FACTORS INFLUENCING THE CHANGING URBAN LAND USE PATTERNS IN MBALE MUNICIPALITY SINCE 1995

BY

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DECLARATION

I GESA ALI, hereby declare to the best of my knowledge that this work is original and has never been presented in any university for the award of a degree or similar award.

Signature .....

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DEDICATION

This research report is dedicated to my late parents namely Hajji Adam Mwigo, Nabukonde Halima, my daughter Gonza Nandudu Mariam and my wife Kabahuma Nashiba for their care, love, and patience given to me ever since the beginning of my academic journey .

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LIST OF ACRONYMS AND ABBREVIATIONS

NEMA-	National Environmental Management Authority
UBOS-	Uganda Bureau of Statistics
NGOS-	Non Governmental Organizations.
CBD-	Central Business District
LC-	Local Council
MMC-	Mbale Municipal council
MM-	Mbale Municipality
NFA-	National Forestry Authority
UNRA-	Uganda National Road Authority
US-	United States
LTD-	Limited
KCB-	Kenya Commercial Bank
et al-	and others
BCU-	Bugisu Co-operative Union
IU.IU-	Islamic University in Uganda
AIDS-	Acquired Immune Deficiency Syndrome
NARO-	National Agricultural Research Organization
UNEP-	United Nations Environmental Program
PBUH-	Peace Be Upon Him

ABSTRACT

This study focused on the factors influencing the changing Urban land use patterns in Mbale Municipality since 1995. There were three main objectives set in the study, that is, to describe the previous and current land use patterns in Mbale Municipality since 1995, to examine the underlying causes and effects of the changing urban land use patterns in Mbale Municipality since 1995, and to establish the relationship between urban land uses and Mbale urban structure plans or schemes for 1954 and 1997. Purposive sampling method was used to arrive at the samples for the study. A population of study was selected. They included business community (commercials), homesteads, industrialists and planners. Observation, questionnaires and interviews guides were the major research instruments used. Observation was used especially on observing the current land use changes. Questionnaires and interview guides were administered to collect data from the sampled categories of people in Mbale Municipality. Documentary review was used to supplement on primary data obtained from interviews and questionnaires. The data was analyzed using frequency distribution, percentages, Tables, pie charts, graphs, maps and photographs. Previously, before 1995 low lying areas and valleys were reserved for conservation and public open spaces. Gently sloping areas were mainly for residential, administrative, institutional and commercial purposes. Currently after 1995, land uses have been mixed up in all the three divisions. You find both residential and commercial activities taking place in areas meant for industrial or conservation area. The changes in land use patterns in Mbale municipality have been influenced by mainly socio-economic factors. The effects resulting from the changing urban land use patterns are diverse which included the following: Destruction of wetland areas, encroachment on open spaces, urban farm land and land use conflicts among others. A comparison of the changes in land use patterns in Mbale municipality are not in line with the Mbale urban structure plans/schemes of 1954 and 1997. It was recommended that stakeholders devise measures such as implementing land use regulations among other measures to ensure proper growth of the town as it processes for a city status.

CHAPTER ONE

INTRODUCTION

1 Background to the study

Land use refers to the activities carried out on the land at a particular period of time in a given area. According to UNEP (2008), land use is the social and economic purposes for which land (or water) is managed such as grazing, timber extraction, conservation, irrigation and farming. Urban land use is planned according to the physical characteristics of the land and its capability to support the activities set up in a given urban centre or town at a particular period of time.

In the views of Enger and Smith (2004), land use planning is the construction of an orderly list of priorities for the use of available land, and its implementation to bring about desired land uses. In urban areas, land use planning ensures that the available land is used in relation to the physical characteristics of the land.

Vestappen (1983) states that, the general characteristics of the urban structure reflects the availability of flat or gently sloping land. Enger and Smith (2004) assert that, land use planning determines the nature of land use types, patterns, forms, control of urbanization and allocation of urban land as a resource for economic and social development. Land use planning in urban areas is therefore, aimed at provision of easy access to social and economic services. Lack of land use planning can result into a crisis as it is common in slums of most urban centres where inaccessibility and unhygienic conditions are observed. For example NEMA (2009) points out that; unplanned settlements at Nakawa suburb in Kampala city are difficult to access in event of an emergency.

Williams e tal (1994) pointed out that, the challenge in third world cities now is to move towards cities and towns which are based on sound ecological principles, that minimize intrusion into the natural environment, by taking account of topographic, hydrological, vegetational and climatic conditions. Stren (1994) while commenting on urban research in Eastern Africa in the 1990s further pointed out that in addition to the basic research questions posed in the previous decades during the 1970s, attention was also directed towards seeking solutions for what was already seen to be distorted urban growth.

According to Mbale structure plans/ schemes of 1954 and 1997, Mbale town like other towns in Uganda, land was planned and land uses /activities were allocated to certain areas basing on the physical characteristics of the land or land capability. For example, residential, administrative and commercial activities were allocated in gently and moderately slopping areas. Industrial activities were allocated in flat and low lying areas which are well drained. Valleys and very low lying areas were reserved for public open spaces. Low lying areas which were poorly drained were reserved for wetlands and forests. Steep slopes were reserved for recreational purposes.

For instance areas which were originally meant for residential are being used for commercial, recreational and as administrative centres. The centre of the town or municipality which was meant for commercial is now being used for financial and communication networks, areas which were reserved for public open spaces are now being used for settlements and farming. Areas which were reserved as wetlands and forest reserves have been encroached upon for industrial and residential settlements. The changes in land use patterns in Mbale municipality are not according to the original structure plans or schemes of 1954 and 1997 which had taken into consideration the environment and physical characteristics of the land. Therefore, in light of the above, the purpose of this research was to establish the factors that have influenced the changing urban land use patterns in Mbale Municipality since 1995 and to make recommendations for the future orderly growth of Mbale town.

1.1 Statement of the problem

Mbale municipality urban land was planned following the Mbale structure plans or schemes of 1954 and 1997. It was planned in such a way that lowlands were for industrial activity and public open spaces. Gentle slopes for commercial and residential purposes and low land areas which are poorly drained were reserved for conservation. However, the deviation from the original structure plans where urban land uses were planned and activities allocated according to the physical characteristics of the land, and their capability to support certain land use types has caused concern and hence leading to land use conflicts. As residential, commercial, recreational, agricultural, institutional, industrial and conservation land uses compete for the available land. There results a general mix up of the land use zones. For example David .M in the daily monitor newspaper of Friday 18th September 2009 on page 7 reported that the land meant for recreation (sports club) was being taken over by National Forestry Authority to plant trees. Daniel.E in the New Vision of Thursday 9th December 2010 on page 28 reported that, Uganda National Road Authority has condemned part of the storey building under construction at Mbale Bus Park in Industrial division at the roundabout along Mbale-Tororo high way erected in a road reserve.

UNRA demanded for its demolition to avoid conflict with the Road Authority. Therefore, the above controversy calls for the need to study the underlying factors influencing the changing urban land uses in order to make recommendations for future orderly growth of land use patterns in Mbale municipality.

1.2 Objectives/Aims of the study

The general objective of the study was:

- To establish the factors which have influenced the changing urban land use patterns in Mbale municipality since 1995.

1.2.1 Specific Objectives

The Specific objectives of the study were to:

I. Describe the previous and current land use patterns in Mbale Municipality since 1995
II. Examine the underlying causes and effects of the changing urban land use patterns in Mbale Municipality since 1995
III. Establish the relationship between the current urban land uses and Mbale Urban Structure plans or schemes of 1954 and 1997.

1.3 Research Questions

The research questions were:

i) What are the previous and current land use patterns in Mbale municipality since 1995?

ii) What are the underlying causes and effects of the changing urban land use patterns in Mbale municipality since 1995?

iii) To what extent are the urban land use patterns in Mbale municipality related to Mbale urban structure plans / schemes of 1954 and 1997?

1.4 Significance of the study

The study aims at giving a general insight on the changing urban land use patterns in Mbale municipality and their effects on the development of the town and the physical environment. Overall, the study is to provide the required baseline study of Mbale municipal council in order to avail town planners in the region with the necessary data to improve on the structure plan of the town and the general public who are responsible for its expansion to know about the effects of land use changes.

1.5 Scope of the study

The study was confined to Mbale Municipality (town) covering the three divisions of Industrial, Wanale and Northern so as to get the overall view of the changing urban land use patterns in the

whole municipality. The study focused mainly on the residents of Mbale municipality covering the total population of 86,200 residents as per the housing and population census of 2002. The study covered a period between 1995- 2012. The year 1995 was the year when land use changes started to occur in Mbale Municipality. The study focused on the factors that have led to the changing urban land use patterns in the three divisions since 1995 and the resultant effects on the development of the town and the physical environment.

1.6 Limitations of the study

In carrying out this study, the following were the limitations encountered:

- Geographical coverage of the area of study was a limitation. Mbale Municipality which was the study area consists of three divisions of Wanale, Northern and Industrial. Moving to all the three divisions to collect data was tiresome and costly. However, research assistants were appointed in every division to assist in data collection.
- Time framework was a limitation. The course was to take a minimum of two years and maximum of five years. However, the researcher tried to complete this research work within the stated time frame work.
- Suspicion, distrust and lack of co-operation from the respondents were other limitations. The people in the area viewed the study as an attempt of the municipal council authorities to evict them from their land especially in slum areas. Therefore, there was fear and some respondents were unwilling to give all the necessary information. However, through cooperation with local leaders in the area and respondents the researcher was able to get the necessary information. The researcher further assured the respondents that the study was for academic purpose

1.7 Definition of Terms

Land use

This refers to the activities being carried out on the land in the area such as residential, commercial, industrial, transport and communication, recreational among others.

Land use patterns

This refers to the arrangement of land uses (activities) in the area/specification of forms/categories of land use. For example residential areas, display different land use patterns depending on the type of architecture of the buildings reflecting different periods of settlement.

Land use planning

This refers to the allocation of land uses (Activities) on the land in the area best suited for them following the structure plans or schemes of 1954 and 1997. Allocation of land to various land use types leads to zoning of urban land uses.

Land characteristics

This refers to the relief/topography of the area like gentle slopes, flat land/low land or valley.

Land capability

This refers to the ability of the land in the area to support the land uses (activities) that have been set up in relation to the physical characteristics of land basing on the nature of the land/quality.

