural style of the house and reason, in the
sub-areas of Siaya District, as a % of household heads
interviewed.

Variables	Uholo	C.Sakwa	N.Alego	Total
1. Round				
Custom and tradition	10.0	2.8	4.7	71.4
Climate	0.6	0.0	0.0	2.4
Nature of building materials	0.0	2.8	0.0	11.9
No reason	0.0	3.3	1.7	14.3
				100
2. Rectangular				
Custom and tradition	63.5	10.0	4.7	31.0
Climate	0.0	1.1	2.9	1.7
Nature of building materials	15.9	51.7	15.3	34.4
No reason	8.2	18.3	59.3	32.9
				100
3. Square				
Custom and tradition	0.0	0.0	0.7	24.4
Climate	0.0	0.0	0.0	0.0
Nature of building materials	0.0	1.7	2.0	35.6
No reason	1.2	8.3	8.7	40.0
				100
Total	100	100	100	100

Source: Field Survey 1985

Houses in rural areas of Siaya District show variation
in the use of building materials. They commonly have clay
and/or cow-dung plastered mud and wattle walls 73.4%, and
74% floors of earth and clay mixed with cow-dung. The main
difference between houses is found in the roofing material
where 62.8% are thatch and 37.2% corrugated iron sheets
and tiles. Only 0.2% of houses assessed had tiles as roofing
materials. In terms of building materials used, 10.6% of the
housing stock are permanent, 12.8% semi-permanent, 76.6%
temporary. This variation in the use of building materials
is also reflected in the sub-areas of the district with Uholo
location having the highest proportion 81.8% of temporary houses
as compared to 72.2% and 72.0% in Central Sakwa and North
Alego locations, respectively.   Whereas Central Sakwa
location have the highest proportion 22.8% semi-permanent
houses, the other two sub-areas lead in the percentage of
households with permanent houses. The case of Central
Sakwa can however be explained in terms of lack of natural
stone as a building material and the existence of poor soils.

Table 5 - 9

Variation in the Use of building materials in the sub-areas of
Siaya District, as a % of houses assessed.

Variables	Uholo	C.Sakwa	N.Alego	Total
Permanent houses	10.0	5.0	10.0	10.6
Semi-permanent houses	8.2	22.8	18.0	12.8
Temporary houses	81.8	72.2	72.0	76.6
Total	100	100	100	100

Source: Field Survey 1985

Originally, houses in rural areas were generally small in size being single living spaces because they were regarded mainly as sleeping places as the rest of activities used to take place outside. Apart from the building materials used in construction, the various types of houses differ strongly in size and in the number of rooms. In general, the main house is the biggest house although they also show variations in the number of rooms. The number of rooms contained in the existing houses show little variation in the sub-areas apart from Uholo location which have the highest proportion, 34.7%, of houses with one room. All the houses with one room ended up being temporary constructions.

Table 5 - 10

Variation in the number of rooms contained in the existing houses in the sub-areas of Siaya District as % of houses assessed.

Variables (No. of rooms)	Uholo	C. Sakwa	N. Alego	Total
One	34.7	11.1	19.3	21.6
Two	38.2	48.3	38.0	41.8
Three	11.8	23.9	24.0	19.8
Four and above	15.3	16.7	18.7	16.8
Total	100	100	100	100

Source: Field Survey 1985

The construction of houses in the rural areas of Siaya District appears to be commercialized to quite a degree. First, a strikingly high percentage of houses has been built with purchased local building materials: poles were bought for 63.5% of the houses. In Central Sakwa location which is in the low potential area of the district, the percentage was even higher for their houses, 77.8%. Thatching grass for 75.8% of the houses was bought. Here again, in Central Sakwa location, 82.5% of the households bought thatch.

Table 5 - II·

Sources of locally available building materials, poles and thatch, in the sub-areas of Siaya District as % of houses assessed.

Variables	Uholo	C.Sakwa	N.Alego	Total
Sources of Building Poles				
From own land	36.5	13.9	29.4	28.7
Got free nearby	4.1	8.3	15.3	8.8
Bought	59.4	77.8	55.3	62.5
Total	100	100	100	100
Sources of Thatch/grass				
From own land	18.8	10.0	15.5	14.7
Got free nearby	11.1	7.5	10.3	9.5
Bought	70.1	82.5	74.2	75.8
Total	100	100	100	100

Source: Field Survey 1985

Secondly, there is an intensive use in the construction process of paid craftsmen. Only 20.2% of the houses surveyed were built by owner with family and friends whereas 36.2% of the houses were built by fundi only. Houses built by fundi only were mostly permanent and semi-permanent structures where modern technology require special skills. The remaining 43.6% of houses were built by owner, family members and friends with fundi for either window or door fixing or roofing.

The costs of the houses are influenced by the type of building materials used, the degree of commercialisation, size of the houses in terms of rooms, and the age of the house in view of the sharp increases in prices of building materials over time. From the survey, about 31.8% of houses costing over Shs. 4,000 are either semi-permanent or permanent depending on the date of construction.

Lastly housing in Siaya District has been financed mainly from income derived from farm produce, self employment and paid job, that is, main occupation of the household head. Only 3.6% of houses were financed using borrowed money either from public or private sector.

Quality of Rural Housing

Determining the quality of rural housing by carrying out an assessment of the conditions of the existing houses and comparing them with a model of a rural house was another objective of the study. The quality of houses is only one of the determinants of the housing conditions of households.

The existing conditions of the various house components such as the floor, wall and roof also reflects the housing conditions as they exist considering the level of improvements and maintenance that have occurred since the date of house construction. This is however based on the interviewer's subjective comparison of general housing conditions for individual households and for the sub-areas of Siaya District. The type of houses commonly built in Siaya District, with mud and wattle walls a strong dominance of thatched roofs, and clay and cow-dung floor require a regular maintenance. In the absence of such maintenance and periodic repairs to the roofs and the surface of the walls, houses deteriorate quickly under the existing weather conditions, and the duration of the houses is shortened considerably. Unlike the thatched roofs which are improved and repaired when leaking, walls and floors require regular maintenance. From the survey, 28.8% of households indicated that they regularly plaster the floors and 14.1% plastered the walls regularly. The conditions of the houses where floors and walls are plastered regularly were in satisfactory state. The overall situation is such that 60.6% of the floors, 63.2% of walls, and 63.4% of roofs are in satisfactory conditions. And 39.4% of floors, 36.8% of walls, and 36.6% of roofs are in state of disrepair and therefore require proper improvement or total replacement. The general housing conditions is such that 53.6% are satisfactory (See Plates 4,9,10), 34.4% are bad and needs repair and improvement (See Plates 7 and 8), and 12% are very bad and needs total replacement with new structures (See Plates 5 & 6).

Living space per person; and availability of amenities such as kitchen, latrine, bathing facilities, drinking water form other important factors. Regarding drinking water, source and quality in combination with the distance to the main source of the water is an important criterion for assessing housing conditions in rural areas.

Housing conditions are used to determine the housing quality and are more favourable when measured solely in terms of construction materials. However, to determine housing quality, housing conditions as they affect households are gauged in a broader sense whereby account is taken of the living space in terms of acceptable number of rooms and available amenities. For the purposes of this study, housing quality is based on subjective quality judgements of the observed floor, wall and roof conditions. In order to allow for a subjective comparison of general housing conditions for individual households and for sub-areas of the district, and to trace factors related to differences in housing conditions, a score system is designed and different values attached to selected aspects of housing. Both the selection of these housing aspects and scores attached are highly arbitrary. Nevertheless, they are based on observed and recorded values attached to various aspects of housing, for example, floor, wall and roof. If, for example, housing conditions are only labelled "satisfactory" in case of cement-plaster walls, a good quality corrugated iron or tiled roof, a separate kitchen and bathroom, and piped water supply to individual homesteads, then all households would qualify as

having sub-standard housing conditions.

Using the score system designed by this researcher, various aspects of housing conditions were weighted. The relative weight of each aspect was determined by the importance attached to the aspect of housing on the part of the local population as realized during the field survey in discussions with the respondents. For the measurement of the quality of building materials of the house, only data for the main house was used because of the absence of clear criteria and yardsticks to be used that complicated the assessment of housing conditions of households. Details of the score system are given in appendix.

The score system containing some arbitrary and subjective elements, revealed sub-standard housing conditions for some 14.6% of the households, average for 23.6%, good for 36.8% and satisfactory housing conditions for 25%. There are striking differences between the various sub-areas with an average better situation in Uholo location and North Alego location. These locations are in high potential and medium potential areas, respectively. It is notable here that the distances to the sources of water in these two locations is relatively shorter than in the other locations. This makes it easier to improve on the housing conditions through regular maintenance. Central Sakwa location in the low potential area has the highest proportion of sub-standard housing conditions 27.8% largely because of lack of effective maintenance of the main housing aspects and services such as pit latrines.

Table 5 - 12

Housing quality in the sub-areas of Siaya District as
% of houses assessed.

Housing Quality	Uholo	C.Sakwa	N. Alego	Total
Satisfactory	19.4	19.4	38.0	25.0
Good	42.3	32.2	36.0	36.8
Average	29.4	20.6	20.7	23.6
Sub-standard (poor)	8.9	27.8	5.3	14.6
Total	100	100	100	100

Source: Field Survey 1985

From the survey, only 25% of the houses assessed are
satisfactory. This confirms the President's complaint that
rural housing in Siaya district is inadequate.

Evaluation of Housing Conditions Determinants

It was proposed in Chapter 1 of this study to use multiple
regression analysis to investigate the factors that may determine
the housing conditions in rural areas of Siaya District.

Selection of Independent Variables

There is considerable scope of choosing independent
variables to be included in a regression analysis concerned
with housing conditions. The variables may include those
which reflect the physical aspect of houses and those which
reflect the quality of construction. While it is easy to quantify
physical aspects like age of the house etc., it is extremely
difficult to quantify the quality of building materials in

mathematical terms. It is generally assumed that high quality
houses have to be built using modern building materials. It
is also extremely difficult to quantify variables which relate
to the intensity of use and the available amenities and services.
Age of the house measures the rate of wear and tear in a
building and is therefore thought of as a significant factor
in considering the housing quality. It is generally expected
that housing conditions reflect the income position of households .
The higher the income, better use of modern building materials
is expected.

Originally 14 possible independent variables were suggested for
investigation as of possible relevance in determining housing quality since a single
variable for the explanation of differences in housing could not be t raced.
Some of these factors were excluded such as land owned, land
under crops, occupation, other activities etc. for fear of
multicollinearity problem. Some variables are continuous
variables while others are dummy variables. These dummy
variables do not cause regression estimates to lose any of
their desirable properties. The main weakness of the
dummies is that the change is not continuous and therefore
a graph cannot be drawn to illustrate the gradient of change
from say mud and wattle walls to concrete block walls.

The data presented were analysed using "stepwise"
multiple linear regression analysis with the aid of statistical
package for social sciences SPSS - H - version 5.01 ICL 1900
computer. The significance of the use of stepwise multiple
linear regression analysis has been explained as an automatic
process that enables us to know how powerful an explanation the

regression model provides, i.e. how well the regression equation accounts for variations in the dependent variable. The preferred measure for this relationship in the case of multiple regression is the "coefficient of multiple determination", R^2. The R^2 for a multiple regression indicates the proportion of variation in Y "explained" by all the independent variables. Thus R^2 is given as:

$$\frac{\text{regression (explained) sum of squares}}{\text{total sum of squares}}$$

The possible values of the measure range from "+1" to "0". At one extreme when $R^2 = 1$, the independent variables completely account for variation in the dependent variable, so that knowledge of X values allows for the prediction of Y values without error. At the other extreme when $R^2 = 0$, the independent variables account for no variation in the dependent variable, so that knowledge of X values would be of no help in predicting Y values, for the variables are totally independent of each other. Generally, the closer R^2 is to 1, say 0.9, the more complete the phenomenon under study would be. However, this explanation amounts to no more than a mathematical necessity, rather than a causal explanation for the dependent variable. From the analysis $R^2 = 0.425$. Theoretically, the results show that the independent variables selected account for only about half of the variations in the housing conditions. This is merely a statistical "goodness of fit", and not a causal explanation for housing conditions.

Since, in general, housing conditions of households are fairly homogeneous in rural Siaya District, and housing improvement has a lower priority than e.g. education and improvement of the farm, one must therefore conclude that housing conditions of households differ according to the interest of the members of the household in attaining better housing conditions, the ecological conditions - both in terms of demand on housing as a means of protection from the inhabitants and in terms of the opportunities offered through the available local building materials,. the level of craftmanship with which the house was built, the magnitude of inside living space, the available amenities and services within the physical environment of the house, and the general state of maintenance of the house. These are the variables that could not be quantified which otherwise influence the housing conditions in rural areas.

It is therefore necessary to carry out tests of significance for each independent variable in the model so as to signify its association or otherwise with the dependent variable. The raw data which was fed into SPSS package are shown on appendix 5.