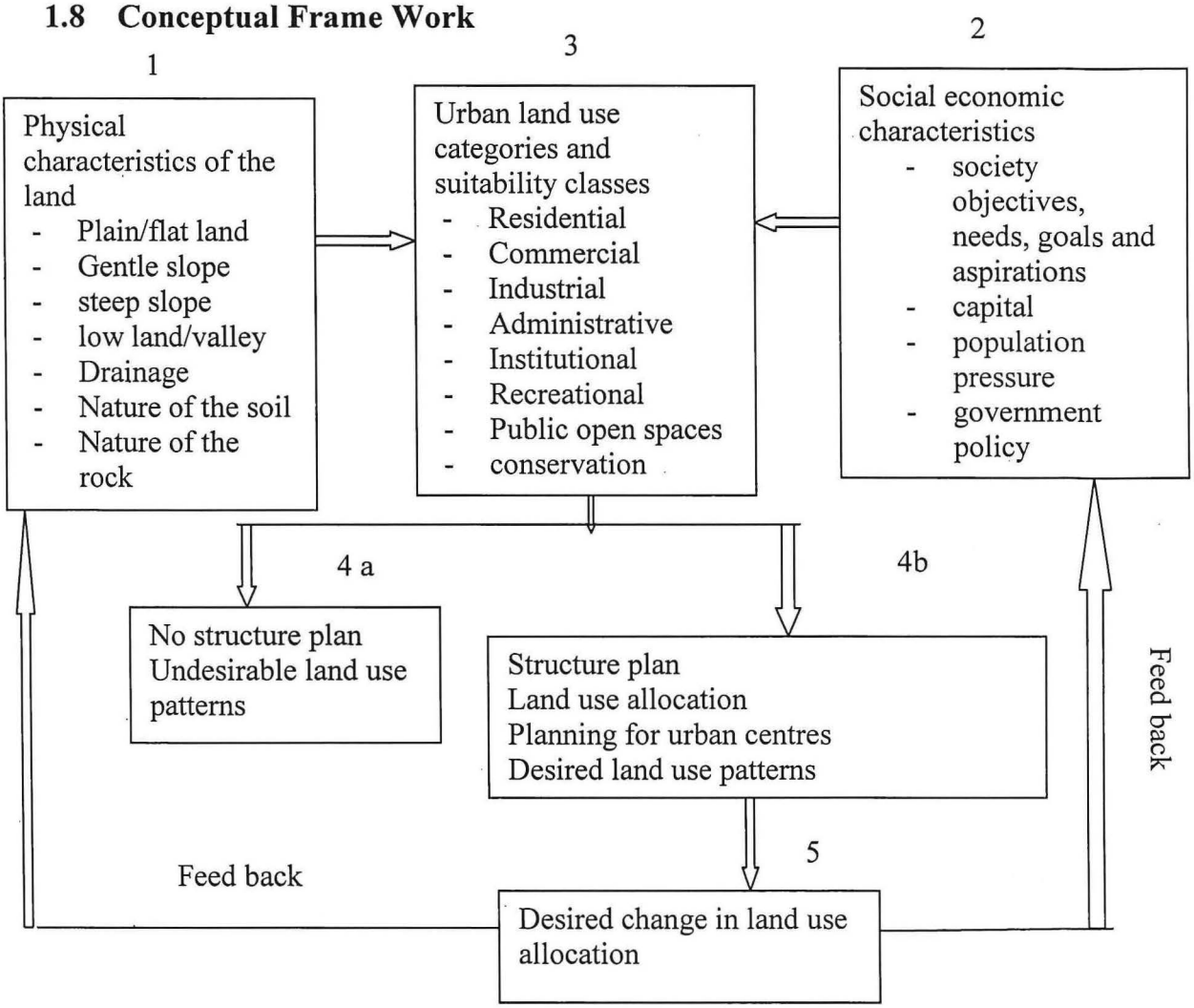
Municipality

This refers to an urban centre or town that has attained the legal urban hierarchy next to a city or it refers to a town with its own local government in provision of services like water, rubbish collection among others.

Orderly growth

This refers to the proper allocation of land uses (activities) following the structure plans or schemes of 1954 and 1997.

1.8 Conceptual Frame Work



Physical characteristics of the land (1) and socio-economic characteristics (2) determine allocation of urban land use categories (3). This results into un desirable land use patterns if there is no structure plan(4a), this therefore calls for a structure plan for proper allocation of urban land uses to be put in place (4b) this leads to desired change in land use allocation (5). (4a) people may choose to ignore planned land uses, (4b) people may desire orderly settlements .i.e. designing and implementation of structure plans

CHAPTER TWO

LITERATURE REVIEW

2 Introduction

In this chapter, an attempt was made to review the relevant literature available on the topic (factors influencing the changing urban land use patterns in Mbale municipality since 1995). The literature under review was organized according to the following sub headings: The nature of urban land use patterns in urban areas; Causes and effects of the changing urban land uses in urban centres; and the role of structure plans/schemes in urban development.

2.1 The Nature of land use patterns in urban areas

Urban land uses have evolved commonly recognized patterns the world over and models have been developed to interpret these patterns. Chorley and Haggaett (1967) defined a model as a theory, hypothesis, law or principle, an expression which can be mathematical containing knowledge of truth or reality about the real world. The study of urban land use patterns has generally been drawn from different descriptive models. These models were developed to describe the patterns of urban land use in early industrial cities of the U.S and can equally apply to the cities of the third world. Because the shape and form of American cities changed over overtime new models of urban land use were developed to describe an urban landscape that was becoming increasingly complex and different. Furthermore, because these general models were devised to understand the overall patterns of land use, none of them can accurately describe patterns of urban land use in all cities. Surely all these models have been blamed for being applicable to cities in the U.S than cities of other nations. These models however, have limitations like being static, describe patterns of urban land use in a generic city but do not describe how land use patterns change. Below is an examination of these models of urban land use.

David Payne and Sue Jennings (2001) assert that, rapidly growing cities in less developed countries develop different land use patterns to cities in most developed countries, which have grown more slowly, often over hundreds of years. The Central Business District (CBD) is the commercial centre where most of the city's business activities take place. Factories, businesses and expensive apartment blocks may develop along main roads out of the cities. The real poor shanty town areas tend to be on the edge of the city or along the main roads rather than near the centre where poor housing is found in many most developed cities. Dickenson et al (1983) while commenting on the urban social structure of housing in third world cities pointed out that,

traditionally, the small pre-industrial elite, whether in Guatemala City or Istanbul lived in houses adjacent to the centre, whereas persons of low status were confined to the edge of the city. This declining social gradient from the centre to periphery is still observable in many small third world towns.

Morgan (1982) further asserts that the central business district which represents the original site of the town, is surrounded by industrial and residential zones, industrial zones are related to major roads and railways and between them are low class residential areas. The residential zones further from the centre are middle class housing. Digby et-al (1996) further points out that, models are theoretical land use patterns and they simplify the real world. The Hoyt sector model (1939) and the Harris and Ullman multiple nuclei model (1945) both show alternative patterns of land use to those suggested by Burgess. All the three models show a segregation of land uses. For example Kampala city seems to follow the multiple-nuclei model as reported by NEMA (2009); the Kampala suburbs are also experiencing rapid urbanization leading to development of satellite towns around the city. Current trends indicate that, these satellite towns may be merged into present Kampala to form the metropolitan Kampala and towns likely to be absorbed include: Mukono, Entebbe, Wakiso, Kira, Namugoona, Bweyogerere and Kyengera among others.

These views are in line with those of Savage (1993) that a variety of models of segregation were advanced , each of which hypothesizes a typical pattern for the distribution of major urban activities. The Chicago school model identified zones, radiating out from the center of cities, each with its own specialized activities. Sectoral pattern, with concentration of activities in wedged–shaped corridors emanating from the middle. The third model accepts that there are concentrations of activities in particular spatial areas, but there is no regular pattern, with clusters of specialized activity spread around the city.

In agreement with the above there are also urban land use theories and the land value rent theory which is the equivalence of Von Thuneen as quoted by Waugh (2000), in a free market the highest bidder obtains the use of land. In towns/ municipalities, competition for land use is highest in the city centre due to accessibility and shortage of space. Supermarkets, banks and telecommunication centers dominate the municipality centre, and Non- governmental organizations have occupied the residential houses as offices. This is because they can afford to pay high rents. The surrounding areas are less priced and densely populated like outskirts of municipalities.

NEMA (2009) points out that, land use in Ugandan urban centres is mixed throughout the districts consisting of the built-up area, agricultural land, and conservation area. There are initially three broad land use categories; agricultural land, built-up areas and those reserved for conservation. However, these land use categories are not entirely exclusive of one another and therefore interrelated. Muhwezi (1995) argued that, a general look at Kampala city and its immediate surroundings brings out three major land use categories which include: urban and built-up land, referring to all land containing urban developments like residential, commercial, institutional, recreational and other developments. Non-urbanized and none built -up land; referring to all urban land containing non-urbanized developments especially agricultural and forest land. Open water and wetlands; referring to all areas covered by open water or swamps. The same Pattern of land use in Kampala is not different from that of other subsequent towns in Uganda such as Jinja in Eastern Uganda, Masaka and Mubende in Central Uganda, Mbarara and Kabale in South Western Uganda, Fort Portal in Western Uganda and Gulu in Northern Uganda among others.

In addition to the above urban growth and development theories, there are other theories of urban growth and development such as modernization theory, urban based theory, and Keynesian theory which explains growth and development of urban centres in economic and monetary terms explaining the distribution of goods and services like hospitals, police stations, transport terminals, education institutions, cultural and religious centres that are planned basing on land quality of a given urban centre hence influencing land use patterns (Balchin et al 2000). This is true in some towns/municipalities where the decline or increase in economic activities like mining, industrialization, trade and commerce among others can either lower or increase the demand for services thereby retarding the growth and development or leading to growth and development of towns respectively. This has a direct influence on land use patterns.

2.2 Causes and effects of the changing land uses and land use patterns in urban centres

Changing land uses and patterns have a number of causes and effects. These causes and effects have been written about by different scholars. Balchin et al(2000) argue that, past and present social, religious customs, legislation and legal decisions, demand for goods and services, and policy of local and central government in the supply of public utilities and social services affect land use patterns. David and Sue (2002) state that, as squatter settlements grow they can become communities organized with residents' associations. Electricity may come by taping into over head lines or by putting pressure on the authorities to put in a basic infrastructure. Small bars, shops and other facilities develop, and with enough local support schools may be set in someone's

house or in a small local building. These variations provide different frameworks within which competition between the existing and potential land users decides the patterns of land use in any urban area. This is in line with Badcock (2002), political forces in form of government decisions especially to provide public utilities influence change in land use patterns.

Jose and Tamara (2007) assert that, government policy of industrialization has further contributed to deforestation through degazzettment of forests to create industrial parks. These include forests such as Namanve near Kampala city. This growth in industry has a likely impact on land use patterns as it will result into establishment of shanty settlements, commercial centres, and recreational facilities among others. These in a long run affect land use patterns. The expansion of urban centres and industrial development has therefore resulted into permanent loss of sizable portion of the forest site. The loss however concerns plantation forests and attempts are being made to replace them by planting alternative sites. This change in opinion has accelerated the demand for land, hence encroaching on marginal lands. Important to note is that accelerated demand for land has led to stiff competition to acquire land and consequently influencing land use patterns.

In Uganda the Daily Monitor newspaper of 29/09/2009 in the article "Government is to construct new modern markets", the government is to construct new modern markets in the seventeen towns of Uganda and the funds have been secured from World Bank. And in another related article by Karugaba in the New vision of Monday 13/09/2010 "Kasese market construction delays", reported that "the government had received a grant from World Bank to construct twenty six markets country wide under the markets trade and agricultural programme. However, the construction of Kasese market has delayed because of insufficient funds". Cyprian M in the New Vision of Wednesday February 16th 2011 page 3 reported that "Luzira land in Kampala meant for growing potatoes for Luzira prisoners was to be given away for industrial purposes and potatoes would be grown elsewhere. This was announced by President Museveni during his campaign at Luzira Boma ground for 2011 general elections".