Tests of Significance

It was proposed in Chapter I of this study to test the validity of association between independent variable and the housing quality at 95% confidence interval. That is to say that based on the information from the field survey, we can be 95% confident, allowing for 5% error that the hypothesis formulated in respect to any independent variable with respect to the housing quality is true or false. For a given number

of variables, the null and alternate hypothesis for each

variable would be formulated in the form:

$$HO \quad \delta^2_{1.2\ 3\ 4\ \ldots\ldots\ldots n} = \delta^2_{2.1\ 3\ 4\ \ldots\ldots n} = \delta^2_{n.1\ 2\ 3\ 4\ldots}$$
$$n - 1$$

$$HA: \quad \delta^2_{1.2\ 3\ 4\ \ldots\ldots n} \# \delta^2_{2.1\ 3\ 4\ \ldots\ldots n} \# \delta^2_{n.1\ 2\ 3\ 4\ \ldots\ldots}$$
$$n - 1$$

where $\delta^2_{1.2\ 3\ 4\ \ldots\ldots n}$: etc. are expected variances of

X_1, X_2, ..., X_n; when the effects of all other variables

except that X_1 under consideration are held constant. Thus, the

null hypothesis HO, states that there is no relationship between

each of the independent variables X_1 to X_n, and the housing

quality. The alternative hypothesis HA states that there is

a causal effect between the independent and dependent variables.

To test the existence or otherwise of the relationships, the

statistic F was used. The statistic is given by:

$$R_{0.05 \cdot (r - 1, \, n - r)} = \frac{\dfrac{(R^2_{1.2\ 3\ 4\ \ldots\ldots\ldots n})}{r - 1}}{\dfrac{(1 - R^2_{1.2\ 3\ 4\ \ldots\ldots r})}{n - 1}}$$

The comparison of F values was made from values obtained

from the computer printout in the regression model (calculated F

values) and the F values tabulated in the Neave's Statistics Tables

at appropriate degrees of freedom. The null hypothesis was

rejected in each case where the F value calculated exceeded the F

value expected from the tables at the same degrees of freedom;

i.e. the alternative hypothesis that a relationship exists was

accepted at the 95% significance level, if the calculated F value was

found to be bigger than the expected F value. Whenever the

calculated F was found to be significantly bigger than the expected F, a significant causal relationship was therefore found to exist. From the results, it is realized that building materials greatly influence the housing conditions in the rural areas as thatch contributed about 0.306 of the variations in the quality of housing.

Table 5 - 13

Showing relationships between independent variables and the dependent variable

Variable	F Calculated	F Tabulated	Siginificance @ 95%
D4	219.93	3.84	Reject
Income (X_1)	143.75	3.00	Reject
X_5	103.65	2.60	Reject
X_4	83.54	2.37	Reject
D_3	71.01	2.37	Reject
D_1	60.21	2.10	Reject
X_6	51.96	2.01	Reject

Where D_4, D_3 and D_1 are dummy variables representing thatch, mud-wattle wall, and mud-wattle wall construction with cement plaster surface treatment, respectively. By rejecting the null hypothesis for the above independent variables, it is clear that there is relationship between the independent variables and the dependent variable. However, when the same variables are tested for significance using t statistic, income and X_5 become insignificant.

Y = Housing conditions in points

X_1 = Income level

X_2 = Wall type; D_3 = mud-wattle wall, D_1 = mud-wattle cement
$\qquad\qquad D_2$ = Blocks/Bricks/Stones

X_3 = Roof Type, D_4 = Thatch, D_5 Corrugated iron sheets

X_4 = Age of house in years

X_5 = Number of buildings in homestead

X_6 = Household size.

The Programme that was fed into the computer is shown in Appendix 7.

Using continuous variables X_1, X_4, X_5 and X_6 graphs can be drawn to illustrate the gradient of the change in housing conditions, dependent variable, Y. For instance,

$$Y = 9.82804 + 1.01412X_1 \qquad \text{(i)}$$

$$Y = 11.74792 - 0.07142X_4 \qquad \text{(ii)}$$

$$Y = 9.94590 + 0.34836X_5 \qquad \text{(iii)}$$

$$Y = 10.28383 + 0.13966X_6 \qquad \text{(iv)}$$

The model for measuring housing quality for Siaya District can therefore be given by the multiple regression equation as shown in appendix 6. The equation can be formulated as

$$Y = 13.22667 - 2.26179D_4 + 0.00144X_1 + 0.25943X_5$$
$$- 0.08874X_4 - 2.04867D_3 - 1.00027D_1 - 0.04034X_6$$

The quality of the constructions is dependent upon the type of building materials used, level of craftmanship, the age of the house and the intensity with which maintenance and repairs are carried out. The limited durability of the building materials in Siaya District is demonstrated by the age of the housing stock: average age is 6 years and more than half of all houses are less than 5 years old.

Assessment of Housing Requirements

It was pointed out in Chapter 2 that the current methods adopted in ascertaining housing requirements are not appropriate in all the cases. It is therefore necessary to distinguish between "housing demand" and "housing need" in housing assessment. In housing circles, "housing demand" is a parallel of effective demand in Economics. Demand for housing

relates to the accommodation which people are actively seeking
in a given time frame at a cost which they can afford. It
takes no account of any wishes of persons who do not
have income to acquire accommodation. The standard of
accommodation one would acquire therefore depends on costs
of construction at the material time and one's income. In
the rural areas of Siaya, the demand for houses is represented
by the existing houses because they are the ones which the
people have managed to construct. Whether the houses are
permanent, semi-permanent or temporary is immaterial as far
as demand of houses for each household is concerned.

With respect to the assessment of housing need, number
of houses needed by the additional population over a given
period of time should be stated, taking account of the
existing shortfall in the form of houses that do not conform
to minimum standards of health and privacy. In otherwords,
there should be an exercise carried out to ascertain the existing
housing stock and its quality. Furthermore, the assessment
of need should take into account the possibility of existing
housing becoming obsolete and hence requiring replacement.

Housing need is a measure of the number and quality
by which the existing accommodation falls short of that required
to provide every person in the population with some specific
standard of accommodation irrespective of one's financial
capability. A person's housing need is considered in terms
of comfort, health and privacy.

It was another primary objective of this study to investigate, establish and verify the level of housing requirements and need in Siaya District. Due to complexities involved in the assessment of housing need, the study therefore looked at two aspects of need. First, need is assessed in terms of materials of construction and size of the living space in terms of rooms which the households in the rural areas of the district consider to be adequate and satisfactory, and therefore providing them with the necessary comfort, health and privacy without looking into the financial implications of constructing such houses. The method of assessment appears crude but it throws some light on what the rural population perceives to be adequatehousing given resources. It was found out from the survey that, the housing needs of the rural population of Siaya District are not met. The reasons given for this state of affairs varied but a higher proportion of those interviewed pointed out form of construction and paucity of rooms as the factors that make accommodation inadequate and unsatisfactory. From the survey, only 17.2% of those interviewed considered their houses as adequate and satisfactory. On the form of construction, only 7% of the household heads accepted temporary houses as being capable of providing them with adequate accommodation. The rest complained of the constant need for maintenance of temporary structures and non-durability of the locally available building materials. In the sub-areas of Siaya District, striking variations existed concerning housing need in terms

of rooms and materials of construction which households
considered adequate and satisfactory. Generally, there was
liking for houses with more than two rooms. A higher
percentage of respondents opted for four rooms and above.
According to the results of the survey, the number of
rooms considered adequate and satisfactory were: one room -
1%, two rooms - 11%, three rooms - 22% and four rooms and
above - 65.4% of the respondents. With respect to adequacy
in terms of materials of construction, 67% considered
permanent houses, 26% considered semi-permanent houses, and
7% temporary houses as adequate. The variations in terms
of rooms and materials of construction in the sub-areas of
Siaya District were not easy to explain. There appears
to be similar housing need in Central Sakwa and North Alego
locations in terms of rooms in a house considered adequate
and satisfactory where only 3.9% and 3.3% respectively of
those interviewed accepted two rooms in a house as adequate.
The highest proportion 72.8% and 80.0% in both Central
Sakwa and North Alego locations, respectively preferred
four rooms and above.

Table 5 - 14

Variation in housing need in terms of number of rooms
and materials of construction considered adequate and
satisfactory in the sub-areas of Siaya District as % of
those interviewed.

Variables	Uholo	C. Sakwa	N.Alego	Total
Number of rooms				
One	2.9	0.0	0.0	1.0
Two	25.3	3.9	3.3	11.0
Three	27.1	23.3	16.7	22.6
Four and above	44.7	72.8	80.0	65.4
	100	100	100	100
Materials of Construction				
Permanent	47.0	66.1	90.7	67.0
Semi-permanent	36.5	31.7	7.3	26.0
Temporary	16.5	2.2	2.0	7.0
	100	100	100	100

Source: Field Survey 1985

Secondly, need was assessed in terms of the physical
housing units required to eliminate the housing problem. Any
assessment of physical housing needs must include an analysis
of two broad categories namely; those needs existing at the
beginning of the planning period, that is, housing that requires
improvement or replacement, and the need for the construction
of new dwellings to reduce density levels; and those needs
expected to arise during the planning period as a result of
population growth and decay of the existing housing stock.
There are therefore two key data input sets required to assess

physical housing needs – population variables and housing stock variables.

Population is the prime element in a housing needs assessment because population growth and household formation accounts for most future housing needs. The rate of household formation, the quotient of average household size and population, is also important because it yields projected numbers of households in future years, and therefore, the number of additional dwelling units required.

In Chapter 2, a model for measuring housing need for Siaya District was proposed as

$$E_t = H - U + H_t + rU_t$$

Where H = the number of households as of the beginning of the period covered by the estimate.

U = the number of acceptable living quarters in the inventory as of the beginning of the period covered by the estimate.

H_t = the projected increase in the number of households during the period covered by the estimate.

r = percentage rate at which acceptable living quarters will need to be replaced during the period covered by the estimates.

This crude estimate reflects the total number of dwellings (or other acceptable living quarters) required to eliminate the existing housing shortage, plus the number required to house the increase in the number of households and to replace units lost due to obsolescence.

The base year, beginning of the period covered by the estimate, is 1985. According to population projections by the government for Siaya District, the 1985 population figure was expected to be 650,600 of which 639,460 are rural population. The number of households as of the beginning of the period covered by the estimate H, is the total rural population divided by the average household size. From the survey the average household size is 7 persons.

$$H = \frac{639,460}{7} = 91,351 \text{ households.}$$

The number of acceptable living quarters in the inventory as of the beginning of the period covered by the estimate (U) can be estimated. In Chapter I, an acceptable living quarter meeting and satisfying minimum conditions of shelter was proposed as a 3-roomed house of mud and wattle wall construction, sand-cement surface treatment, cement screed floor, corrugated iron sheets roofing and pit latrine. From the survey, 20% of houses assessed meet the minimum requirements of acceptable living quarter. Assuming that each household has got one dwelling house, housing inventory comprised of 91,351 units,

U = 20% of the housing inventory =

$$\frac{91,351 \times 20}{100} = 18,270$$

U = 18,270 acceptable living quarters.

Housing Deficit = Number of houses in the stock less acceptable living quarters

= 91,351 - 18,270

= 73,081 units.

The period covered by the estimate is 6 years. Assuming that constant levels of fertility and mortality are maintained, and the expected average annual population growth rate of 3.12% is also maintained, the population projected for 1990 is 767,118. Assuming also that the proportion of the urban population projected for 1988 of 2.06% is maintained, the rural population is therefore expected to be 751,315. No greater change is expected in the average size of households. Therefore number of households in rural areas of Siaya District

$$= \frac{751,315}{7}$$

$$= 107,330$$

H_t = The projected increase in the number of households during the period covered by the estimate.

$$= 107,330 - 91,351$$

$$= 15,979 \text{ households.}$$

The dwelling life span can be used to obtain the rate of physical decay of the acceptable dwelling units. This therefore estimates the percentage of units that need to be replaced annually because of physical deterioration. For example, if the life span of each unit is fifty years, then the annual replacement need can be seen as 2% of the existing stock. Considering the state of the houses from the field survey, the life span of acceptable living quarters is assumed to be 40 years, resulting in replacement rate r of 2.5%. In addition, the existing sub-standard stock of housing that cannot be improved also requires replacement if the entire housing stock

is to be raised to the minimum standard specified. From the
the survey, 12% of the housing stock is very bad and needs
immediate replacement. The units that require immediate
replacement

$$= \frac{91,351 \times 12}{100}$$

$$= 10,962 \text{ units}$$

Housing need $E_t = H - U + H_t + rU_t$

$$= 91,351 - 18,270 + 15,979 + \frac{2.5(18,270)}{100} 6 + 10,962 \text{ units}$$

requiring replacement.

$E_t = 102,758$ housing units.

Problems identified in Rural Housing Provision

In their attempt to provide themselves with decent
accommodation, the rural households of Siaya District are faced
with some problems. The problems, however, are not discussed
in details. These problems are revealed by the background
studies and analysis contained in the early sections of this
Chapter. In discussing the problems, they are grouped and
considered under five subject areas namely, the locally
available building materials, cost of such materials, people's
income, the available services such as water supply and
the attitude of the people towards housing.