Urban growth due to increased functions has great influence on the changing land uses and land use patterns over time. In general urban developments over time tend to lead to changes in land use. Lwasa (2004) acknowledges that, land market is a strong determinant of outward expansion of Kampala city, and Peri-urban areas of Kampala have under gone environmental and social changes caused by extension of urban uses into rural landscapes. Raven et al (1993) asserts that, urbanization and its accompanying sub urban sprawl particularly affect land use. Prior to World

War II, jobs and homes were concentrated in cities, but during the 1940s and 1950s jobs and homes began to move from urban centres to the suburbs. New housing, industrial and office parks were built on rural land surrounding the city along with a sub urban infrastructure that included new roads, schools and the like. Balchin et al (2000) argue that, urban growth alters not only the pattern of land use and land value, but also the intensity of site use. He further states that, what is referred to as socio-economic forces which determine or influence the changing urban land use patterns and the pattern of land uses within an area is a result of the interception of many socio-economic forces such as population growth, industrialization, traditions and cultures among others. Although the very basis of a city lies in its business and manufacturing activities, the residential functions cover the largest areas and form the citizen's surroundings for a large population of the day as it covers 43% of most urban areas. This is true with towns/municipalities where manufacturing, retailing and wholesale services are concentrated in the centre and along streets. Land use has changed in towns/municipalities where land for transport terminals is being used for retail shops as well.

David and Sue (2002) states that, houses are built on unused land that is not wanted at the time, for example on steep hill sides or derelict land along main roads into cities or along a single water supply. Settlements of many small crowded homes grow quickly in an informal way, with narrow alley ways, gutters for drains, and no running water or power. Often these shanty towns or squatter settlements grow into very densely populated settlements with many thousands of people. Over time, the buildings may become more permanent homes, built out of concrete and bricks. Charles (1985) points out that, although urban land use patterns are the results of physical and human factors, it can be argued that they are essentially the out come of economic motives. It's important to note that urban growth due to increased functions like social and economic services to cater for increasing population in urban centres leads to change in land uses and land use patterns.

Population growth or increase influence change in land uses and land use patterns as it exerts pressure on urban land resulting into encroachment on marginal lands for settlements leading to change in land uses and land use patterns. Pickering and Owen (1994) state that, rapid increase in population has placed great demand on the available living space, the trend towards urbanization has led to increase in size of settlements at an incredible rate and the exploitation of marginal lands. Pickering and Owen (1994) further argue that, the human impact on land has been enormous, as land use has changed, natural vegetation is cleared for agricultural use, settlements, and urbanization increase, reservoirs are created, minerals are extracted, and more land developed

for recreation purposes. Besides this there is a remarkable increase in commercial activities in terms of shops, supermarkets among others. There is loss of individual land which goes to industrial activity and increase in residential apartments as a result of increased population. NEMA (1998) points out that, the increasing urban population and booming building industry are exerting great pressure on mainly pre-urban forest reserves for expansion of urban centres and the reserves which are under pressure are Mbale, Soroti, Kabale, Fort Portal, Gulu and Tororo pre-urban plantations.

According to the 2002 Uganda Population and Housing Census, in the Mbale Municipality Analytical Report, it was reported that Mbale Municipality had a population of 71,130 people in 2002. The state of Uganda population report 2010 projected Mbale district to have a population of 416600 people and Mbale municipality to have over 100,000 people. This same population was projected to be 89,700 by 2012 (UBOS 2009). This shows that the population is indeed growing in the Municipality. This has significant influence on land use patterns in the Municipality. The Mbale Municipal Local Government Council three year Development Plan (2009/2010-2011/2012) further states that over population and land shortage is forcing people to encroach on flood plains and public land for recreational purposes, road reserves, public buildings and drainage channels. Therefore, population increase has a direct influence on land use changes in urban centres which this research intended to investigate in Mbale municipality.

Urban land use patterns are also influenced by physical factors which include; relief features, climate among others. Vestappen (1983) argues that, the general lay out of settlements and the situation of major functional zones such as residential, service and industrial areas are normally governed to a large extent by matters of relief where the general characteristics of urban structure reflect the availability of flat or gently sloping land. This argument is in line with that of Balchin et al (2000) which states that, wide differences in land use patterns of different urban areas are influenced by varying topographical or relief features and climatic conditions. Therefore, the physical characteristics of the land such as nature of slope for example steep slopes, gentle slopes, low lands or valleys, and other factors like soil depth, soil type, soil texture and climatic conditions determine how land is to be used giving examples of Berlin(1975), Calemberf (1958) in Germany. Vestappen (1983) further asserts that, a third group of physical factors affecting urban planning and construction relates to soil and sub soil conditions. The distribution of rock outcrops, the depth, solid rock thickness of weathered materials and of covering materials are matters of great concern for the urban planner and for urban engineer. The engineering properties of the soil and sub soil materials such as bearing strength are especially critical where heavy,

multi-storey structure have to be erected or in locating industries, if foundation problems have to be avoided.

However, it is also important to note that, the changing land uses and land use patterns have far reaching effects on the orderly growth of urban centres and the physical environment as follows: Loss of farm land to urban settlement is common. Cutter (1991) points out that, urban encroachment into prime land for agriculture is one of the main features contributing to loss of agricultural land like in California where the high cost of housing has forced residents to locate to previously agricultural areas in the central valley. This is in agreement with Cunningham et al (2004), urban sprawl consumes natural farmland to investment areas, institutions and parks. This is true with towns/municipalities where urban farmland has been turned into residential and commercial areas as reported by Cunningham et al (2004), the US department of housing and urban development consumes some 200,000 hectares of farmland each year. In both developed and under developed countries the wealthier class of town dwellers are constantly moving from the crowded centres of the cities to more pleasant suburbs where they can build larger houses and enjoy privacy of a garden around the house. Herbert (1972) pointed out that, the growth of cities has inevitably meant physical encroachment upon other uses of land, particularly agricultural, citing the example of European countries between 1937 and 1955 that, the area in the Ruhr region meant for building increased from 24.8% to 34.8% mainly at the expense of agricultural land which led to altering of urban plans.

Enger and Smith (2004) point out that, most of the land that has been recently urbanized was previously used for high value crops. Land that is flat well drained, accessible to transportation and close to cities is ideal farm land. However, it is also prime development land. Areas that once supported crops now support housing development, shipping centres and parking costs giving the example of San Jose, Miam and Los Angeles which were once agricultural areas of Califonia have long been transformed to suburbs, office complexes or shopping malls. Enger and Smith (2004) further reported that, urban development of farm land is proceeding at a rapid pace. Currently land is being converted to urban uses at a rate of 400,000 hectares (1,000,000 acres) per year and 1/3 of this land is prime agricultural land. Muhwezi (1995) reported that like other expanding cities in the world, the growth of Kampala city between 1990 and 1995 was a result of taking up important agricultural land and over 1,900 hectares of land were transferred to urban use during this period. This is in agreement with Nakatudde (2008) findings on real estate development, land tenure and land value dynamics in the pre-urban areas of greater Kampala who noted that, a lot of agricultural land was changed to built-up areas and forest land and wetlands

changing into agricultural, residential use and small scale industries hence reducing the land available for cultivation. Over time in a period of about 7 years since 2000, land use has been changing from agricultural land use to built-up environment. Leading to loss of marginal land, increased land market, and increased land settlement among others.

The evolution and change in land use patterns over time leads to urban growth /expansion which affects the physical environment in urban centres like pollution of rivers/streams and wetlands. NEMA (2006/2007) pointed out that, Uganda's growing population and poor industrial practices, inefficient use and pollution of rivers, lakes and wetlands poses a threat to water system. Urban growth that destroys wetlands also reduces the potential for water purification before waste water reaches the main water systems. Therefore, increased efforts will be needed in the short term and medium term to strengthen regulations and enforcement of water quality monitoring and effluents by firms located near water systems. Important to note is that proper management of water systems have direct impact on land use patterns in terms of controlling floods, and managing sewer.

For example Cunningham et al (2004) state that, in Bhopal, India and Mexico city squatter settlements were built next to the deadly industrial sites. In Egypt, Cairo's sewer system which was built about 50 years ago to serve a population of two million people is now over populated with more than ten million people. In India less than one-tenth of India's 3000 towns and cities have partial sewerage system and water treatment facilities. Pollution of air smoke, water, effluents from factories, oil and rubbish are other environmental problems that make urban centres unhealthy to live in. Saturday Vision of 25/09/2010 reported that, poor garbage disposal in Kampala city is polluting water and soil with a deadly chemical, causing mental impairment and other related hazards.

Urban centres are usually route centres where accessibility could be a major problem if there is no proper land use planning due to congestion such as crowded settlements, traffic and people. Enger and Smith (2004) assert that, most cities experience continual transportation problems. This is due to inappropriate consideration to transport routes due to scarcity of land and yet housing and commercial patterns change. Law and Smith (1987) are of the same view that, the developed and the developing world, for instance, Khartoum - Odurman has serious traffic congestion especially at the Nile crossing point. Digby (1996) pointed out that, traffic congestion in Bangkok is almost the worst in the whole world. The problems that the city faces each day are monumental with a huge city centre, surrounded by Sprawling suburbs containing almost 80% of the country's

vehicles. Cunningham et al (2004) states that, the United Nations estimated that at least one billion people (20%) of the world's population live in crowded, unsanitary slums of the central cities and vast shanty towns and squatter settlements that ring the out skirts of most third world cities. This is also in line with Law and Smith (1987) , increasing densities of population have occurred in areas enclosed by green belt and leap - flogging of the belt which has led to spontaneous development in towns such as Guildford. This increases residential settlement and other social amenities like recreational centres.

Urban growth and expansion leads to the drainage of urban wetlands and destruction of forests due to increased population that result into land pressure. NEMA (1998) further acknowledge that, on the whole, urbanization in Uganda has generally increased with some areas which were originally trading centres becoming townships or even town councils and most towns have also expanded in population sizes, area and dimensions, and the case in point is Fort portal which has been registering an average growth of 18% per annum. This expansion has impacts on settlements, wetlands, forest reserves, open spaces which greatly affect urban land use patterns. NEMA (2009) reports that, recent developments have seen the clearing of buffer zones of forests and open spaces, as well as encroachment on the wetlands. Buildings and other forms of infrastructure have replaced the forests, open spaces and wetland vegetation.

NEMA (1998) further pointed out that, industrialization has caused considerable loss of large areas of Namanve forest near Kampala (1000ha) and Wabisi-Wajala in Nakasongola district where 8744 hectares of land have been de gazetted for industrial expansion. Ephraim K in the daily monitor of Wednesday December 8th 2010 on page 6 reported that much of the wetland, located in Luzira, a Kampala suburb, has been destroyed by encroachers, claiming to be developers who have set up structures and started gardens on the wetland which has resulted into flooding in the area. Nakatudde (2008) found out that most of the wetlands in Southern Wakiso district along the shores of Lake Victoria have been encroached upon for urban development. Zanra .A. Daily Monitor of Monday November 17th 2008 page 3 in the related article "city wetlands face extinction due to heavy encroachment, reported that "Kampala has a total land area of 1965 kilometres, about 16% of which was original wetland. Today according to NEMA (2008) at least 18% of the wetland area in the city has been lost to human activity, for example, Kinawataka and Mbuya wetlands which are threatened by expansion of illegal settlements. Therefore, urban development has a significant impact on land uses, in that it increases demand for land use in urban centres and largely affects original planning hence exerting pressure on the available land and altering land use patterns.

Another effect of land use changes due to urban growth is that associated with hydrological problems in urban centres. Pickering and Owen (1994) assert that, urbanization can cause many problems associated with changes in hydrology of an area.