The first problem identified in rural housing provision
in Siaya District is the shortage of the locally available building
materials particularly thatch for roofing and poles for wall
construction. Thatch, in particular, is scarce in the rural

areas such that some families plant for bu lding purposes.

However, thatch being a seasonal material, whose availability

depends on the rainfall pattern, has been in shortage following

the successive droughts making houses constructed during

that period very costly. Moreover, because of population

growth and pressure on the available land, the people are

finding it difficult to preserve pieces of land for the purposes

of grass planting. It is therefore eminent that the problem

of thatch shortage may continue to be experienced. However,

the relative importance of thatch as a roofing material cannot

be underestimated because from the survey analysis, it is

realised that 62.8% of the assessed houses are thatched. Other

building materials for roofs e.g. galvanised corrugated iron

sheets and tiles comprise only 37.2% of the surveyed buildings.

There was the general problem of leaking roofs. This cannot

be blamed wholly on the species of thatch because lack of

building skills could also be contributory factor. Building

poles are also in short supply particularly in the drier areas

of the District, Bondo Division, where people had relied

on trees from the forests. But with the clearing of forests

for agricultural purposes, building poles for wall construction

are becoming scarce as well.

The second problem identified arises from the shortage

of building materials. There is the problem of high cost of

the building materials. Because of the scarcity of the

building materials, the prices of thatch and poles are high

such that the overall cost of house construction is escalating.

This added to the high cost of labour, particularly the craftsmen with thatching skill, makes the total cost of a temporary house unbearable. The high cost of labour arises from lack of people who have the necessary knowhow in the traditional skills resulting from the bias towards employment in urban areas.

Another problem identified in the rural Siaya District is lack of employment opportunities. This has resulted in very low incomes for the majority of the people. Although the mean income for those covered in the survey is about Kshs. 700.00 per month, the majority of the population, 40.6%, get less than Kshs. 400.00 per month. This sometimes comes from the sale of farm produce or remittances from other relatives for the purposes of meeting the cost of other essentials. However, because income is an important element in determining the type of house, there is need to find ways of increasing the peoples income.

There was also the problem related to the provision of services such as water supply to the rural households. The main sources of water in the rural areas of Siaya District are streams and rivers, communal wells and ponds, bore holes and Lake Victoria. The problem with the water supply is related to its quality particularly during dry seasons and the distance from the sources. There is therefore greater need on the part of the government to provide rural households with clean and safe drinking water.

The last problem identified in rural Siaya is the people's attitude towards housing. The houses in the District are generally of average standard except for the few people who have managed to construct   permanent structures. There is lack of adequate knowledge on the improved technology regarding the use of cheap and locally available building materials. The people of the district regard construction using concrete blocks or natural stones as the only building materials that can be used in the construction of durable houses. And therefore those not in a position of purchasing the "modern" materials are regarded as not capable of providing themselves with decent housing.

This problem can best be solved by first carrying out a study of the soil types and other building materials thus coming up with solutions as to how improvements can be made on the housing conditions.

Plate 1: Wall construction using traditional methods and skills.

Plate 2: Wall construction using locally available natural stone.

Plate 3: Reeds replacing grass as roofing material. The re-roofing is still half-way through.

Plate 4: A house properly thatched and maintained. Although it is constructed using locally available building materials, it is of good quality.

Plate 5 and 6:   Example of houses that require
                 immediate replacement.

Plate 7: A house whose wall requires improvement in order to provide adequate shelter.

Plate 8: This house shows a combination of "modern" building materials (corrugated iron sheets) and traditional materials (Clay and cow-dung) for walling.

Plate 9: Semi-permanent house (a model of adequate house in rural area).

Plate 10: An example of adequate house constructed using concrete blocks in some rural areas of Siaya District.

Plate II: An example of a Luo homestead. Originally, there used to be a fence round the homestead surrounding the houses and the animals.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

In the previous Chapter, characteristics of the various
households and their actual housing conditions are analysed
and presented. This Chapter considers the satisfaction of
households with their housing conditions, their preferences
for improvement of housing conditions in comparison with other
types of expenditure and recommendations based on the findings
from the field survey. The level of satisfaction and preferences
form important indicators for policy makers as they show whether
any attention has to be paid to the improvement of rural housing
in comparison with other urgent necessities under the conditions
of scarce resources and indicate the nature of measures to
be taken.

As to satisfaction with present housing conditions,
attention was paid to the size of the homestead, size of the house
in terms of rooms, type of building materials, and the
availability and quality of water. Heads of households were
asked whether they were satisfied with the quality of
building materials and about the distance to the source of
water supply. The higher degree of satisfaction in size
of the homestead can be explained in terms of land availability
which allows for expansion as demand for more houses is realised. Most
of the household heads expressed their great dissatisfaction to the size of houses
complaining of the few number of rooms in the existing
houses. As regards the quality of the building materials, only
those whose houses are permanent or semi-permanent indicated

that they were satisfied. Further analysis show a generally

better housing situation for those households satisfied with

the quality of building materials. Those households not

satisfied pointed to non-durability and regular maintenance

required by the houses. In general, however better housing

conditions tend to correspond with a higher degree of

satisfaction. As for water availability and its quality,

there appears to be a higher degree of dissatisfaction

with distance from the supply source as well as the quality.

The improvement of rural housing should be the

first concern of the occupants. But this rarely happens in

the case of the poor. However bad the conditions of rural

housing may be, the poor everywhere are not found to give

high priority to housing, mainly because they have so

many other urgent priorities to take care of, such as food,

clothing, employment, health, religious observations and

traditional customs, all of which cost the poor large sums

of money which go far beyond their earning capacities. This

situation is true for Siaya District's rural households where

a higher percentage of the households give housing improvement

third priority after business, education and improved farming.

One may assume that a high degree of dissatisfaction

with housing conditions leads to a high priority for

improvement of housing if extra means of income become

available. The actual response for Central Sakwa location where

27.8% of households are occupying sub-standard housing agrees

with this assumption. Households in this sub-area of Siaya

District put a high priority to housing improvement, followed

by investment in business activities, improvements of the
farm, and educating children. The low priority accorded to
farming in Central Sakwa location is because of the
climatic conditions existing. The location lies within the low
potential region of the district where the rainfall pattern and
amount is not sufficient for large scale agriculture despite
the availability of large tracks of land.

In the other sub-areas, Uholo and North Alego locations,
households give priority to investments in business activities followed
by the improvement of housing and improved farming, and investments
in agriculture followed by the improvement of housing respectively. The two
locations fall within the high potential areas and medium
potential areas respectively and therefore regard agriculture
as income generating activity hence need to invest extra
income in improved farming. The education of children is
also seen as an investment. It is interesting to note that
those households who put improvement of housing as first
priority are either households having young children who
are still in primary schools or households with most of
the children having completed secondary education.

Priorities	Uholo	C. Sakwa	N. Alego	Total
First Priority				
Improve housing	20.5	32.0	24.5	25.6
Educate Children	14.0	14.0	21.8	16.4
Start business	45.0	30.4	17.7	31.7
Improve farming	20.5	22.5	36.0	25.9
Buy furniture	0.0	1.1	0.0	0.4
	100.0	100.0	100.0	100.0
Second Priority				
Improve housing	16.7	15.6	30.3	20.4
Educate Children	24.4	33.0	32.9	30.1
Start business	25.0	24.6	12.5	21.0
Improve farming	33.3	23.5	22.4	26.5
Buy furniture	0.6	3.3	1.9	2.0
	100.0	100.0	100.0	100.0
Third Priority				
Improve housing	29.2	41.0	35.8	35.6
Educate children	26.9	16.9	25.2	22.7
Start business	14.0	19.1	16.6	16.6
Improve farming	27.5	19.7	17.9	21.7
Buy furniture	2.4	3.3	4.5	3.4
	100.0	100.0	100.0	100.0

Source: Field Survey 1985

Table 6 - 1

Priorities for spending loan or extra income, sub-areas
Siaya District as % of households.

The type of improvements desired also agrees with
the expressed dissatisfaction, that is, better building materials,
notably corrugated iron sheets as roofing material, and more
living space. However, they show less relationship with actual
housing conditions as the type of improvements desired show
little variation in all the three sub-areas of the district. The
preference for more living space in Uholo and North Alego
locations coincide with the high proportion of existing houses
having single rooms, 34.7% and 19.3% of households respectively.
The high proportion of households prefering wall
improvements, 26.1%, in Central Sakwa is not surprising as
most people have temporary houses with corrugated iron
sheets as the roofing material. This can be explained by
the shortage of grass which has made the price to be too
high hence use of corrugated iron sheets.

Table 6 - 2

Preferred types of improvements in housing conditions,
sub-areas of Siaya District as % of households.

Priorities	Uholo	C. Sakwa	N. Alego	Total
Better roofing material (gci)	41.2	38.3	44.7	41.2
More living space, bigger house	35.3	29.4	30.7	31.8
Improve the walls	17.1	26.1	14.0	19.4
Improve the floors	3.5	3.4	2.6	3.2
Improve the toilet	2.9	2.8	8.0	4.4
Total	100.0	100.0	100.0	100.0

Source: Field Survey 1985.

From the analysis it is realised that households agree
that there is need for housing improvement varying from use
of better roofing material, making more living space, to wall
improvement depending on the housing condition.   However,
it should be noted that house building in rural areas is still
dominated by traditional materials and construction methods,
but other materials and different applications of traditional
ones are being introduced.   Leading in this field are
corrugated iron sheets.   These are firmly established with
the people and the only prohibitive factor in the more general
use of this material for roofing in rural areas is lack of
finance.   Probably as a result of the wider use of corrugated
iron sheets is a more frequent use of sawn timber for roofing.

However, improvement of housing in rural areas cannot
be achieved without obstacles.   There exist many restrictions
such as availability of durable materials for building purposes
at reasonable costs and scarcity of manpower resources for
housing construction.   For there to be improvements, changes
must take place in housing towards the betterment of the
existing housing conditions.   The new conditions must meet
the minimum housing requirements accepted as providing
adequate accommodation.

Rural housing policy

Kenya government policy pays little attention to rural
housing.   The plans show a distinct bias towards the urban
areas.   The specific paragraphs of the plans devoted to rural
housing makes it clear that government assistance will be

minimal. The increased attention of rural housing would have to materialize through more development funds; more loans to individuals for permanent houses; provision of building plans adapted to local needs; research into local building materials; and strengthening of relevant institutions. In line with national priorities, the Siaya District Development Plan hardly pays any attention to the improvement of rural housing conditions. This points to the neglect of housing problems in the rural areas.

In the housing field a prerequisite to policy formulation is an assessment of the quantitative and qualitative aspects of existing housing and related facilities and services and some estimate of present and future housing needs. Reliable estimates of housing needs are an important factor in establishing housing policy and for the formulation and evaluation of housing programmes. They indicate the magnitude of the housing problem while changes in the level observed at regular intervals provide an index of the extent to which programmes and policies are meeting the housing needs of the population affected. In policy formulation, housing standards, which are measures of the acceptability of housing at a given time and place and in a given cultural, technological and economic setting, are very important. The aspects of housing acceptability include amount of space, type of construction, services and facilities. Housing standards, must, therefore, be viewed in totality as a set of closely interrelated criteria intended to achieve the best possible balance between the needs

and resources of population groups at various stages of development. Objectives to be achieved by housing standards should include privacy, comfort, amenity, convenience and satisfaction in family and community living. There is always discrepancy between housing standards and family requirements. This concerns lack of variety and lack of flexibility in the type of housing solutions they inspire. Housing is usually provided in standard sizes, plans and materials with little or no consideration given to different needs arising from differences in family type and size. Little is known about such things as how need for space varies with the stage of family life-cycle or how the need for privacy changes with composition of the family e.g. stage in life-cycle, size, composition, life style, education etc. Cultural factors make for a further problem in the formulation of standards.

While the Kenya government stresses the importance of decent dwelling, insisting on such constructions to be of permanent materials for one to qualify for the Rural Housing Loans is demanding too much for rural areas. The mentality that stone houses are the best should be got rid of. If stone or concrete block houses are the only ones regarded as providing decent dwelling, the maximum loan of Shs.80,000 given by the National Housing Corporation is so little that it cannot complete the construction of a decent house considering the current costs of building materials. The policy should therefore specify that suitable material for every area be used in building decent houses. Otherwise

the prime objective of providing every Kenyan with a decent
house cannot easily be realised.

It is true, for example, that apart from its participation, through
the National Housing Corporation, in the tenant purchase and rental schemes in
some of the larger urban centres, the interest or impact of Ministry of Works,
Housing and Physical Planning in rural housing is negligible,
if any. The Ministry is, in other words, not an important
factor in the housing of the majority of the people. They
are supposed to provide a roof over their heads without much
fuss and with the resources available to them. Even where
individuals who are better off decide to improve their homes
by putting up permanent buildings, the central authority hardly
comes in. It is often a "do it yourself" exercise with half-
baked architects displaying their skills to the full.

The government therefore need to adapt two policies
on housing, namely:

(1) There should be development and articulation of
a national policy which must be effective, strong and workable
to form a starting point for a rational attack on the overall
housing needs. The policy objectives should be clear,
emphasizing on:

   i) family needs and improved designs

   ii) improved constructions

   iii) proper use of local materials

   iv) more desirable rural settlements.

Social goals should be incorporated in housing policies.
In development plan social goals in housing policies should

aim at making available "adequate" or "standard" housing for the entire population. The first significance of housing is related to the need for sanitary shelter. Since the dwelling is the major setting for family life, it should offer adequate space for eating, meeting, sleeping etc. Social goals in housing policies should be progressive rather than definitive and room for improvement should be provided. Necessary basic goals require the government to:

i) Effect the redistribution of housing resources;

ii) Use housing as a tool to redistribute income;

iii) Give higher priority to providing housing for the lower-income and weaker sections of the population, with minimum space and basic community facilities and services as essential components of such housing;

iv) Recognize the close relationship between housing and other social policy areas, such as health, education, employment and family stability;

v) Incorporate the social goals of housing as explicit statements in national development plans, and ensure that statements of goals are transformed into concrete programmes with measurable effects.

(2) There should be the required institutional framework in place and in sufficient scale. There is already the institutional framework and what is needed is the effectiveness in meeting the objectives set out in the national housing policy. There is the National Housing Corporation which is the sole government agency helping in assisting individuals in rural areas construct decent houses. If there is to be any hope at all of even coming close to addressing the huge deficit,

the Corporation must substantially increase the levels of
investment in the rural housing sector. And inorder to be   efficient,
there should be decentralisation of the National Housing Corporation to the provinces
to save people from travelling long distances to Nairobi to solve their
problems.   This would be in accordance with the district
focus for rural development and officers from the Corporation
would be able to assess the situation and assist loanees from
the ground.   In this way, the activities of the Corporation
would be understood   from the grassroot levels where people
who really need assistance are living, hence reduce the
imbalance in the number of people financed from the   provinces.
There are people in the rural areas who are not aware of the
existence of the Rural Housing Loans Scheme.   From the field
survey, 52.8% of those interviewed stated that they have never
heard of the scheme.

In the rural areas, cultural diversity and the different
standards required by divergent climates or regions makes
it impossible to adopt uniform standards.   Therefore the
adoption of flexible housing standards that incorporate user
requirements and users' culturally-based preferences is made
more difficult because housing standards and housing programmes
tend to be administered by central agencies.   Households
should therefore participate in deciding on acceptable housing
standards.   Housing decisions controlled by households
themselves generate a great deal of wealth in proportion to
their income.   On the other hand, households housed through
locally self-government systems have higher standard homes

than those provided by unsubsidized, centrally administered

systems. At the same time they have a far healthier social

environments than their heteronomous substitutes, whether

subsidized or not. Turner[1] says that "deficiencies and

imperfections in one's housing are infinitely more tolerable

if they are his responsibility than if they are somebody else's".

He further said that:

> when dwellers control the major decisions and free to
> make their own contribution to the design, construction
> or management of their housing, both the process and
> the environment produced stimulate individual and social
> well-being. When people have no control over, nor
> responsibility for key decisions in the housing process,
> on the other hand, dwelling environments may instead
> become a barrier to personal fulfillment and a burden
> on the economy[2].

Although little study has been undertaken to find out

how well the traditional structures perform in Kenya, it should

be appreciated that if changes are introduced into the design

and construction without tests or research, there will in most

cases be a decline in the general quality of the house. Therefore

it should be realised that prototype designs are not always

suitable or practicable as they tend to aggregate cultural

differences. A particular house design may not be imposed

upon a people, so that a family that is going to build and live

in a house should take the decisions on the design. Effective

popular participation should help to minimize the cultural and

communication gap between the designer and the user.

The formulation of housing standards cannot rely upon the subjective preferences of administrators. The belief that the expert knows better than the people themselves what is best for them is a misinterpretation of the expert's function. This problem occurs when planners work on the assumption that they are basing their activities on a pure, objective knowledge of human nature - while in fact they are basing their actions on their own opinions, opinions shaped by normative factors derived from the social and cultural backgrounds of the planners. However, any architectural or planning design problem tackled with adequate research and resources will always yield some increase in design efficiency. Better design achieves better results with fewer resources.

House Design

This study should not be regarded as a bye-law but instead as a collection of ideas and recommendations to be used with discretion, considering the actual available resources. However, when giving advice on design for self-help housing, it must be remembered that different families have different needs and desires concerning housing and that the resources (work and money) they can set aside for building purposes also varies considerably. As already pointed out, a particular house design should never be imposed upon self-help builders against their will. On the other hand, this does not mean that people in the villages do not need any kind of advice, guidance or information concerning design of houses. Before

starting to build on a new plot, some kind of simple plan for
how the plot is going to be utilized should be made.   The
plot   should be divided into areas for different purposes:
for example; areas for housing, for cultivation, for keeping
cattle and so on.   The front part of the plot is usually
the most natural to utilize for housing.   Reasons for this are,
for instance, that connections to present or future
infrastructural services (e.g. piped water or electricity)
can be made short and consequently cheap and that dirtier
functions (e.g. waste disposal and cattle keeping) can be
accommodated at the back of the plot, away from neighbours
and public spaces.   However, other factors, such as
topography, soil conditions and vegetation might imply
other, more suitable, locations for the house.

Waste disposal is another problem of hygiene that must
be considered in the lay-out of the plot.   Human faeces are
one of the main sources for spread of disease in rural areas.
A place for a latrine and a special area for refuse disposal
should be included in the plot lay-out.   A pit latrine must
therefore   not be built closer than 10 metres to houses where
people live or where food is prepared or food and water stored.
In rural areas the pit latrine will, for many years to come,
be the most common solution.   The site for the pit latrine
should be well drained to avoid flooding.   A pit latrine consists
of a hand-dug hole covered with a properly built slab and
a simple shelter.   It should be as deep as possible to be sufficient
for several years use and as narrow as possible to be easily covered
with a slab.   The minimum depth should be 2.0m but a depth of 3.0m
or more is preferable.   Ordinary household refuse can also cause health
hazards if not properly disposed of. Refuse must not be thrown all

around the site but should be collected in one place where it is dumped in a pit dug for refuse collection.

There is no single uniform traditional way for grouping and orientation of houses and adjacent out-door spaces in rural Kenya. However, local traditions are usually based on social and climatic considerations and must be allowed to have a great influence on orientation and arrangement of houses. It is desirable to protect the walls of a house from the sun as much as possible, in order to reduce the indoor temperature. This is achieved most easily by orienting the house so that the short walls face the low morning and evening sun, i.e. east and west.

House design is a complex process. The traditional use of house is such that many daily activities take place out of doors and therefore much attention should be given to the layout of spaces around and between houses as to the specific house layout. A common quality in most traditional rural housing is the possibility for expansion, either as an extension (addition of extra rooms) of an existing house or as an addition of new houses. This quality should be retained because it allows a family to build their houses in stages according to their needs and resources. In other words, a family who can only afford to begin with one small house can later, step by step, improve their housing situation by adding extra rooms to their house or by building additional houses. This expansion by steps must be expected to take considerable time (several years) but is nevertheless, for

most rural families, the most realistic way to achieve
improved housing conditions and must therefore be planned
for.

In house design, there is accommodation of various activities
such as space for sleeping, space for meeting and resting,
space for taking meals, space for reading and writing, space
for preparing and cooking food etc. The preparation and
cooking of food can take place inside a house, in a separate
outbuilding, or simply out of doors. A kitchen in a separate
outbuilding is often preferred to cooking in a house where
people sleep because of problems of smoke from the open fire.
It is very important to keep the space for preparing and cooking
food clean. Activities like meeting to talk and may be drinking
some beer, receiving and entertaining guests or simply
sitting down to rest, form an important and valuable part
of daily life. To a large extent, this type of activity takes
place out of doors. However, there should be an indoor
space (living room) for this kind of activity that can be used
when the weather is bad and during the evening. The space
should be large enough to allow all household members and
some guests to come together. It is difficult to state a
specific area, but !9 -I2m^2 would probably be sufficient for
most households. The same space can be used for taking
meals, reading and writing, and even sleeping by young
children.

One of the most obvious purposes of a house is to provide shelter for sleeping. A sound sleep is necessary to enable man to work efficiently. To make a house as useful as possible, rooms for sleeping should be large enough to be used for many purposes as is the case in most traditional house-types. The area of a sleeping room should therefore preferably not be less than 6m². It should be able to accommodate three sleeping spaces with adequate circulation space between them. With "sleeping space" is here meant a space with the size of a bed, preferably 1.0 x 2.0m. The width of a sleeping room should not be less than 2.1m, which gives sufficient space for placing a bed along the short wall. There is no absolute rule concerning the minimum area per person in sleeping rooms. However, the following recommendation, based on hygienic considerations, can be used as a guiding principle: A room used for sleeping should have a <u>minimum</u> area of 2m² per person. The desirable number of rooms for sleeping naturally depends on the number of household members and the size of the rooms but also on local customs, concerning who can share a sleeping room with whom. The tradition of not allowing older children to sleep in the same house as their parents has to be considered. This therefore justifies the minimum number of rooms in a house of 3 to be capable of providing adequate shelter i.e. sleeping room, living room which can be used for other activities as well, and another room for children and other visitors.

Building Materials and Construction

The main principle for choice of materials and method
of construction should be to utilize local, traditionally used
building materials and methods of construction as far as
possible. Traditional local materials are easy to maintain
or replace. Constructions and materials are often well-suited
to the climatic conditions apart from being usually very cheap
and easily available. The use of local materials would
encourage local production and this will contribute to the
economic development of the rural areas. However, many
of the traditional materials have the disadvantage of not being
very durable, even if they are easy to maintain. The
non-durability of traditional building materials is reflected
in the average age of 6 years of the housing stock in Siaya
District as reflected from survey results.

It is not the intention here to show, in detail, every
possible combination of materials and construction methods
for rural houses. Rather, some simple alternatives are discussed.
From the field survey, 90.4% of the houses assessed in rural
Siaya District had no foundation at all. The lack of
foundations is one of the most serious problems in rural housing
today. Walls with no foundation are easily damaged at the
base by rain and moisture from the ground. The soil that
supports the wall can also be eroded away and cause the
wall to crack or even collapse. A very good, cheap and
foundation can be made of stones. A foundation trench is
dug deep enough to reach firm soil, free from roots. A depth

of 300 - 40mm is in most cases adequate. If a mud and pole wall is to be erected, the vertical poles are placed in the trench when the stones are laid. The poles can be embedded in mortar to protect the wall base.

Walls made from soil (mud and pole, soil blocks, monolithic soil) will, for many years to come, be the only realistic alternative for a majority of rural population. Therefore the utilisation of earth in house construction is the oldest and most common methods used by a bigger percentage of the developing countries. Soil walls can be a very good and durable solution if the main disadvantages, i.e. poor and very low load bearing capacity, low resistance to moisture destructive effect, low binding strength for its particles, very high water absorption ratio , very high shrinkage/swelling ratio and low resistance to wear , are mitiga ted. However, it is possible to build for the rural population, cheaply and humanly by the use of earth for building and by teaching people to build themselves using improved technology. The housing problem in rural areas can be reduced by a new form of partnership. What rural households have to put into the partnership is essentially their labour. They also have the possibility of acquiring, at essentially no cost, only one possible building material, earth which is the most readily available and cheap material found everywhere. It is easy to work with, requires less skills and as such, it encourages and facilities unskilled individuals and groups of people to participate in their house construction on self-help basis.

With these two things, labour and earth, they can do a great
deal to improve the housing conditions. The good quality
of earth as a building material include high and perfect resistance
to fire destruction, very high heat/thermal insulating value,
good noise absorbent etc.

As for roofing, thatch is still the most common roof
covering in the rural areas of Siaya Distirct. Of the total
number of houses assessed 62.8% are of thatch. However,
the use of "modern" building materials such as galvanised
corrugated iron sheets for roofing becomes a necessity
because of the shortage of thatch. Galvanised corrugated
iron sheets are easy to transport, require only a simple
supporting structure, require little skill for construction
and are water-tight. Because of the serious shortage of
thatch for roofing, 90.2% of household heads interviewed
considered roof construction as the most costly house
component. If the government is committed to the policy of
accelerating and improving housing in the rural areas and
sought to ensure genuine and sincere co-operation from the
people, there is the possibility of making a significant
improvement in rural housing by firancing the replacement
of one essential item as the roof. The single most deficient
item in rural homes in Siaya District is the roof. Because
of the high cost of roofing material, the government should
start roof loan scheme to enable people purchase corrugated
iron sheets. Improvements of other house component can
follow as finance becomes available. Regarding form of
assistance preferred in housing improvement, 68.8% of those

interviewed preferred material assistance.

More attention for maintenance is justified. The
difference in the duration of life of houses between the
various parts of the district and the type of building materials
used, underline the importance of regular and appropriate
maintenance.