New canals may have to be constructed and rivers canalized. These, together with buildings, paths and roads, produce an impermeable surface over which water will flow. The use of storm sewers increases the rate and amount of water entering rivers. All these result in an increase in the magnitude and frequency of flooding events. Pickering and Owen (1994) further assert that, the extraction of ground water for domestic use in large settlements may also cause major alterations to the land surface, such as Stalinization and other effects like ground subsidence citing the example of cities like Venice, Bangkok, Fenland in UK and Jakata – Indonesia where the pumping of ground water for industrial purposes has caused gradual subsidence of buildings and increased flooding during winter and rainy season and intrusion of saline water in fresh water wells. Vestappen(1983) is of the same view that subsidence in urban areas may relate to the weight of structures erected but it is often also caused by extraction of ground water. This may have serious consequences for the drainage of urban areas affected and may even lead to inundations giving examples of cities like Tokyo, Matsuda 1975, Nakano 1970 in Japan.

In Uganda, NEMA (2000/2001) pointed out that, rapid urbanization has led to urban sprawl and physical infrastructure deficiencies as well as depletion of natural resources and increased discharge of unprocessed wastes in the environment resulting into severe health problems. NEMA (2009) further states that, Kampala's land surface in the built-up areas is highly paved leading to reduced water infiltration and hence generation of high storm waters and the storm water has of late caused flooding in places like Bwaise and most low-lying areas of Kampala city.

Land use conflicts and wrangles is another effect resulting from the changing land use patterns in urban centres due to unplanned and uncoordinated activities which come up in the towns without following structure plans/schemes put in place. Patrick .O. in The New Vision of Friday 19th September 2008, page 10, reported that "Lira hospital and Municipal leaders on Thursday clashed over Akii Bua stadium land". The commissioner of physical planning halted the construction of a mental unit at the stadium saying it was illegal as two structures have been built on the stadium as an extension of Lira hospital. However, the municipal authority said that the plan was not approved and the land was allocated without their consent. David M in the Daily Monitor of Friday 18th September 2009 page 7, reported that "Mbale Golf Club and NFA clashed over the Mbale Sports Club land as each party was claiming for that land. The land was gazetted for the

game in 1952 but in 1995, NFA took over the land turning it into a forest by planting trees. This has caused land use conflicts between Mbale Golf Club officials and NFA".

Wanasolo in the Weekly Eastern Eye newspaper of November 29th to December 5th 2010 page 3 reported that "Mbale Municipal officials engage in double allocation and selling of plots as issues end in courts of law causing land conflicts". In a related development, David M in the Daily Monitor of Thursday 17th June 2010 on page 8 further reported that "controversy had emerged over a plan by Mbale Municipality to acquire about 400 acres of land which belonged to NFA for expansion in order to qualify for a city status". Daniel E in the New Vision of Thursday 9th December 2010 page 28, reported that "Uganda National Road Authority (UNRA) condemned part of the storey building under construction at the Mbale Bus Park in Industrial division and the council had been directed to break the structure so as to avoid conflicts with the road authority". It is important to note that, the above controversies over land issues are as a result of poor land use planning and failure to follow structure plans put in place to guide the allocation of land in urban centers. This has a significant impact on the changing land use patterns over time because government and individual peoples' priorities change and thus the conflicts arise over land uses and land users. Therefore, this research intended to examine the causes and effects of urban growth in Mbale municipality and its subsequent effects on planned land use patterns in relation to Mbale structure plans/schemes of 1954 and 1997.

2.3 The role of structure plans/schemes in urban development.

The role of structure plans/schemes in urban development has been recognized as relevant to the orderly growth and expansion of urban centres. For example Digby et al (1996) in the study carried out in Chicago in the US, classified land use and utilization in urban areas to include arable land, horticulture, health and Bogland, wetland and water, coastal feature, quarries and extract, industries, transport routes and features, buildings, institutions, planned open space and miscellaneous land. In order to effectively allocate urban land to suit the above classification of land uses (activities) proper land use structure plan or scheme must be drawn with consideration to the physical characteristics of the land and its capability to support the activities allocated on land. Dwyer (1981) argues that, the plan as a whole is indicative; policy oriented document rather than a definitive land use plan based on a statutory map governing land use allocation in terms of zoning regulations and other controls. Everson et al (1972) in the study carried out in Britain noted that, proper structure town plans were drawn indicating zoning for industrial purposes and allowing for growth of residential areas. Arthur (1978) while commenting on the structure plan for greater Paris in France pointed out that, inclusion of five new towns and re planning the

decayed and congested city centres were expected to address the issue of orderly expansion and evolution of land use patterns. Dwyer (1981) noted that, in India after five years of preparatory work the Calcutta metropolitan planning organization published its basic development plan for the Conurbation in 1966 and this was an important document as it indicated the allocation of land uses in the districts allowed by right and general restrictions.

Encarta (2008) in a free internet encyclopedia points out that, the emphasis on planning broadened during the Greek and Roman eras. The Greek architect Hippodamus of Miletus planned important Greek settlements such as priene and Piraeus. He emphasized a geometric design for towns. Religious and Civic Citadels were oriented so as to give a sense of aesthetic balance; streets were arranged in a grid pattern and housing was integrated with cultural, commercial and defence facilities.

In Uganda, Kendall (1955) states that, in the Kampala structure plan of 1951, in the same way Naguru the neighboring hill has been reserved for African housing while the North of Kololo is almost entirely occupied by sections of the Asian population comprising government officials and those engaged in business and trade. The local authority has evolved a system of controlling the development of flats by insisting on a minimum of 700 square feet floor area. Provision exist permitting higher densities where flats are erected adjoining private or public open spaces. The same author while commenting on the Mbale structure plan/scheme of 1954 asserts that the development plan for the township makes provision for the widening of the main roads leading to the North and west. At the present time investigations are being carried out regarding the necessity for a second major arterial road which will develop considerable areas to the west of the main residential zone. Provision to meet considerable expansion has been made for light industries and workshops in the vicinity of the railway station. Considerable areas are still available for residential development of all types and these localities are being carefully planned. Most of the government quarters are located to the East of the town on the spur leading towards the foot hills of Mt Elgon. A large site has been reserved for the development of African neighborhood units astride the main road from Mbale to Soroti, and to the west of the main road various Indian associations are building social and cultural centres. The purpose of this research therefore was to establish the relationship between the current urban land uses and Mbale urban structure plans/schemes of 1954 and 1997.

CHAPTER THREE

STUDY AREA AND METHODOLOGY

3 Introduction

This research is about factors influencing the changing urban land use patterns in Mbale municipality since 1995. This chapter presents the physical aspects and characteristics of the study area and the methodology used in the research study. In this chapter physical aspects and characteristics of the study area like relief, drainage, soils, geology, climate, vegetation and socio-economic aspects have been looked at. The methodology used in the research has been described such as research design, study population, sample size and selection of respondents, sampling techniques, study instruments and methods used in the study to collect data such as observation, questionnaire, interview guides and documentary review. This chapter further looks at the validity/reliability of the instruments and data analysis.

3.1 The Study Area

3.1.1 Location of the study area

In terms of absolute location Mbale Municipality is located 34^0 10^0 East of the Prime Meridian and 1^0 05^0 North of the Equator in Eastern Uganda. In terms of relative location, Mbale Municipality is situated at the foot hill of Wanale ridge (242.4m above sea level) the most prominent westerly ridge of Mount Elgon in the East of Mbale district. Mbale is bordered by Manafwa and Bududa Districts in the East, Sironko in the North, Bukedea in the North West, Budaka and Palisa in the west and Tororo and Butaleja in the South west. See the location of Mbale Municipality in Figure 3.1.

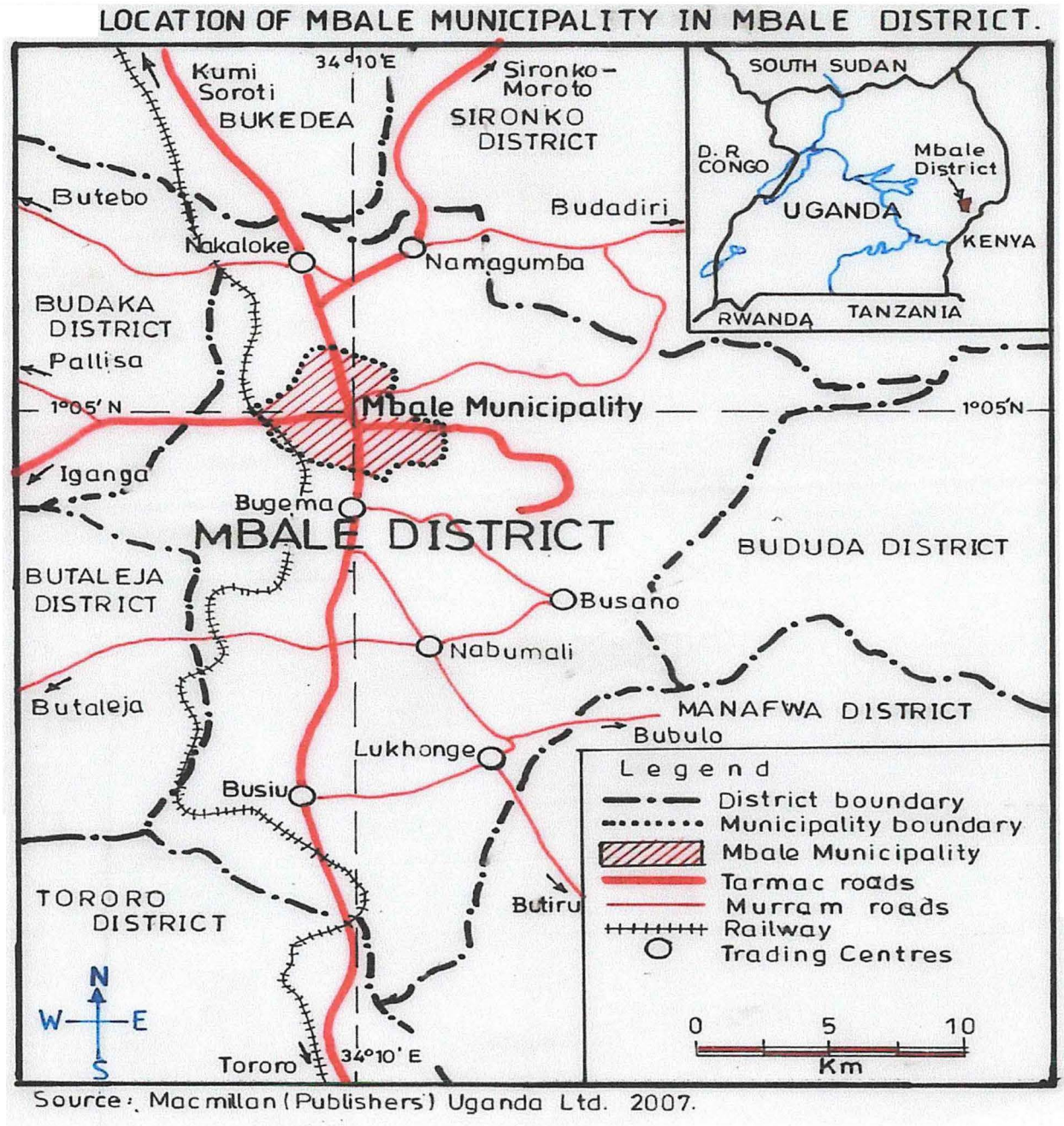


Figure 3.1: Location of Mbale Municipality (study Area)

3.1.2 Size

Mbale municipality covers a geographical area of about 2435 hectares, (10sqare miles 24.35 square kilometers.). (Mbale municipality local government 3 year development plan 2009/10-2011/12).

3.1.3 Relief/topography

Mbale is divided into three distinct topographical regions, namely; lowland, upland and mountainous landscape. The most striking topographical feature is Mt Elgon, with magnificent

craters, deep valleys and ridges. Mbale is made up of hills and valleys. Mbale stands at approximate altitude of about 4040ft (1224.2meters) to 14176ft (4324m) above sea level. (Hargrave,1972).

3.1.4 Drainage

Mbale Municipality is drained by three major rivers/streams flowing from East to West having their sources on Wanale ridge. River Nashibiso and its tributary Napwoli drain the Southern part of the town. These are bound by an extensive plain under forest reserve management. River Nabuyonga and its major tributary Namazyo drain the Northern area of the town. Several primary and secondary tributaries have developed originating from within the town areas and draining into these rivers. All the mentioned rivers drain into River Namatala that forms the North West boundary of Mbale town (Mbale Municipal Three year development plan 2009/2010 – 2011/2012).See drainage and relief of Mbale Municipality in Figure 3.2.

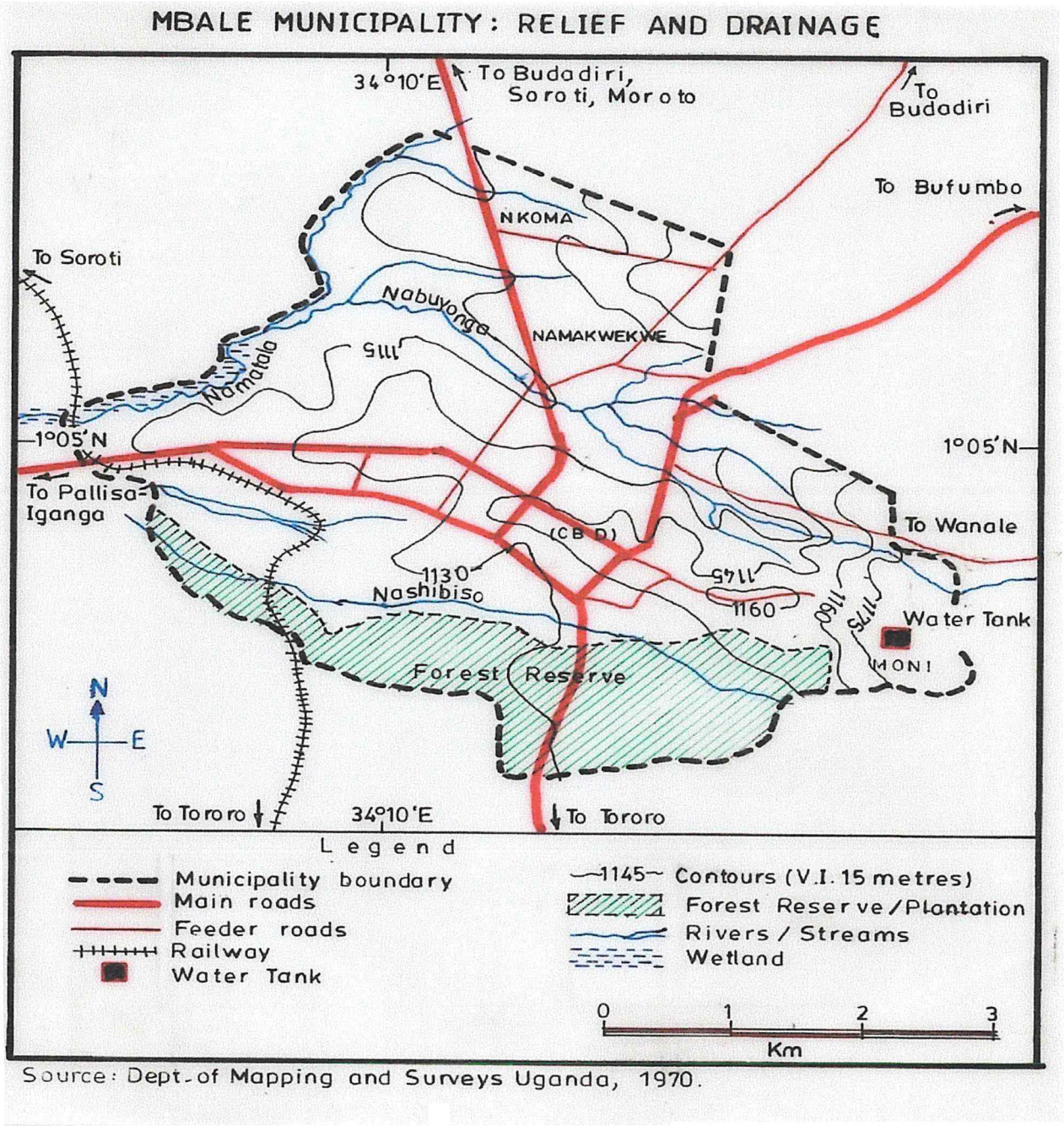


Figure 3.2: Relief and Drainage of Mbale Municipality

3.1.5 Climate

The climate of Mbale is influenced by its proximity to the equator and its situation at the foot of Wanale ridge. The huge volcano of Mt Elgon with a height of 14176ft (4324m) above sea level has a considerable influence on the climate of Mbale area (Hargrave 1972). Climate is warm and humid without extremes. There is hardly any seasonal variation of temperature throughout the year. Rainfall is fairly distributed ranging between 1,250 and 1,750 mm per year and it is basically relief rainfall. The town enjoys attainable maximum of rainfall during the months of March to May and August to November. Rainfall amounts are sufficient to impart sustenance to

the growth of annual and perennial food crops both within and outside the Municipality that supports the urban population today (Mbale civic sense magazine 2008). See Tables 3.1 and 3.2 for climatic statistics of Mbale.

Table 3.1: Precipitation and evaporation (mm) for Mbale

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Rainfall(mm)	46	67	126	200	209	99	92	121	130	155	148	63	1456
Evaporation	149	149	146	114	114	117	112	115	129	121	108	121	1495

Source: national agricultural research organization (NARO 2001)

Table 3.2: Rainfall distribution (mm) of Mbale

Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
22.8	50.8	93.9	167.6	170.1	127.0	116.8	137.2	111.8	81.3	60.9	43.2	1160.6

Source: Hargrave (1972).

3.1.6 Geology

According to NARO (2001), the classification of the rocks of Uganda is based on the time of formation and the type of rock. Sediments underline some of the volcanoes; the most extensive of these is the Bugisu series associated with Mt Elgon. The basement complex of Mbale municipality is firm and stable, rendering it ideal for the development of housing to the high density settlement (Mbale municipal local government 3 year development plan 2009/ 2010-2011/2012).

3.1.7 Soils

The soils of Mbale town are largely of the formalistic gneiss that is in the last stages of tropical weathering. These are young soils derived from volcanic and alluvial materials with adequate nutrient reserve that renders them fertile and productive for support of plant life (NEMA, 1998). The types of soils found in Mbale are also of clay type especially in the swamp areas, valleys / low land areas, sandy and loamy soils especially on the gentle slopes. (Nzabona2007). According to NARO (2001) several distinct soil units have been recognized on Mt Elgon. All the soils are derived from volcanic ash and agglomerate, as very little lava was emitted during the formation of the volcano. In general, colluvial soils occupy the plains which spread out from the foot hills of the volcano. Below the foot-slopes, at 1200m are deep, red and black colluvial soils which have similar physical and chemical properties as vertisols (Sebei series).

3.1.8 Vegetation

The natural vegetation of Mbale region is mainly savanna ranging from tropical, grassland, plains with forests and alpine vegetation towards the mountain summit. The different vegetation zones include grasses, forests and swampy vegetation (NARO 2001). The large part of the municipality is developed such that it has presented a modified vegetation cover with limited traces of natural vegetation and most of the vegetation cover is of secondary growth (NEMA 2006).

3.2 Demographic characteristics of the study area

3.2.1 Population distribution

Population distribution in Mbale municipality is unevenly distributed. Industrial division has the highest population followed by Northern division and Wanale division having the lowest population. See Table 3.3 for population in Mbale municipality.

Table 3.3: Mbale Municipal population distribution by division

Division	Male	%	Female	%	Total	Total %
Industrial	19,100	45.6	19,400	43.8	238,500	45
Northern	16,600	39.6	18,200	41.1	34,800	40
Wanale	6,200	14.8	6,700	15.1	12,900	15
Grand Total	**41,900**	**100**	**44,300**	**100**	**86,200**	**100**

Source: Adapted from UBOS 2007, Uganda Population and Housing Census Report

The population of Mbale Municipality is distributed in the three divisions with the largest, most populated and economically most prosperous being Industrial division with 45% followed by Northern with 40% and then Wanale division with 15%. The large population in Industrial division is attributed to the large population of migrants as compared to Wanale division which is predominantly a residential area comprising of mainly Senior quarters. Industrial division is also the location of most industrial set ups in the Municipality and the busiest part of the central business district (CBD). This explains its relatively high population. Wanale division originally a residential area for top administration from colonial times has remained basically residential with mainly hotels and only the slum dwellings in Mooni and Buasamaga being densely populated. (Mbale Civic sense magazine 2008).

3.2.2 Socio-economic characteristics of the study area

The main socio-economic activities in Mbale Municipality comprise of commercial activities in the Central Business District. The Municipality plays a major role as far as the areas/location of

operation, the quality of the premises and the licensing of the business units are concerned. Related to commercial are processing and manufacturing sectors. However, the Municipality is experiencing a steady growth in activities of the informal sector. Indeed most of the commercial activities could be described as informal sector activities. Map of Mbale municipality in Figure 3.3 shows the lay out of some human infrastructure like road network that connects the municipality to other areas for commercial activities.