Summary

In a rapidly developing country such as Kenya, the
basic concern is that the fruits of economic development should
be directed increasingly to the improvement of the conditions
of living for the majority of the people whose incomes fall
below an acceptable level for basic needs. Housing should
be made a priority and be seen as part of economic, social
and environmental development. However, it is my conviction
that an approach to housing in this country is piecemeal
if it excludes rural housing. It should be realised that low-cost
houses are beyond the financial capacity of most rural men,
and lending institutions from which rural building developers
are likely to seek loans require securities and guarantees
unobtainable for most rural men, On the other hand, it is
a fact that most wananchi fervently wish to own modern houses
but fail to do so because the means do not match the wish. Therefore
neglect of their housing conditions is a fundamental error.

Proposals for Rural Housing Improvement

In finding a solution to the rural housing problem, it is
pertinent to ask ourselves what action we need to take to
improve the housing of rural Kenyans, and whether proposals
put forward would be feasible under existing conditions
without necessarily seeking development funds from outside
the country. There is need to start with the rural man himself,
for he is the greatest agent of rural development available.
It seems reasonable to start by educating the rural man and
rely on him to use the knowledge to uplift quality of his hut.
The required knowledge can simply be summarised as:

    1) Knowledge of materials: their strength, durability,
       and quality;

    2) Knowledge of sound construction methods;

    3) Knowledge of sanitary, drainage, refuse disposal
       and safety regulations.

It is not even necessary that the government spends
a lot of money in the improvement of shelter in rural areas.
With proper guidance they would be able to utilise the materials
at their disposal to build comfortable and healthy accommodation.
They should not be left alone to put up shelters where
important factors like ventilation and fire prevention are
completely neglected. Accordingly, the government should
encourage the study of traditional housing, comprising the
hut in its various forms.

Through the Ministry of Local Government, and
consulting with Works, Housing and Physical Planning Ministry,
the government should initiate, encourage and promote the
making of varied model plans, drawn up taking into account
the different local conditions and the materials available.
Copies of these should be made available to local authorities,
particularly County Councils, and at the chief's offices with
a handful of technically qualified officers to guide those who
wish to put up shelter.

The following implementations must be made:

1) Organise lectures and using local architects and
   local authority technicians, discuss and demonstrate
   hut construction regulations, with local chiefs in
   attendance.

2) Make a house model at location centre and
   encourage builders to emulate the example.

3) Encourage wananchi to obey health regulations
   relating to the house. This should be done by
   Country Health Officers. The local administration
   could require individuals to improve the accommodation
   they live in to protect their health and safety.

4) Encourage provincial and district administration
   officers in conjunction with local councillors where
   possible to "preach the gospel" of house improvement.

Before the implementation of the proposals, there is
need to carry out an assessment of the housing conditions
in the rural areas of Kenya, noting the available building
materials. Then this should be followed by research on the

the soil types to decide on the best methods of
improvement. The choice of method to use in improving
on earth qualities inorder for it to offer better performance
in building performance depends on type of soil, the intended
use and required improvement; and the climatic conditions
of the area where the products are to be used.

In Chapter 5 the estimated housing need (E_t) is 102,758
housing units required between 1985 and 1991 in order to provide
the whole population in Siaya District with adequate housing as
described in Chapter I. This is an impossible task because
it requires that houses to be put up between now and period
covered have to meet the minimum standards specified. In
view of the priorities stated by Siaya people, it can only be
hoped that some improvements might be effected so as to reduce
the number of housing units that are in deplorable state.

Areas for further research

This study draws the general conclusion that there exists
a relationship between housing conditions and the building materials
used in rural areas. It, however, draws a further conclusion
that thatch and mud are still the easily available building materials;
and that income per se is not a major determinant of the type
of house that one lives in, in rural areas.

There is need to carry out studies for appropriate room
occupancy based on present and future projected household sizes.
Such studies would enable conclusions to be drawn on appropriate
concept of "a rural house", house sizes, etc. and what people
really want in the rural areas .

It is further recommended that financing of rural housing should be studied including its implications on the housing policy for rural areas.

It is finally recommended that further research should be carried out in other parts of the country with different climatic influences to determine what criteria determines when to build and replace a house in rural areas. This will then enable one to determine what variables contribute to failures in the traditional construction methods. Research is therefore necessary to draw on the experience of traditional artisans to enable construction in rural areas to keep pace with other developments.

FOOTNOTES

1.   John F.C. Turner, <u>Housing By people: Towards Autonomy in Building Environments</u>, Pantheon Books, New York, 1976, p.xxxii

2.   Ibid.

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QUESTIONNAIRE ADMINISTRATION

RURAL HOUSING SURVEY - 1985

NAME OF RESPONDENT:

SUB-LOCATION:

LOCATION:

DISTRICT:

INTERVIEWER:

DATE:

A. PERSONAL DETAILS OF THE HOUSEHOLD HEAD (HH)

1. Composition of the household.

Head of Household: Sex   Age   Main Occupation   Size

Other Activities

2 (a) How much land do you own (including homestead)..........
hectares

(b) Do you have a title deed? (i) Yes   (ii) No

3. (a) How many hectares do you normally use for crops? ....

(b) Which are the crops that you normally grow?

_____   _____   _____

_____   _____   _____

4. Which are the activities that some members of the household
are engaged in?

_____   _____   _____

_____   _____   _____

5. Please indicate the income group to which you belong.

   (i)   Under Kshs. 400 per month

   (ii)   Between Kshs. 400 and 800 per month.

   (iii)   Between Kshs. 801 and 1200 per month.

   (iv)   Between Kshs. 1201 and 1600 per month.

   (v)   Over Kshs. 1600 per month.

6. How many houses/buildings are in the homestead and what are their functions?

   _____   _____

   _____   _____

   _____   _____

B. CONSTRUCTION DETAILS OF EXISTING HOUSES

7. (a) What is the architectural style (form) of the house?

        (i) round   (ii) rectangular   (iii) square

   (b) Give the reason for the form taken by your house

        (i) Custom and tradition (norm)   (ii) Climate

        (iii) No reason   (iv) Nature of building materials.

8. What is the type/form of construction of the house?

   (i) Permanent   (ii) Semi-permanent   (iii) Temporary.

9. How many rooms are contained in the house?

   (i) One   (ii) Two   (iii) Three   (iv) Four and above (state)

10. Foundation type

    (i) Poles in earth   (ii) Mud foundation   (iii) Concrete

    (iv) Loose stones (natural stone or dressed)

    (v) Stones with cement lining.

11. Floor type

    (i) Earth (ii) Earth with clay plaster (iii) Cement Screed

    (iv) Rough concrete (v) Concrete with surface finish

    (vi) Wood.

12. Floor condition

    (i) Satisfactory (ii) Bad, needs repair/improvement

    (iii) Very bad, needs replacement.

13. Wall type

    (i) Mud and Wattle (ii) Rammed earth (or mud bricks)

    (iii) Wood (timber) (iv) Corrugated iron sheets (mabati)

    (v) Quarry stone blocks (vi) Concrete blocks (sand/

    Cement) (vii) Fired bricks.

14. Wall surface treatment

    (i) Clay plaster (ii) Cow-dung plaster

    (iii) Cement wash (iv) Cement screed finish

    (v) Cement plaster/painted (vi) No treatment.

15. Wall Condition

    (i) Satisfactory (ii) Bad, needs repair/improvement

    (iii) Very bad, needs replacement.

16. Roof type

    (i) Thatch (ii) Corrugated iron sheets, frame of round

    poles (iii) Corrugated iron sheets, frame of sawn timber

    (iv) Tins (v) Tiles.

17. Roof condition

    (i) Satisfactory (ii) Bad, nees repair/improvement

    (iii) Very bad, needs replacement.

18. (a) Do you consider your house adequate and
satisfactory? (i) Yes/no (ii) If no, state the
problem.

    (b) How is the general housing condition. ?

        (i) Satisfactory (ii) Bad, needs repair/improvement

        (iii) Very bad, needs replacement.

19. (a) How many years ago was the house built? ....·

    (b) Has the house been repaired/improved/maintained
since it was built?

        (i) Only the walls occasionally

        (ii) Walls are plastered regularly

        .(iii) Only the roof occasionally

        (iv) Walls regularly, and roof when leaking

        (v) Floors are plastered regularly

        (iv) No.

20. Who built the house?

    (i) Owner only (ii) Owner with family and friends.

    (iii) ditto, with fundi for roof (iv) ditto, with fundi for

roof, doors and windows (v) ditto, with fundi for doors and window
(vi) fundi only.

21. How did you obtain the poles (timber)?

    (i) From an old house (ii) From own land

    (iii) Got free nearby (iv) Bought.

22. In case of thatched roof, how did you obtain the grass?

    (i) From own land (ii) Got free nearby

    (iii) Bought.

23.   In case of <u>Mabati</u> roof, how did you obtain <u>mabati</u>?

    (i)   From old house   (ii)   Bought.

24.   In case of permanent house, how did you get stones,

    blocks, bricks etc?

    (i)   Self-made   (ii)   Bought.

25.   How much money did the house cost?

    (i)   Labour   (in Kshs.)   _____

    (ii)   Materials (in Kshs.)   _____

    (iii)   Total (in Kshs.)   _____

26.   Which house component do you consider costly?

    (i)   Wall   (ii)   Roof   (iii)   Floor.

27.   How were you able to finance the construction of

    the house?

    (i)   Farming   (ii)   Self-employment   (iii)   Paid job.

    (iv)   Funds from relatives (v)   Borrowed money from

    private sector (specify) (vi)   Loan from public

    sector (specify).

C.   SERVICES AND AMENITIES

28.   What is the main source of water supply?

    (a)   <u>During wet Season</u>   (b)   <u>During dry season</u>

    (i)   Stream (river)   (i)

    (ii)   Communal well/pond   (ii)

    (iii)   Communal tap   (iii)

    (iv)   Borehole   (iv)

    (v)   Roof catchment   (v)

    (vi)   Piped water in compound/ (vi)
        house

    (vii)   Lake   (vii)

29.   What type of toilet do you have?

     (i)   Pit latrine

     (ii) Water-borne sanitation

     (iii) No latrine.

D.   PEOPLE'S ASPIRATIONS AND HOUSING PERCEPTION

30.   What type of house do you consider adequate and satisfactory?

    (a) in terms of rooms

    (i) One   (ii) Two   (iii) Three   (iv) Four and above (state)

    (b) in terms of materials of construction

    (i) Permanent   (ii) Semi-permanent   (iii) Temporary.

31.   If your yearly income was doubled or if you could get a substantial loan, what would be your priorities of spending the extra income.

    (i)   Improve housing

    (ii) Educate children

    (iii) Start business

    (iv) Venture into large scale farming

    (v)   Buy furniture.

32.   If at all, you are to be given assistance for the improvement of housing, which form would you prefer?

    (i)   Material assistance   (ii) Cash.

33. If you are to improve your housing conditions, with what would you start?

    (i)   Replace roof with better building material (gci)

    (ii) Make more living space (bigger house)

    (iii) Construct or improve toilet

    (iv) Improve the walls

    (v) Improve the floor.

34. Are you aware of the rural housing loan scheme of the Government through National Housing Corporation (NHC)?

    (i) Yes/No.

Drawn by Olima, W.H.A.

August 1985

DATA ANALYSIS (ASSESSMENT) FORM

A. PERSONAL DETAILS OF HOUSEHOLD HEADS (HH)

I. Sex

Males .... % of those interviewed

Females .... % of those interviewed.

Age (in years)

(1)   Between 20 and 29 .... % of those interviewed

(2)   Between 30 and 39 .... % "   "   "

(3)   Between 40 and 49 .... % "   "   "

(4)   Between 50 and 59 .... % "   "   "

(5)   Between 60 and 69 .... % "   "   "

(6)   70 and above .... %   "   "   "

Main Occupation

(1) Farming .... % of those interviewed

(2) Teaching .... % "   "   "

(3) Others (Business etc.) .... % "   "   "

Other Activities

(1)   Farming .... %   of those interviewed

(2)   Business .... %   "   "   "

(3)   Cattle rearing .... %   "   "   "

(4)   Others .... %   "   "   "

(5)   None .... %   "   "   "

Number of household members (Household size)

(1)   Between 2 and 6 .... %   of those interviewed

(2)   Between 7 and 11 .... %   "   "   "

(3)   Between 12 and 16 .... %   "   "   "

(4)   17 and above .... %   "   "   "

2.　(a)　Land owned in hectares (including homestead).

(1)　Under 2.0　.................% of those interviewed

(2)　Between 2.0 and 4.0 ....% "　　"　　　　"

(3)　Between 4.1 and 6.5 ....% "　　"　　　　"

(4)　Between 6.6 and 8.9 ....% "　　"　　　　"

(5)　Over 8.9　..................% "　　"　　　　"

(b)　Land Title Deeds

(1)　Those with title deeds ....% of those interviewed

(2)　Those without title deeds ......% "　　"　　　　"

3.　(a)　Land under crops in hectares

(1)　Under　0.8　.............%　　　"　　"　　　　"

(2)　Between 0.8 and 1.6 ....%　　"　　"　　　　"

(3)　Between 1.7 and 2.8 ....%　　"　　"　　　　"

(4)　Over 2.8 ....%　　　　　"　　"　　　　"

(5)　None ....%　　　　　　"　　"　　　　"

(b)　Crops normally grown .