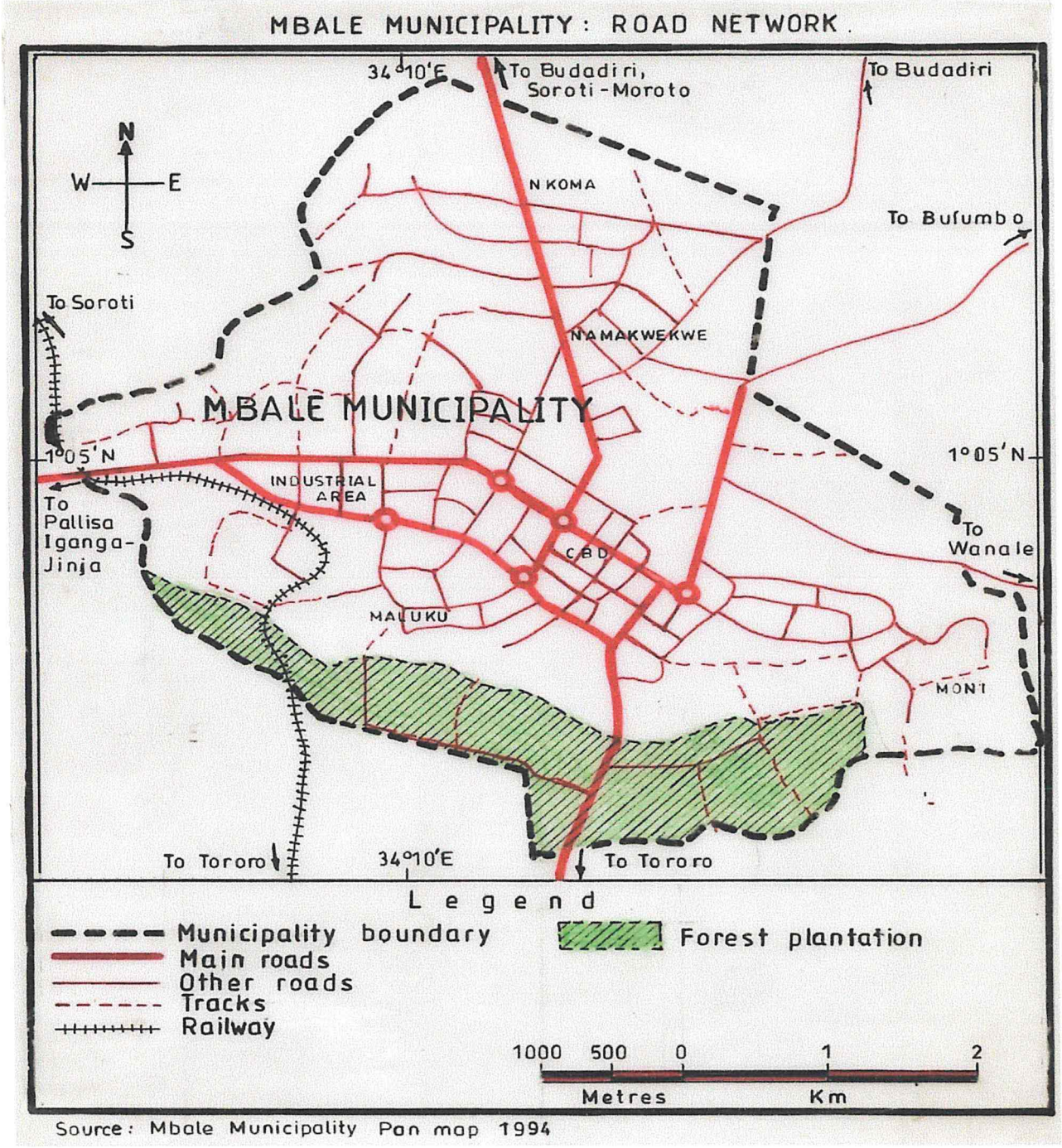


Figure 3.3: Road Network of Mbale Municipality

3.3 RESEARCH METHODOLOGY

3.3.1 Research design

The study adopted a descriptive and retro-prospective study design using both qualitative and quantitative methods of data collection. Descriptive design was good because the situation was described as it was seen while retro-prospective was good because it gave the general view of the study before and after the situation. This study included homesteads, commercials, industrialists and planners. These categories of people were chosen because they are direct land users of land in Mbale municipality. Descriptive and retro-prospective study designs can be used to describe and investigate the phenomena, situation or issue that has happened in the past. They are usually conducted either on the basis of data available or on the basis of respondents recall on the situation such as utilization of land before a certain period. Therefore, the researcher felt that this study design was appropriate to this study because it looked at previous land use patterns in Mbale Municipality before 1995 and describes the current land use patterns after 2011. The data is also collected retro-prospectively from existing records before intervention and then study population is followed to ascertain the impact of the intervention. This involves the researcher introducing the intervention that it assumed to be a cause of change and observing the phenomena and attempting to establish the cause of change.

3.3.2 Study population

This research is about the changing urban land use patterns, in Mbale municipality. Therefore, the study population consisted of divisions of Industrial, Northern and Wanale. Mbale Municipality in all has about 5,000 settlements with a population of 200 industrialists, 1,497 commercialists, 3300 homesteads and 3 planners. It is from this population that industrialists, commercialists, homesteads and planners were sampled for the study.

Source: Mbale Municipal Planning unit.

3.3.3 SAMPLE SIZE AND SELECTION OF RESPONDENTS

The number of homesteads, commercials and industrialists in the three divisions of Mbale Municipality was estimated to be about 5,000 and it was from this that a representative sample was selected from each division. In total, a sample of 103 respondents was selected purposively because it was about 2.06% of the total population and the selection was as follows: 48 homesteads, 30 commercials, 22 industrialists, 3 planners which included District planner, Municipality physical planer and an Economic planner in the Municipality. More industrialists (20) were selected from Industrial division because industries are concentrated in this division, 1

industrialist was selected from Northern and another from Wanale division because these had almost no industries except 2 grinding mills. Both large and small scale industrialists were selected but more small scale industrialists were selected because they are the majority. About 5 large industrialists were selected and 17 small scale industrialist. A total of 3 planners were selected for interview using interview guides. This is because there are only 3 planners and these include; District planner for the whole District including the Municipality, physical and economic planner for the municipality. The sample size was selected as indicated in the Table 3.4.

Table 3.4: Distribution of selected respondents by division

Division	Homesteads		Commercials		Industrialists		Planners		Totals	
	Total	selected	Total	selected	Total	selected	Total	selected	G.Total	selected
Northern	1099	16	499	10	1	1	1	1	1600	28
Wanale	1239	18	349	7	1	1	1	1	1590	27
Industrial	962	14	649	13	198	20	1	1	1810	48
Total	**3300**	**48**	**1497**	**30**	**200**	**22**	**3**	**3**	□□□0	**103**

Source: Field survey 2010/2011

3.3.4 Sampling techniques

The researcher used a purposive sampling method to select the respondents. Purposive sampling is a process or procedure where a researcher selects a specific group of people/respondents who have the information needed in the study. Purposive sampling technique was chosen because it is convenient for collecting data from respondents who are reliable and more knowledgeable about the topic of study and therefore in position to give reliable and detailed information about the topic. Stratified and simple random sampling was also used hand in hand with purposive sampling to arrive at the number of respondents from homesteads, commercials and industrialists. Out of the total population of study, 103 respondents were randomly selected. This method was used because it avoids biasness and increases chances of validity and reliability of the data collected. Stratified sampling is where respondents are grouped and a sample picked from each group. Gregory (1978) states that such a grouping of data, with a sample picked from each group, gives rise to a stratified sample, and each group that is sampled is referred to as stratum, that is, the data and also the sample are divided into layers or strata. For a random sample tends to select a number of items in each stratum proportional to the size of that stratum, but ideally a random sample should be selected from each stratum separately. The respondents were grouped and picked randomly using simple random method.

3.3.5 Instruments

The researcher used the following research instruments; camera which was used for taking photographs in the field, the tape measure was used to measure/determine distance of streets, hoe, spade, and panga were used to collect the sample of soils in the area from different places, and interview guides were used to collect data from planners, and questionnaires for the main respondents, among others.

3.4 Methods used in data collection

3.4.1 Observation

Observation is defined as a way of collecting primary data by purposeful systematic and selective way of watching and listening to an interaction of phenomena as it takes place (Kothari 2004). Observation method has been used by many researchers in carrying out similar studies in Geography relating to land use issues, for example, Muhwezi (1995), Nakatudde (2008) carried out similar studies on land use in and around Kampala City in Uganda and adopted observation method for data collection. Therefore, the researcher felt that observation is more appropriate for this study and it constituted the main research method. The researcher observed the current land uses and land use patterns, differences in architecture and urban structures reflecting previous and current developments, relationship between land uses and landscape physical characteristics, the layout of Mbale Municipality and its land use patterns, effects of the changing urban land use patterns on the physical environment in Mbale Municipality among others.

Observation was adopted because the information obtained under this method relates to what is currently happening. This method is independent of the respondents' willingness to respond and as such it is relatively less demanding of active co-operation on part of the respondents as happens to be the case in interview or questionnaire method. Observation allows the collection of wide range of information even when this information is thought to be at the time of study irrelevant.

3.4.2 Questionnaires

A questionnaire is a list of questions printed/typed on paper and sent or just mailed using internet to respondents to fill in the answers in written form. Questionnaires can either be administered personally (by the researcher) to the respondents or by research assistants. Kothari (2004) asserts that questionnaire method of data collection is quite popular, particularly in case of big enquiries; it is being adopted by private individual research workers, private and public organizations and

even by the governments. Therefore, the researcher felt that this method was also relevant to this study to collect data from homesteads, commercials and industrialists because these were quite many and others like industrialists are busy who need ample time to respond to the questions. Therefore, other methods of data collection like interview method could not apply on them thus questionnaire was preferred for this reason. The researcher also felt that questionnaires were good and convenient to collect data from a busy class of people. The researcher used open ended questions. Open ended questions are good because they make data analysis easy and do not restrict respondents' views. Questionnaires are cost effective and free from bias of the interviewer/researcher as answers are in respondents' own words. Questionnaires also give respondents adequate time to give well thought answers.

3.4.3 Interview Guides

This is a form of unstructured or in-depth interviews where the interviewer or researcher develops a framework called an interview guide within which to conduct the interview. Within this structure the interviewer formulates questions spontaneously during the interview. This method was used for the planners to get their views regarding land use issues and management in Mbale Municipality. This method was preferred because the planners were technical respondents in the study. Therefore the interaction was necessary between the researcher and the planners to get in-depth information about land use issues in the area.

3.4.4 Documentary review

The main sources of secondary data included the following: Internet surfing, magazines, articles of news papers, reports and publications, public records and statistics. For orientation in the field, existing data sets like topographic maps, land use maps, urban structural maps, census reports and text books were consulted. From these sources, location of the study area, population characteristics and existing literature related to land issues was obtained.

3.5 Reliability/Validity of the Instruments

This is the extent to which a method of data collection yields consistent results. In this study, reliability and validity was ascertained by using a pilot run. A pilot study was carried out in one area of Mbale municipality which was not included in the final study in order to find out the reliability and validity of the instruments.

3.6 Data analysis

Data was analyzed using frequencies and percentiles for different levels of variables. The descriptive approach was used for qualitative forms of data. Data was analyzed and presented using Tables, graphs, pie charts as well as photographs and maps to reflect the current land use patterns. Research questions were analyzed one by one using Tables, graphs and pie charts.

CHAPTER FOUR

DATA PRESENTATION, INTERPRETATION, ANALYSIS AND DISCUSSION OF THE RESULTS

4 Introduction

This study was about factors influencing the changing urban land use patterns in Mbale municipality since 1995. This chapter deals with data presentation, interpretation, analysis of results and discussion. The analysis of results has been presented in accordance with the research questions that guided the study.

4.1.1 Description of the Previous and current land use patterns in Mbale Municipality since 1995 and factors affecting them

Land use patterns refer to categorical arrangement and classification or specification of forms of land use. Previous land use patterns refer to old arrangement of forms of land use in Mbale municipality before1995 while current land use patterns refer to the recent arrangement of forms of land use in Mbale municipality between1995-2012. Land use patterns defer in all the three divisions in Mbale Municipality comprising of built up area (Central Business District), residential, administrative, institutional, recreational, open spaces, agricultural and conservation among others. In the three divisions previously before 1995 lowland areas were reserved for conservation and for public open spaces and industrial activity in industrial division. Gently sloping areas were mainly for residential and commercial purposes. The Central Business District was mainly for commercial and some administrative purposes. Currently, between 1995-2012 land uses have been mixed up in all the three divisions. You find both residential and commercial activities taking place in areas meant for either public open spaces or industrial activity. This is in agreement with Muhwezi (1995) who argued that, a general look at Kampala city and its immediate surroundings brings out three major land use categories which include: urban and built up land, referring to all land containing urban developments like residential, commercial, institutional, recreational and other developments. Non-urbanized and none built -up land; referring to all urban land containing non-urbanized developments especially agricultural and forest land. Open water and wetlands; referring to all areas covered by open water or swamps. An observation of Mbale municipality land use map of 1994 indicates a number of previous land use patterns before 1995.These range from commercial, residential, industrial, agricultural, institutional, administrative, recreational, public open space and conservation among others in Industrial division. In Wanale and Northern divisions, industrial uses were not catered for. In

Wanale division some areas were zoned for low density residential in Senior quarters while in industrial and Northern divisions both medium and high density residential areas were zoned. For details see the pattern of land use of Mbale town 1994 in Figure 4.1.