(1)　Subsistence only ....%　　"　　"　　　　"

(2)　Cash crops only ....%　　"　　"　　　　"

(3)　Subsistence + Cash crops .....% "　　"　　　　"

4.　Activities that some members of the household are

engaged in

(1)　Farming ....% of those interviewed

(2)　Other employment

.　(Teaching, business, public　·
and private sector employees)....... % of those interviewed

(3)　None ....%　　　　　　"　　"　　　　"

5.   Salary/Income in Kshs. per month

    (1)   Under 400/- ....%   of those interviewed

    (2)   Between 400/- and 800/- ....%   "   "   "

    (3)   Between 801/- and 1200/- ....% "   "   "

    (4)   Between 1201/- and 1600/- ......% "   "   "

    (5)   Over 1600/- ....%   "   "   "

6.   Number of Houses/Buildings in the homestead

    (1)   Between 1 and 4 ....% of homesteads visited

    (2)   Between 5 and 8 ....% "   "   "

    (3)   Between 9 and 12 ....% "   "   "
    (4)   Over 12 ....%   "   "   "

B.   CONSTRUCTION DETAILS OF EXISTING HOUSES

7.   (a)   Architectural style (or form) of houses

      (1)   Round ....% of houses assessed

      (2)   Rectangular ......% "   "   "

      (3)   Square ......%   "   "   "

    (b)   Reason given for the form taken

      (i)   Custom and tradition (norm) .....% of those interviewed

      (ii)   Climate   ....%   "   "   "

      (iii)   No reason ....%   "   "   "

      (iv)   Nature of building materials ....%"   "   "

8.   Form/Type of construction

    (i)   Permanent ....% of houses assessed

    (ii) Semi-permanent .....% of   "   "

    (iii) Temporary ......   % "   "   "

9. Number of rooms in the existing houses

 (i) One ....%   of houses assessed

 (ii) Two ....%   " "   "

 (iii) Three ....%   " "   "

 (iv) Four and above ....% " "·   "

10. Foundation type

 (i) Poles in earth ....% of houses assessed

 (ii) Mud foundation ....% " "   "

 (iii) Concrete ....%   " "   "

 (iv) Loose stones (natural or dressed) ....% of houses assessed

 (v) Stones with cement lining ....% ·" "   "

11. Floor type

 (i)· Earth ....% of houses assessed

 (ii) Earth with clay ....% " "   "

 (iii) Cement Screed ....% " "   "

 (iv) Rough concrete ....% " "   "

 (v) Concrete with surface finish " "   "

 (vi) Wood   " "   "

12. Floor condition

 (i) Satisfactory ....% " "   "

 (ii) Bad, needs repair/improvement

    ....% " "   "

 (iii) Very bad, needs replacement

    ....% " "   "

13. Wall type

    (i)   Mud and wattle ....% of houses assessed

    (ii)   Rammed earth (or mud bricks)....% "   "   "

    (iii) Wood (timber) ....%   "   "   "

    (iv)   Corrugated iron sheets
            (mabati) ....%   "   "   "

    (v)   Quarry stone blocks ....%   "   "   "

    (vi)   Concrete blocks
            (cement/sand) ....%   "   "   "

    (vii) Fired bricks ....%   "   "   "

14. Wall surface treatment

    (i)   Clay plaster ....%   "   "   "

    (ii) Cow-dung plaster ....%   "   "   "

    (iii) Cement wash ....%   "   "   "

    (iv) Cement screed finish ....%   "   "   "

    (v)   Cement plaster/painted ......%   "   "   "

    (vi) No treatment ....%   "   "   "

15. Wall condition

    (i)   Satisfactory ....%   of houses assessed

    (ii)   Bad, needs repair/improvement
            ....%   "   "   "

    (iii) Very bad, needs replacement
            ....%   "   "   "

16. Roof type

    (i)   Thatch ....%   of houses assessed

    (ii)   Corrugated iron sheets,

           frame of round poles ....%   "   "   "

    (iii) Corrugated iron sheets,

           frame of sawn timber ....%   "   "   "

    (iv)   Tins   ....%   "   "   "

    (v)   Tiles ....%   "   "   "

17. Roof condition

    (i)   Satisfactory ....%   "   "   "

    (ii)   Bad, needs repair/improvement

           ....%   "   "   "

    (iii) Very bad, needs replacement

           ....%   "   "   "

18. (a) Those who consider their houses adequate

        and satisfactory ....%   of those interviewed

    (b) General housing conditions

        (i) Satisfactory ....%   of houses assessed

        (ii) Bad, needs repair/

            improvement ....%   "   "   "

        (iii) Very bad, needs replacement

            ....%   "   "   "

19. (a) Age of the houses (in years)

    (i)   Between 1 and 5 ....%   "   "   "

    (2)   Between 6 and 10 ....%   "   "   "

    (3)   Between 11 and 15 ....%   "   "   "

    (4)   Over 15 ....%   -"   "   "

19 (Cont'd)

    (b)   Maintenance/repair/improvement of the houses

        (i)   Only the walls occasionally ......% of total answers

        (ii)   Walls are plastered regularly .....% " " "

        (iii)   Only the roof occasionally .....% " " "

        (iv)   Walls regularly, roof when

               leaking ....%   . " " "

        (v)   Floors are plastered regularly ..... " " "

        (vi)   No   ....%   " " "

20.   House builder

    (i) Owner only ....%   of houses

    (ii) Owner with family and friends ....% " "

    (iii) Ditto, with fundi for roof ....% " "

    (iv) Ditto, with fundi for roof, doors/

        windows ....%   " "

    (v)   Ditto, with fundi for doors/

        windows ....%   " "

    (vi) Fundi only.

21.   Source of timber/poles

    (i)   From an old house ......%   of total answers

    (ii)   From own land ....% " " "

    (iii) Got free nearby ....% " " "

    (iv) Bought ....% " " "

22. Source of Thatch

   (i)   From own land ....% of total thatched houses

   (ii)   Got free nearby ......% "   "   "   "

   (iii) Bought ....%   "   "   "   "

23. Source of Mabati (gci)

   (i)   Got from old house ....% of houses with gci roofs

   (ii)   Bought ....%   "   "   " "   "

24. Source of stones/Blocks/Bricks

   (i). Self-made ....% of permanent houses

   (ii)   Bought ....% "   "   "

25. (i) Labour cost of the houses.

      (1) Less than Kshs. 150/- ......% of the houses

      (2) Between Kshs.150 and

          Kshs. 750/-   ......% "   "   "

      (3) Over Kshs. 750/   ......% "   "   "

  (ii) Material cost of the houses

      (i) Less than Kshs. 500/- .....% "   "   "

      (2) Between Kshs. 500/- and

          Kshs. 1500/-   ....% "   "   "

      (3) Between Kshs. 1501/- and

          KShs. 3000/-   ....,%   "   "   "

      (4) Over Kshs.3000/- .....%   "   "   "

  (iii) Total cost of houses

      (1)   Less than Kshs. 800/- ....% "   "   "

      (2)   Between Kshs.800/
           and Kshs.2000/- ....% "   "   "

25 (cont'd)

        (3)   Between Kshs. 2001. and

                Kshs. 4000/- ....%   of the houses

        (4)   Over Kshs. 4000/ .....%   "   "   "

26.   House component considered costly

    (i)   Wall   ....% of those interviewed

    (ii) Roof   ...,........% "   "   "

    (iii) Floor   ....% "   "   "

27.   .Financing. of the house

    (i)   Farming   ....%   of those interviewed

    (ii) Self-employment ....%.   "   "   "

    (iii) Paid job   ....%   "   "   "

    (iv) Funds from relatives ....%   "   "   "

    (v) . Borrowed money from the private

        sector   ....%   "   "   "

    (vi) · Loan from the .public sector ...% "   "   "

C.   SERVICES AND AMENITIES

28.   · (a) Main sources of water during wet season.

        (i)   Stream (river) ....%   of those interviewed

        (ii) Communal well/pond ......% "   "   "

        (iii) Communal tap ....%   "   "   "

        (iv) Borehole ....%   "   "   "

        (v)   Roof catchment ....%   "   "   "

        (vi) Piped water in Compound/
             house ....%   "   "   "
        (viii) Lake   ....% " "   "

28 (cont'd)

    (b) Sources of water during dry season

        (i)   Stream (river) ....% of those interviewed

        (ii) Communal well/pond ....% "   "   "

        (iii) Communal tap ....%   " . "   "

        (iv) Bore hole ....%   "   "   "

        (v)   Roof catchment ....%   "   "   "

        (vi) Piped water in compound/

             house   ....%   "   "   "

        (vil) Lake ....%   "   "   "

29.   Type of toilet

        (i)   Pit latrine ....%   of homesteads

      (ii) Water-borne sanitation .....%   "   "

      (iii) No latrine ....%   "   "

D.   PEOPLE'S ASPIRATIONS AND HOUSING PERCEPTION

30.   (a) Number of rooms considered adequate and satisfactory

        (I)   One   ....%   of those interviewed

        (2)   Two   ....%   "   "   "

        (3)   Three   ....%   "   "   "

        (4)   Four and above ......%   "   "   "

    (b) Adequate and satisfactory house in terms of

        materials of construction

        (i)   Permanent   ....% of those interviewed

        (ii)   Semi-permanent ....% "   "   "

        (iii)   Temporary ....%   "   "   "

31. Priorities of spending extra income

    (i)   Improving housing .... %   of those interviewed

    (ii)   Educating children .... %   "   "   "

    (iii)   Business   .... %   "   "   "

    (iv)   Large-scale farming .... %   "   "   "

    (v)   Buying furniture .... %   "   "   "

32. Form of assistance preferred in housing improvement.

    (i)   Materials assistance .... %   of those interviewed

    (ii)   Cash .... %   "   "   "

33. What to start with when improving housing conditions

    (i)   Replace roof with better building

        materials (gci) .... %   of those interviewed

    (ii)   Make more living space (bigger

        house) .... %   "   "   "

    (iii)   Construct or improve toilet .... % "   "   "

    (iv)   Improve the walls .... %   "   "   "

    (v)   Improve the floor .... %   "   "   "

34. Those who are aware of the existence of the rural

    housing loan scheme administered by

    NHC .... %   of those interviewed.

Designed by Olima, W.H.A.

December 1985

APPENDIX 3

HOUSING QUALITY MEASURED IN POINTS USING THE

SCORE SYSTEM

1.   Floor condition   Points

       (i)   Good   2

       (ii)   Bad, needs improvement/maintenance   1

       (iii)   Very bad, needs replacement   0

2.   Wall condition

       (i)   Good   2

       (ii)   Bad, needs improvement/maintenance   1

       (iii)   Very bad, needs replacement   0

3.   Roof Condition

       (i)   Good   4

       (ii)   Bad, needs improvement/maintenance   2

       (iii)   Very bad, needs replacement   0

4.   Water supply

       (i)   Communal tap or piped water in house   2

       (ii)   River or well near the house/and others 0

5.   Sanitation

       (i)   Septic tank, sewer/pit latrine   2

       (ii)   No latrine   0

6.   Internal (modern)/separate kitchen   2

     No kitchen   0

7.   Size of houses in terms of rooms

       (i)   3 and above   3

       (ii)   2   1

       (iii)   1   0

The total score to be obtained by a household amounts to 17. Scores of individual household are then grouped according to the following classification to determine the housing quality.

0 - 5	=	Very bad
6 - 7	=	Bad
8 - 10	=	Average
11 - 13	=	Good
≥ 14	=	Very good

APPENDIX 4

PROCEDURE FOLLOWED IN PROCESSING OF RURAL
HOUSING LOANS

1. On receipt of the following documents, a file is opened:-

    (a) A duly completed application form witnessed
         by a local Administrator to ascertain information
         therein is true.

    (b) A letter from employer or audited financial
         statements as proof of the applicant's income.

    (c) Building plans of the proposed house.

    (d) Applicant's passport size photograph.

    (e) Two photographs of the proposed house.

    (f) A copy of the National I/D card or Passport.

2. On ascertaining that ALL requirements are in order, the
    file is forwarded to Quantity Surveying Section to
    calculate the estimated cost of construction.

3. The application is then acknowledged and loanee is advised
    of the estimated cost of construction and is asked to
    confirm when over 50% of the construction is completed so that an
    inspection can be carried out.

4. The field officer is advised to carry out a comprehensive
    inspection of the proposed house using a standard format.

5.   The inspection report is then forwarded to Quantity
        Surveying Section for purposes of calculating percentage
        of completion and in turn advise RHO.

6.   RHO then studies the report noting the field officer's
        comments as to whether the proposed house meets the
        Corporation's guidelines.

7.   If the proposed house meets the guidelines, the applicants
        name is posted on the waiting list and he/she is
        informed accordingly.

8.   The waiting list is prepared on District basis and is
        always updated before and after every funds allocation.

9.   After a funds allocation, a letter of offer is sent to
        successful loanees specially asking for security and
        letter from employer confirming that the employer will
        remit monthly payments directly to the Corporation.
        A Banker's order is acceptable for those in self-employment.
        The letter of offer specifically stipulates that in cases
        where a loanee does not have a title deed, a guarantee can
        be executed in favour of the Corporation, provided loan
        releaseable does not exceed Kshs. 40,000/- (K£2000).

10.   On acceptance of offer and submission of the requirements
        contained therein in the letter of offer, our Lawyers
        are advised to prepare the security. In cases where title
        deed offered is for the piece of land where the
        proposed house is being constructed, no valuation
        is done. In all other cases, a current valuation to
        by Corporation appointed valuers is carried out to

determine market value. The loan releaseable
SHOULD NOT exceed the current value of the
security given.

11.   On execution of the charge OR a guarantee and loan
agreement, 50% of the loan (subject to a maximum
of K£2000) is released.

12.   Balance of the loan is releaseable when a charge over
some property has been registered in favour of the
Corporation PROVIDED construction of the proposed
house is over 75% and there are no arrears.

13.   In cases where a guarantee ONLY has been executed,
Balance of loan is not releaseable.

14.   In ALL cases, the maximum loan that can be advanced is
K£4000.

National Housing Corporation

House No.	Dependent Variable Y	X_1	X_2	X_3	X_4	X_5	X_6
1	15	3	1	1	6	5	14
2	15	3	0	1	2	4	6
3	15	4	1	1	12	3	7
4	13	4	0	1	13	6	17
5	17	4	0	1	6	10	11
6	17	1	1	1	7	3	3
7	13	4	1	1	9	1	8
8	13	4	1	1	21	4	13
10	13	3	0	1	3	2	7
11	15	3	0	1	4	3	8
12	14	3	0	1	11	7	9
13	15	4	0	1	15	3	29
14	15	2	0	1	6	3	4
15	15	3	1	1	6	1	5
16	15	3	0	1	12	6	18
17	14	4	1	1	10	1	16
18	14	3	1	1	17	1	14
19	15	4	1	1	3	1	9
20	14	4	1	1	19	4	7
21	15	1	1	1	9	3	10
22	15	3	0	1	2	3	8
23	15	4	1	1	21	4	12
24	14	1	1	1	2	4	7
25	15	4	1	1	8	4	6
26	14	3	0	1	15	1	8
27	15	4	1	1	6	2	12
28	16	3	0	1	7	9	30
29	15	2	1	1	2	2	6
30	15	4	1	1	1	3	5
31	14	3	0	1	12	6	17
32	17	4	0	1	17	20	7
33	15	4	1	1	3	2	10
34	15	3	0	1	3	4	7
35	15	3	0	1	2	4	5
36	17	3	0	1	2	2	6
37	15	3	0	1	6	4	6
38	15	4	1	1	7	6	10
39	15	3	0	1	3	2	8
40	13	3	1	1	8	4	22
41	13	2	0	1	7	1	3
42	17	4	0	1	1	4	9
43	15	3	0	1	6	5	7
44	15	4	0	1	1	2	11
45	14	0	0	1	6	5	8
46	15	0	0	1	11	7	22
47	15	1	0	1	15	10	7
48	13	1	0	1	7	5	8

Variables

Y = Housing conditions measured in points
X_1 = Income level (less than Shs. 400/- pm = 0, between shs. 400-800 = 1, between 801-1200 = 2, between 1201-1600 = 3, over Shs.1600 = 4)

House No.	Dependent Variable Y	Independent Variables					
		X_1	X_2	X_3	X_4	X_5	X_6
49	15	2	0	1	4	4	10
50	15	1	0	1	13	7	5
51	13	1	0	1	2	3	2
52	13	1	0	1	3	3	3
53	13	1	0	1	2	4	8
54	17	2	1	1	17	3	8
55	15	1	0	1	6	12	20
56	13	1	1	1	20	7	6
57	15	2	1	1	9	4	16
58	15	1	0	1	2	7	16
59	15	3	0	1	5	10	14
60	15	1	0	1	8	5	9
61	13	4	0	1	3	4	9
62	11	1	0	1	6	4	9
63	11	4	1	1	10	7	18
64	15	4	0	1	3	4	7
65	15	1	0	1	8	4	8
66	13	1	0	1	4	5	7
67	15	4	1	1	15	9	7
68	17	1	0	1	21	6	4
69	15	0	0	1	3	9	12
70	17	2	1	1	18	10	8
71	15	0	0	1	2	3	5
72	10	0	0	1	2	2	4
73	15	0	1	1	1	3	6
74	15	3	0	1	9	10	13
75	17	3	0	1	15	4	13
76	17	0	1	1	1	15	25
77	17	4	1	1	4	1	6
78	13	4	1	1	4	2	7
79	15	4	1	1	3	1	4
80	17	2	1	1	2	2	6
81	15	4	1	1	4	2	5
82	15	3	1	1	1	3	6
83	15	4	1	1	6	1	4
84	15	3	1	1	1	2	5
85	17	4	1	1	7	4	14
86	15	2	1	1	4	2	5
87	15	3	1	1	3	4	6
88	15	1	1	1	23	5	6
89	17	4	1	1	1	2	5
90	15	3	1	1	4	3	4
91	14	4	0	1	11	3	9
92	15	4	1	1	4	7	8
93	15	3	1	1	4	2	5
94	15	4	1	1	3	2	7
95	17	1	1	1	7	5	11

X_2 = Wall type (mud wattle cement = 0, blocks/bricks/stones = 1, mud wattle wall = 2)

X_3 = Roof type (thatch = 0, GCI/tiles = 1)

X_4 = Age of the building in years

X_5 = Number of buildings/houses in the homestead

X_6 = Household size.

House No.	Dependent Variable Y
96	17
97	17
98	10
99	17
100	15
101	8
102	12
103	8
104	10
105	10
106	12
107	10
108	9
109	10
110	10
111	4
112	11
113	12
114	8
115	10
116	13
117	9
118	12
119	10
120	10
121	10
122	12
123	10
124	10
125	15
126	13
127	10
128	11
129	12
130	8
131	10
132	10
133	13
134	9
135	12
136	13
137	13
138	14
139	11
140	13
141	7
142	8
143	11
144	13
145	11
146	13
147	15
148	11
149	13
150	4
151	8
152	9
153	9
154	14

X_1	X_2	X_3	X_4	X_5	X_6	House No.	Dependent Variable Y	X_1	X_2	X_3	X_4	X_5	X_6
4	1	1	4	2	6	155	12	4	2	0	2	2	6
4	1	1	1	2	9	156	12	4	2	0	7	3	5
4	0	1	18	1	4	157	13	4	2	1	4	3	3
1	1	1	4	5	10	158	15	0	2	1	3	2	2
0	1	1	10	3	5	159	10	0	2	0	12	2	2
1	2	0	2	2	9	160	11	0	2	0	5	3	4
0	2	0	5	3	7	161	10	0	2	0	2	3	3
0	2	0	10	3	10	162	11	0	2	1	4	2	2
1	2	0	3	1	5	163	10	0	2	0	2	2	3
0	2	0	7	2	4	164	13	0	2	1	7	4	7
3	2	0	3	2	6	165	9	0	2	0	5	5	7
1	2	0	14	2	10	166	7	0	2	0	6	1	2
0	2	0	9	3	4	167	6	0	2	0	15	1	2
1	2	0	19	6	4	168	11	0	2	0	2	2	3
0	2	0	10	5	3	170	12	0	2	0	2	3	3
0	2	0	8	2	2	171	11	1	1	1	5	4	10
0	2	0	1	3	5	172	10	4	2	1	23	4	6
0	2	0	5	3	5	173	11	0	2	0	3	3	2
1	2	0	6	3	3	174	13	0	2	0	3	3	4
0	2	0	1	1	5	175	12	1	2	0	7	6	7
0	2	0	1	3	7	176	13	1	2	1	10	4	9
0	2	0	4	4	7	177	13	1	2	0	4	2	7
0	2	0	1	3	6	178	12	1	2	0	9	3	5
0	2	0	4	4	7	179	13	4	2	1	5	1	4
1	2	0	6	2	6	180	10	1	2	0	13	2	2
0	2	0	10	2	3	181	8	0	2	0	14	3	5
1	2	0	3	2	7	182	8	0	2	0	13	4	8
0	2	1	2	7	9	183	15	2	2	0	12	4	7
2	2	0	2	1	2	184	15	0	2	1	6	2	10
3	2	1	10	2	8	185	6	0	2	0	2	2	5
3	0	1	10	7	13	187	13	0	2	0	7	5	3
4	2	0	6	1	4	188	1	0	2	0	8	1	4
0	2	0	1	4	2	189	9	3	2	0	4	3	8
1	2	0	3	3	8	190	12	1	2	0	13	3	4
3	2	0	8	2	8	191	13	0	2	0	2	3	3
3	2	0	1	3	11	192	9	0	2	0	8	2	3
2	2	0	1	1	3	193	7	0	2	0	10	3	3
3	2	0	20	2	2	194	15	1	2	1	7	3	3
3	2	0	9	2	6	195	12	0	2	0	2	3	5
1	2	1	9	6	8	196	12	1	2	0	3	2	9
3	2	0	14	4	6	197	8	0	2	0	1	1	3
3	2	0	3	2	4	198	13	0	2	0	12	4	2
1	2	0	8	7	13	199	13	4	2	1	14	5	5
3	0	1	15	3	10	200	10	0	2	1	9	2	3
0	2	0	4	8	10	201	9	0	2	0	16	3	5
1	2	0	18	3	2	202	10	0	2	0	1	3	4
2	2	0	14	2	8	203	13	0	2	0	7	3	4
1	2	0	4	2	4	204	8	0	2	0	6	1	8
0	2	1	4	9	20	205	11	1	2	0	1	4	3
1	2	0	12	5	5	206	15	1	2	0	16	3	2
1	2	0	3	5	7	207	13	0	2	0	8	2	2
1	2	1	10	2	5	208	13	0	2	0	12	2	2
1	2	1	7	3	4	209	10	0	2	0	18	4	13
1	2	0	2	3	12	210	10	0	2	0	5	3	5
2	2	0	4	1	4	211	13	0	2	1	3	3	3
1	2	0	4	6	6	212	4	0	2	0	9	1	2
1	2	0	23	5	11	213	5	0	2	0	8	2	5
1	2	0	11	2	4	214	11	0	2	0	20	3	4
2	2	0	4	5	17	215	4	0	2	0	3	1	7

House No.	Dependent Variable Y
216	7
217	11
218	11
219	10
220	5
221	11
222	13
223	10
224	10
225	9
226	2
227	15
228	13
229	13
230	15
231	15
232	11
233	12
234	4
235	3
236	9
237	15
238	11
239	11
240	11
241	11
242	11
243	10
244	4
245	5
246	0
247	13
248	6
249	3
250	6
251	9
252	5
253	5
254	11
255	12
256	7
257	1
258	4
259	14
260	7
261	6
262	13
263	9
264	2
265	14
266	1
267	7
268	11
269	4
270	10
271	8
272	2
273	5
274	8

X₁	X₂	X₃	X₄	X₅	X₆	House No.	Dependent Variable Y	X₁	X₂	X₃	X₄	X₅	X₆
0	2	0	5	3	4	275	9	0	2	0	6	2	6
0	2	0	2	4	7	276	8	1	2	0	6	2	7
0	2	0	3	3	6	277	13	1	2	0	2	3	5
0	2	1	2	2	2	278	13	0	2	1	3	2	5
0	2	0	10	3	6	279	11	0	2	1	15	3	4
0	2	0	10	3	2	280	3	0	2	0	6	2	2
0	2	0	10	6	11	281	0	0	2	0	15	3	7
0	2	0	10	4	5	282	7	0	2	0	10	8	13
0	2	0	3	5	10	283	12	0	2	0	2	5	9
0	2	0	7	2	3	284	3	0	2	1	5	2	5
0	2	0	13	1	2	285	8	1	2	1	11	8	25
3	0	1	6	6	6	286	10	0	2	0	5	3	5
2	2	0	5	3	8	287	9	0	2	0	3	6	9
0	2	1	5	6	8	288	2	0	2	0	20	2	8
2	2	0	8	2	8	289	6	1	2	0	2	1	2
2	2	1	13	7	13	290	13	1	0	1	2	6	6
0	2	1	2	4	6	291	7	0	2	0	2	3	9
2	2	0	14	3	10	292	13	1	0	1	3	8	5
2	2	0	25	5	14	293	8	2	2	0	16	5	8
0	2	0	16	2	5	294	5	0	2	0	3	1	3
1	2	0	5	3	2	295	7	0	2	0	17	2	5
4	2	0	2	2	3	296	10	1	0	1	7	4	20
4	2	0	16	3	7	297	9	0	2	0	2	5	14
3	2	0	6	2	4	298	13	4	0	1	1	11	13
4	1	1	4	1	5	299	7	0	2	0	3	3	4
1	2	0	14	6	13	300	13	0	2	0	3	5	5
0	2	0	1	3	9	301	12	1	2	1	7	3	11
1	2	0	9	1	3	302	7	0	2	0	1	5	10
0	2	0	18	2	2	303	7	0	2	0	4	2	3
0	2	0	3	4	7	304	13	0	0	1	1	6	16
0	2	0	8	1	2	305	2	0	2	0	3	1	8
1	2	1	3	6	4	306	7	0	2	0	5	3	7
1	2	0	7	2	9	307	7	0	2	0	3	3	8
0	2	0	3	4	11	308	9	1	2	1	22	2	27
0	2	0	30	5	5	309	7	0	2	0	8	6	6
0	2	1	1	5	4	310	13	0	2	0	8	3	2
0	2	0	7	5	10	311	7	0	2	0	6	5	2
1	2	0	2	1	8	312	7	0	2	0	2	3	4
0	2	1	3	7	6	314	7	0	2	0	2	2	2
0	2	1	15	15	10	315	7	0	2	0	13	5	37
0	2	0	3	4	4	316	10	0	2	0	4	1	7
0	2	0	3	2	3	317	7	0	2	0	8	4	6
0	2	0	6	2	8	318	5	0	2	0	11	2	7
0	2	1	5	5	4	319	7	0	2	0	9	3	8
0	2	1	10	2	3	320	11	2	2	0	4	2	12
1	2	0	2	3	8	321	8	3	2	0	4	3	9
0	2	0	11	2	3	322	8	4	2	0	7	3	5
2	2	1	1	3	13	323	13	4	2	1	2	2	10
0	2	0	14	2	2	324	9	3	2	0	3	5	2
1	2	1	6	6	18	325	10	2	2	0	3	5	2
0	2	0	14	3	8	326	8	4	2	0	10	14	5
0	2	0	6	3	3	327	13	2	2	1	2	4	4
0	0	1	4	6	4	328	12	3	2	0	3	4	2
0	2	0	8	2	3	329	11	3	2	0	3	10	11
1	2	0	1	2	8	330	13	4	2	1	5	3	18
0	2	0	10	5	10	331	12	4	2	0	4	7	5
1	2	0	9	4	7	332	11	3	2	0	3	2	6
0	2	0	7	5	6	333	11	2	2	0	4	10	4
0	2	0	4	3	8	334	10	4	2	0	7	8	2