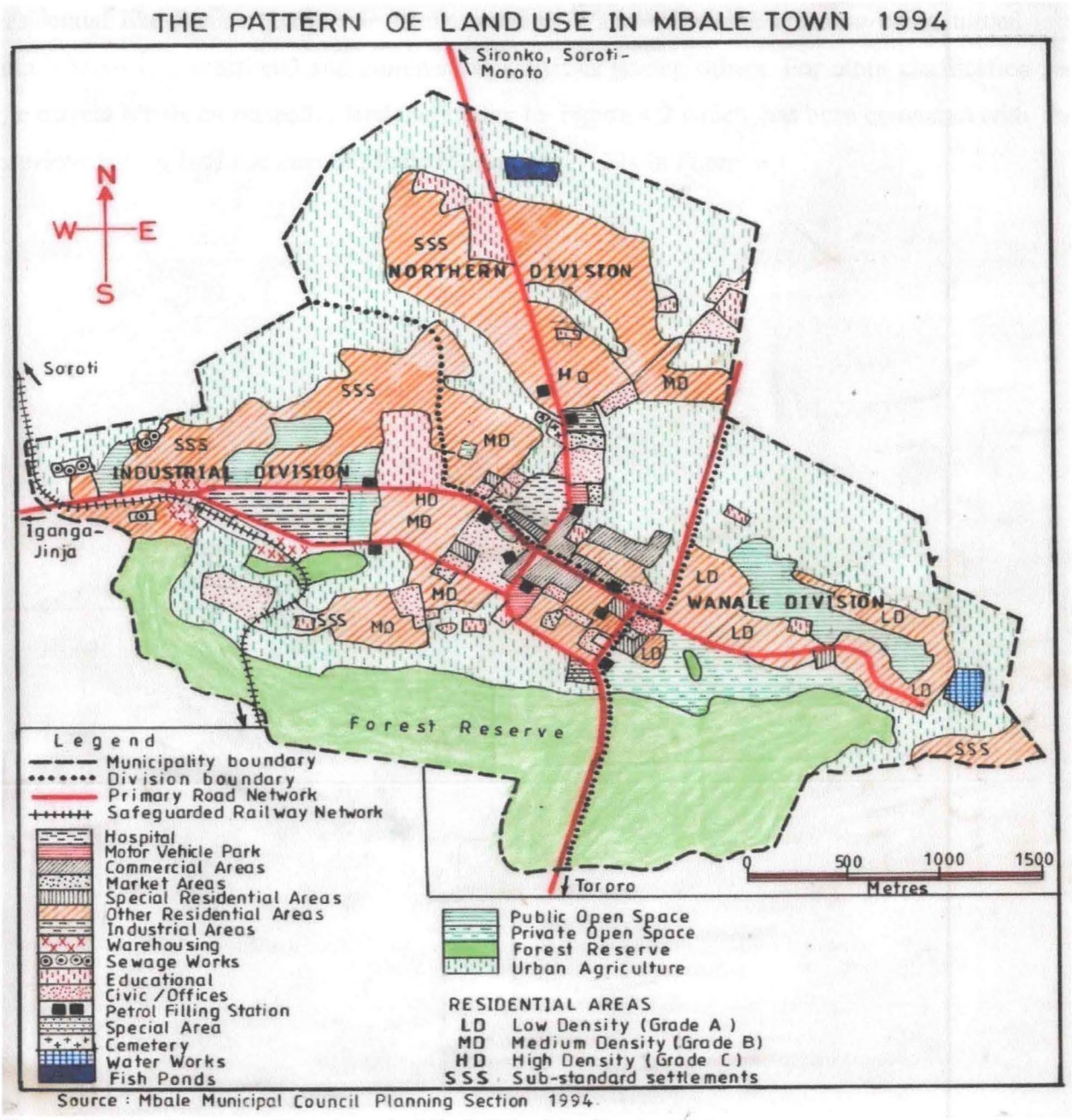


Figure 4.1: The Pattern of Land use in Mbale Municipality in 1994

However, on observation, the study revealed that some of the above land use patterns as seen in Figure 4.1 have been altered or converted into other land uses in all the three divisions of Wanale, Industrial and Northern for example areas which were previously meant for conservation have been encroached upon for both residential and commercial activities. Some portions of the forest reserve in Southern part of Mbale in Maluku ward has been encroached upon for settlement and

urban farming. Areas which were previously public open spaces like Uhuru valley in North central ward behind Mbale High Court in Northern division has been encroached upon for administrative, commercial and farming activities. Areas which were meant to be purely residential like Senior quarters in Boma ward in Wanale Division are now being turned into administrative, recreational and commercial activities among others. For more clarification see the current Mbale municipality land use zoning in Figure 4.2 which has been compared with the previous zoning land use map of Mbale Municipality 1994 in Figure 4.1.

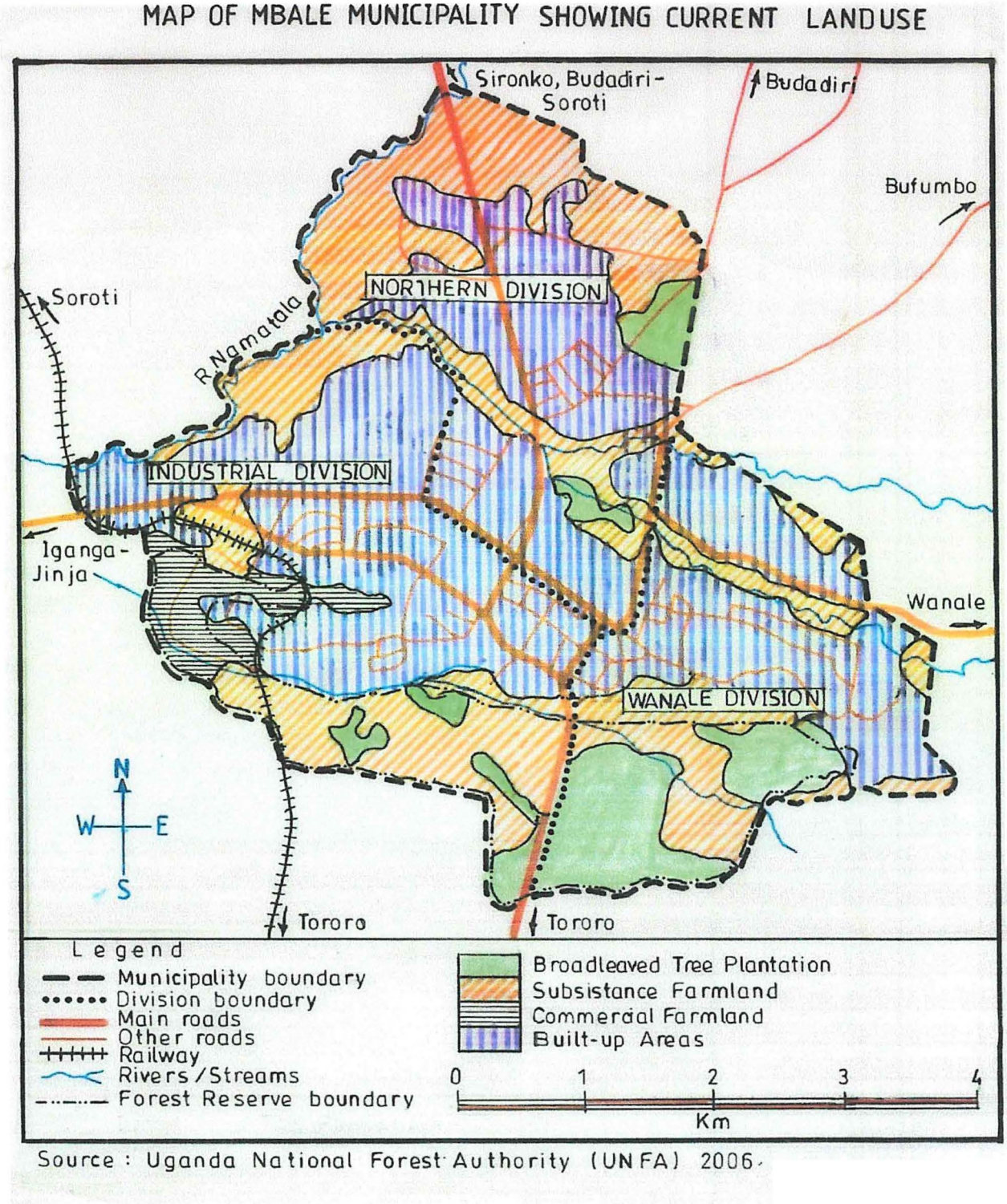


Figure 4.2: Current Land use Patterns in Mbale Municipality

4.1.2 Previous and current land use patterns in Northern Division

Northern Division is made up of Nkoma, Namakwekwe, Nabuyonga, North Central Ward which is part of the Central Business District and University Ward. With reference to the previous land use map in Figure 4.1, the previous land use patterns in Wanale division were identified as described below. In areas like Namakwekwe there were old buildings, and some were grass

thatched, which is an indication that this area was meant for residential settlement. Wattle houses made of mud were noticed in Kikyafu Cell in Nabuyonga Ward of Northern Division a further indication that this area was meant for residential. In Nkoma Ward, there was urban agriculture in the valleys and the soils were clay in nature like those of the North Kyoga Region. Old grass thatched and wattle buildings were seen hence suggesting that the area was largely residential. The photograph in Figure 4.3 was taken from a residential area in Kikyafu cell in Nabuyonga ward in Northern division.

Figure 4.3: Wattle old buildings in Kikyafu Cell in Nabuyonga Ward

Source: Field research findings 2011

Figure 4.3 shows how land is being utilized in Northern division reflecting high demand for housing and that land formerly reserved for open spaces is being encroached upon. Thus change in land use patterns.

In reference to the Mbale zoning land use map of 1994 and the current land use map in Figures 4.1 and 4.2, some parts of Northern division were previously residential areas especially in Nabuyonga and Nkoma wards while some part of North central ward was for commercial especially that part that make up part of the CBD on Republic street, and on Kumi road. The remaining part of the North central ward in Northern region was previously for conservation and public open space.

Currently in Northern division in Nkoma and Nabuyonga wards in areas like Namakwekwe estate, mission and Kikyafu cells among others which were previously purely residential areas are now being turned into commercial. Some modern commercial buildings are coming up along side

residential apartments of modern quality containing tiles and modern iron sheets which have replaced old wattle structures made of mud with old iron sheets and some grass thatched. Trading centres and markets have emerged in residential areas in Northern division for example Kyikindu market in Namakwekwe. In North central ward in Northern division, it was observed that there is encroachment on the portion of the reserved urban forest for example where Ahamadiya Muslim hospital, Mt Masaba High school and Kumi road market are located.

Public open spaces like the Uhuru Valley behind Mbale High Court have been turned into agricultural land, administrative and institutional for example, where Grace Primary School and extension of public offices. Figure 4.4 is an example which shows encroachment on public open spaces in Northern Division

Figure 4.4: Residential encroachment on Uhuru Valley (Public open space) in North Central ward in Northern Division

Source: Field research findings 2011

Figure 4.4 shows encroachment on public open spaces with the extension of an administrative office in the valley plus schools and maize gardens in the middle ground and foreground. Thus turning the land use pattern from public open space to built-up area

A survey was further undertaken in Namakwekwe Estate in Northern Division to ascertain the number of residences that have been turned into commercial and other functions. The following was revealed as indicated in Table 4.1.