House No.	Dependent Variables Y	X_1	X_2	X_3	X_4	X_5	X_6
335	11	2	2	0	2	12	3
336	11	4	2	0	8	9	5
337	14	4	2	1	3	6	6
338	9	4	2	0	5	3	9
339	15	3	2	0	4	6	4
340	11	3	2	0	4	5	4
341	13	4	2	0	3	2	5
342	9	3	2	0	3	2	6
343	13	3	2	0	5	2	4
344	15	2	2	0	11	2	6
345	9	2	2	0	5	4	7
346	7	2	2	0	6	2	3
347	11	2	2	0	10	7	3
348	11	3	2	1	4	6	15
349	13	3	2	0	2	5	5
350	14	2	2	0	2	6	3
351	13	2	2	0	7	10	4
352	13	3	2	1	4	4	5
353	13	3	2	0	5	3	7
354	8	3	2	0	14	4	10
355	11	2	2	0	6	1	3
356	12	2	2	0	2	2	2
357	15	3	2	1	5	2	5
358	6	2	2	0	10	3	4
359	11	2	2	0	25	3	4
360	15	4	2	1	3	3	5
361	12	4	2	0	8	4	10
362	8	2	2	0	4	2	3
363	9	2	2	0	6	3	3
364	13	4	2	0	10	4	10
365	12	3	2	0	8	2	7
366	9	2	2	0	4	4	6
367	9	1	2	0	10	3	6
368	7	0	2	0	4	2	8
369	13	2	2	0	3	2	3
370	10	4	2	0	2	1	5
371	10	4	2	0	2	3	10
372	11	1	2	1	2	2	9
373	6	0	2	0	2	1	4
374	15	4	2	1	15	8	19
375	6	2	2	0	7	2	6
376	10	1	2	1	5	4	14
377	8	1	2	0	8	4	5
378	7	1	2	0	2	2	10
379	13	3	0	1	7	6	9
380	13	2	2	1	4	3	17
381	7	2	2	0	2	4	9
382	11	2	2	1	3	3	20
383	10	2	2	0	5	4	6
384	12	2	2	1	5	11	15
385	13	3	2	1	11	5	22
386	6	0	2	0	3	3	2
387	13	3	2	1	4	2	6
388	15	0	2	0	3	3	11
389	12	4	2	1	3	3	5
390	13	4	2	1	4	4	6
391	12	2	2	0	5	7	2
392	13	4	2	0	4	2	4
393	17	3	2	1	5	3	5
396	10	3	2	0	4	6	11
397	9	0	2	0	5	3	5

House No.	Dependent Variables Y	X_1	X_2	X_3	X_4	X_5	X_6
			Independent Variables				
398	15	3	0	1	8	3	6
399	13	2	2	0	2	4	3
400	10	1	2	0	12	8	4
401	11	4	2	1	4	4	7
402	13	3	2	0	4	5	11
403	13	4	2	0	2	2	5
404	12	0	2	0	4	2	4
405	12	1	2	0	4	3	8
406	17	3	2	0	3	2	4
407	13	1	0	1	3	5	7
408	15	2	2	1	7	3	6
409	12	0	2	0	18	4	8
410	9	0	2	0	15	3	4
411	8	2	2	0	6	1	7
412	9	2	2	0	8	2	5
413	9	1	2	0	5	3	2
414	8	0	2	0	12	3	7
415	12	0	2	0	3	2	4
416	13	0	2	0	3	2	4
417	13	0	2	0	2	2	3
418	15	4	0	1	9	10	10
419	15	0	2	0	5	4	9
420	12	1	2	0	2	4	4
421	5	0	2	0	18	4	10
422	13	0	2	0	8	2	6
423	15	0	2	0	1	7	8
424	10	0	2	0	10	5	6
425	12	0	2	0	17	2	10
426	6	0	2	0	5	1	4
427	13	1	2	0	3	7	8
428	13	0	2	1	12	5	12
429	10	1	2	0	10	2	3
430	13	0	2	0	6	6	10
431	8	0	2	0	10	4	9
432	13	0	2	1	5	2	8
433	10	0	2	0	6	3	4
434	9	1	2	0	5	4	6
435	8	0	2	0	4	3	6
436	8	1	2	0	8	3	5
437	13	0	2	0	4	3	5
438	12	3	2	1	3	4	11
439	12	0	2	0	33	5	6
440	15	1	2	0	5	5	6
441	15	1	2	0	3	3	5
442	14	1	2	0	6	2	3
443	15	1	2	1	3	4	7
444	8	0	2	0	5	4	6
445	8	0	2	0	9	5	11
446	9	0	2	0	5	3	5
447	13	0	2	0	2	4	5
448	13	0	2	0	3	5	7
449	15	2	2	0	4	3	8
450	13	1	2	1	5	6	6
451	15	2	2	0	2	7	9
452	7	1	2	0	6	3	6
453	15	0	2	1	5	6	10
454	15	0	2	1	29	2	7
455	13	0	2	1	8	7	7
456	13	0	2	0	3	8	6
457	9	0	2	0	15	2	8
458	11	0	2	0	5	3	2

House No.	Dependent Variable Y	Independent Variables						House No.
		X_1	X_2	X_3	X_4	X_5	X_6	
459	9	0	2	0	7	3	7	
460	13	0	2	0	4	3	5	
461	13	0	2	0	3	4	7	
462	11	0	2	0	3	2	6	
463	15	1	2	0	2	2	6	
464	13	1	2	0	17	3	8	
465	15	3	2	1	3	2	5	
466	11	0	2	0	5	2	4	
467	11	3	2	0	6	4	7	
468	9	0	2	0	6	6	3	
469	10	1	2	0	4	8	5	
470	15	4	2	0	2	3	4	
471	12	0	2	1	6	5	8	
472	12	1	2	0	6	2	4	
473	12	3	0	1	18	4	4	
474	13	0	2	0	3	3	5	
475	7	0	2	0	7	3	7	
476	10	0	2	0	5	2	3	
477	12	0	2	0	10	6	6	
478	13	1	2	0	5	5	5	
479	8	0	2	0	6	3	5	
480	9	1	2	0	6	8	10	
481	8	0	2	0	12	3	5	
482	13	1	2	0	8	4	7	
483	6	0	2	0	3	2	5	
484	11	0	2	0	4	6	6	
485	12	0	0	1	11	2	6	
486	13	0	2	0	3	2	8	
487	13	1	2	0	7	7	7	
488	10	2	2	0	6	3	7	
489	11	2	2	0	7	6	7	
490	10	0	2	0	2	3	4	
491	13	2	2	1	1	3	4	
492	11	0	2	0	2	7	5	
493	15	0	2	0	1	3	6	
494	7	0	2	0	6	2	4	
495	5	1	2	0	9	3	7	
496	6	0	2	0	9	3	7	
497	12	0	2	0	1	4	9	
498	13	0	2	0	12	5	7	
499	12	0	2	0	10	5	5	
500	15	1	2	0	2	4	6	
9	14	4	1	1	15	2	9	
169	10	0	2	0	3	1	8	
186	13	0	2	1	4	3	5	
313	10	0	2	0	20	8	9	
394	14	2	2	0	3	2	6	
395	14	4	2	0	2	5	7	

Dependent Variable Y	X_1	Independent Variables				
		X_2	X_3	X_4	X_5	X_6

FINAL MULTIPLE REGRESSION MODEL FOR SIAYA

FILE   NONAME   (CREATION DATE = 18/02/86)

* * * * * * * * * * * * * * * * * * MULTIPLE REGRESSION *   VARIABLE LIST   1

REGRESSION LIST   1

DEPENDENT VARIABLE..   Y   HOUSING CONDITIONS IN PTS.

SUMMARY TABLE

VARIABLE		MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
X4	THATCH	0.55348	0.30634	0.30634	-0.55348	-2.26179	-0.31639
INCOME		0.60537	0.36648	0.06014	0.44130	0.00144	0.22773
X5	HOUSESTEAD BUILDINGS	0.62075	0.38533	0.01885	0.23882	0.25943	0.17783
X4	AGE OF HOUSE IN YRS.	0.63482	0.40300	0.01767	-0.11909	-0.05374	-0.13585
X3	MUDWTC	0.64665	0.41816	0.01516	-0.51916	-2.04307	-0.25261
X1	MUDWTCEM	0.65030	0.42289	0.00473	0.31772	-1.00027	-0.09733
X6	HOUSE HOLD SIZE	0.65196	0.42506	0.00217	0.16059	-0.04034	-0.05216
(CONSTANT)						15.22567	

FILE   NONAME   (CREATION DATE = 18/02/86)

* MULTIPLE REGRESSION *
* * * * *

ICL 1900 IMPLEMENTATION - RELEASE 3 --- PROGRAMME THAT WAS FED INTO THE COMPUTER.

THIS VERSION IS DESIGNED TO SAVE PAPER. A NEW CONTROL CARD, 'PAGING STANDARD', IS AVAILABLE IF REQUIRED.

```
RUN NAME            HOUSING PROJECT
VARIABLE LIST       Y,X1 TO X6
INPUT MEDIUM        CARD
\ OF CASES          300
INPUT FORMAT        FREEFIELD
VAR LABELS          Y HOUSING CONDITIONS IN PTS./
                    X1 INCOME LEVEL/
                    X2 WALL TYPE/
                    X3 ROOF TYPE/
                    X4 AGE OF HOUSE IN YRS./
                    X5 HOUSESTEAD BUILDINGS/
                    X6 HOUSEHOLD SIZE/
VALUE LABELS        X1 (0) LESS THAN SH.400 PM
                    (1) SH. 400-800
                    (2) SH. 801-1200 PM
                    (3) SH. 1201-1600 PM
                    (4) GRT 1600 PM/
                    X2 (0) MUD-WATTLE-CEMENT-SCREENED SURF =
                    (1) BLOCKS-STONES-BRICKS
                    (2) MUD-WATTLE /
                    X3 (0) THATCH
                    (1) CORRUGATED IRCH-TILES/
COMPUTE             D1=0
COMPUTE             D2=0
COMPUTE             D3=0
COMPUTE             D4=0
COMPUTE             D5=0
IF                  (X1 EQ 0) INCOME=200
IF                  (X1 EQ 1) INCOME=600
IF                  (X1 EQ 2) INCOME=1000
IF                  (X1 EQ 3) INCOME=1400
IF                  (X1 EQ 4) INCOME=1600
ASSIGN MISSING      INCOME(9999)/
IF                  (X2 EQ 0) D1=1
IF                  (X2 EQ 1) D2=1
IF                  (X2 EQ 2) D3=1
ASSIGN MISSING      D1 TO D5(9)/
IF                  (X3 EQ 0) D4=1
IF                  (X3 EQ 1) D5=1
ASSIGN MISSING      D4 TO D5(9)/
VAR LABELS          D1 'BLOCKTCEM'
                    D4 'THATCH' / D5 'CORRCTED'/ D3 'BLOCKED'/ D5 'MUDWTL/
VALUE LABELS        D1 TO D5(0) NO (1) YES/
REGRESSION          VARIABLES = Y TO X6,INCOME D1 TO D5/
                    REGRESSION = Y WITH INCOME,X4,X5,X6,D1 TO D5 (1) RESID=0/
OPTIONS             2
STATISTICS          ALL
READ INPUT DATA
/
```