Table 4.1: Number of residences that have been converted into other functions in Namakwekwe Estate in Northern Division

Change in Functions	Frequency Distribution	Percentage
Maintained as Residences	123	67
Residences to commercials	30	16
Residences to offices	10	6
Mixed	20	11
Total	**183**	**100**

Source: Field Survey 2011

From Table 4.1, it can be seen that 67% of the houses have remained residential, 16% have been turned into commercial institutions, for example, Lisa Primary School, Hope Clinic Namakwekwe, PAL Annex supermarket, Kayira Complex among others. About 6% have been turned into administrative offices, for example, Northern Division office, BRAC office among others while 11% are used for both residences and commercials in form of shops and residences, shops and rentals. Namakwekwe Estate was established by the colonial government to take care of low income residential houses for civil servants. Therefore, emergence of commercial and administrative functions in houses purely meant for residential indicate that there are changes in land use patterns in Mbale Municipality. Figure 4.5 is an example of a residential house that has been turned into a school in Namakwekwe estate in Northern division.

Figure 4.5: Former residential premises/structures that have been turned into a school in Namakwekwe Estate in Northern Division

Source: Field research findings 2011

Figure 4.5 shows formerly residential structures that have been turned into a school in Namakwekwe estate in Northern division. Thus changing the land use pattern from residential to institutional and commercial in Mbale municipality

A question was put to the selected respondents (Business People/Commercials) in Northern Division about the activity in the area before respondents started operating business and the following responses were given as presented in Table 4.2.

Table 4.2: Activities in the area before business operation in Northern Division

Activity in the area	Frequency Distribution	Percentage
Residential	3	30
Commercial	6	60
Empty space	1	10
Total	**10**	**100**

Source: Field Data 2011

According to Table 4.2 it can be observed that 60% of the respondents admitted that the major activity before business started in the area was commercial, 30% mentioned residential and 10% said that the area was empty space with no activity. Majority of the respondents (60%) concurred that the major activity before business started in the area was commercial. The nature of the commercial activities are in form of small retail shops, markets selling mainly food staffs, informal activities like tailoring, bicycle repairing among others around Nkoma. The commercial activities have come up in areas like Kikyafu , Namakwekwe , Kiteso and Mission cell along side residential activities. The new structures coming up are for both residential and commercial thereby changing the land use pattern from purely residential to mixed land use pattern. However, large commercial activities in form of whole sale shops, supermarkets have emerged along Mbale–Kumi high way in Nkoma and Namakwekwe wards. The change in land use pattern from residential to commercial and mixed land use patterns is due to increased demand for goods and services as a result of high population growth in Northern division. This argument concurs with Arthur (1978) that urban centres have grown to be cheap market centres of an area because such functions as retail shops, wholesale, warehouses, banks, garages have developed to meet the requirements of the town's population. Therefore, it is the emergence of such commercial activities that have had impact on the general land use pattern in Mbale municipality.

4.1.3 Previous and current land use patterns in Industrial Division

Industrial Division comprises of South Central Ward which constitutes mainly the Central Business District, Masaba, Maluku and Namatala Wards. In reference to the previous land use Map of Mbale in Figure 4.1 the following previous land use patterns were identified as described below.

In Industrial Division land use patterns differ from Ward to Ward. In Maluku Ward agriculture was evident, old buildings were seen implying that previously the area was for agriculture and residential. In Masaba Ward, Indian old buildings were noticed and recreational facilities like Mbale Municipal Stadium, Children's Park along Pallisa Road opposite Nkoma Secondary

School do exist. This is an indication that this area was largely for residential. In Namatala Ward in Doko Cell swamps were seen. This is an indication that some of these places were reserved as wetland areas mainly for sewerage disposal. There was also a forest for example Mbale Central Forest Reserve. The South Central Ward which constitutes mainly the Central Business District has remained commercial due to existence of mainly Indian old buildings containing shops which bear years before 1995.

The foregoing information is reflected in Table 4.3 where respondents/residents were asked about major activities they found before settling in the area and the following responses were given as presented in Table 4.3.

Table 4.3: Activities in the plots before respondents started staying in the area

Activity in the area	Frequency Distribution	Percentage
Residential	03	21
Commercial	04	31
Mixed land use	07	48
Total	**14**	**100**

Source: Field Data 2011

In Table 4.3, majority of respondents in Industrial Division agreed that land was used for more than one activity. This shows mixed land uses with different activities like farming, settlements and encroachment on reserve land was common. In all like any other Division old buildings of Indian architecture and style were seen in Indian quarters in Masaba Ward. Grass thatched and wattle houses were seen in Namatala and Maluku Wards, which indicates that this area was previously meant for residential and farming. An example of a photograph which was taken to show mixed land use activities in Maluku ward in Industrial division is given in Figure 4.6.

Figure 4.6: Mixed land uses reflecting previous land use patterns in Maluku Ward in Industrial Division

Source: Field Research Findings 2011

Figure 4.6 shows that this area was previously used for different purposes like farming and settlements. This argument seems to agree with NEMA (2009) land use in Ugandan urban centres is mixed throughout the Districts consisting of built up area, agricultural land and conservation area. With reference to the previous land use zoning map of Mbale municipality 1994 and current land use zoning map, in Figures 4.1 and 4.2 some land use patterns have changed in Industrial division in all the wards of Industrial division. For instance in Namatala ward in Doko cell and Southern part of Industrial division in Maluku ward which was previously conserved area for forest and wetland has been encroached upon for institutional commercial and residential. However some portions of the forest reserve have been encroached upon for commercial, residential settlements and urban farming. In Industrial Division in Maluku Ward which was meant for residential mainly for the blacks has almost turned into commercial with mushrooming commercial activities like markets. For example, Bugwere road market, Maluku market and hostels for students, for example, Mama Nalongo Boys and Girls hostel in Indian Quarters in Masaba Ward. Hotels like Wash and Wills, Westend Inn, Pretorial, Bellodian inn among others have emerged. In Maluku ward public open spaces have been encroached upon for

farming signifying change in land use patterns in Industrial division. Examples of photographs which were taken from the area to show the current encroachment on areas that were previously conserved areas and public open spaces in Industrial division. See in Figures 4.7, 4.8 and 4.9.

Figure 4.7: Building located near forest reserve in Maluku Ward in Industrial Division

Source: Field Research Findings 2011

Figure 4.7 shows a modern residential structure constructed at the edge of a forest reserve in Muluku ward in Industrial division. Thus encroaching on a portion of the forest reserve thereby turning the land use pattern from conservation to residential in Mbale municipality.

Figure 4.8: Maize gardens in formerly Maluku Public Open Space in Industrial Division

Source: Field research findings 2011

Figure 4.8 was previously open public space whose function was originally for holding public functions like official gathering and sports. However, these places have become irrelevant due to increased demand for land

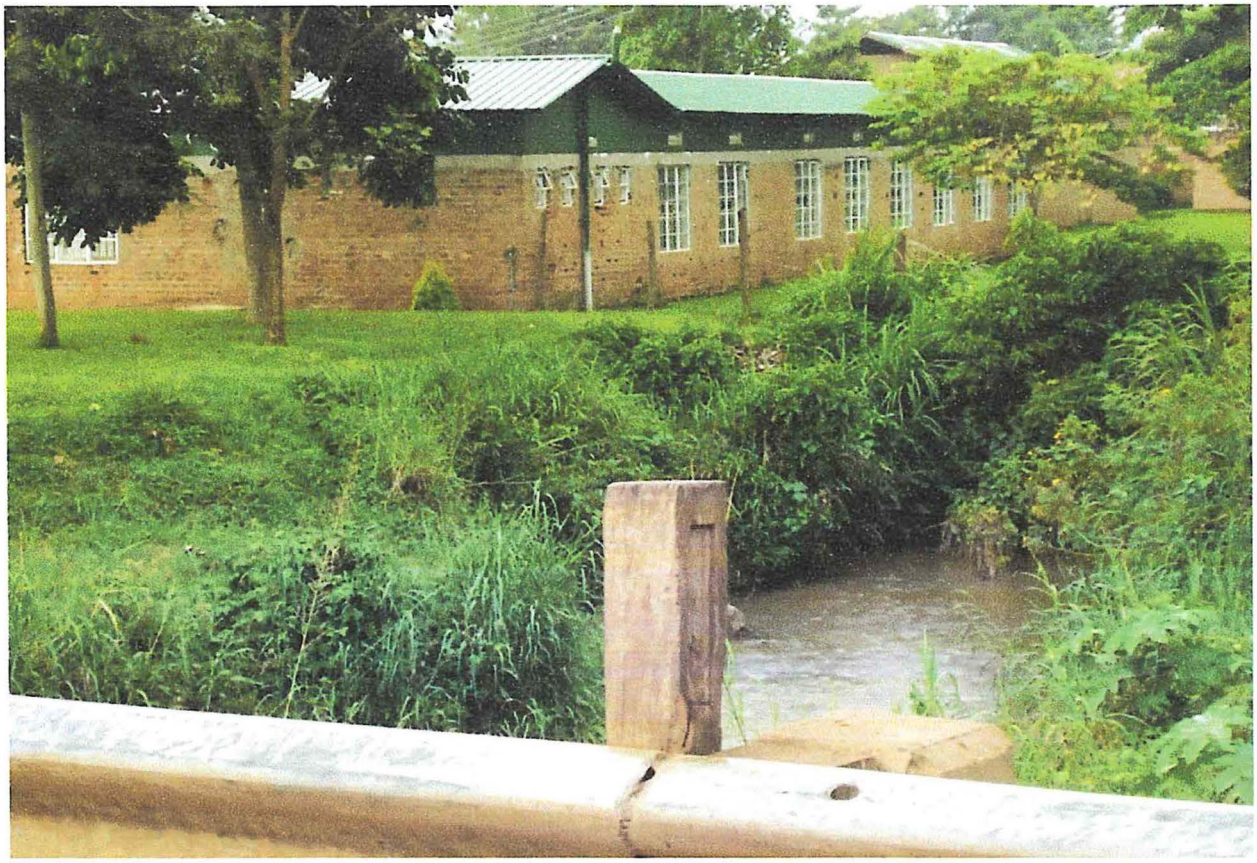


Figure 4.9: Building along Nabuyonga river bank (Encroachment on open spaces)

Source: Field research findings 2011

With reference to Tables 4.9 and 4.10; Figure 4.9 shows buildings/structures constructed along Nabuyonga river bank thus encroachment on open spaces mainly due to socio-economic factors like population pressure on land, and laxity in implementing urban land use zoning regulations.

A further survey was undertaken in Indian Quarters in Industrial Division to ascertain the number of residences that have been turned into other functions like commercial and administrative as indicated in Table 4.4.

Table 4.4: Number of residences that have been turned into other functions in Indian Quarters in Industrial Division

Change in Functions	Frequency Distribution	Percentage %
Residences that have been maintained	181	81
Residences to commercials	30	14
Residences to administrative offices	12	5
Total	**223**	**100**

Sources: Field Survey 2011

From Table 4.4, it can be seen that (81%) of residential houses have maintained their functions as residences, 14% have been turned into commercial, (5%) have been turned into administrative offices mainly for local and group NGOs. According to the structure plan 1954 drawn by the colonial government, and 1997 Mbale strategic development plan in Figures 4.25 and 4.26. Indian Quarters was gazetted as medium density residential area mainly for the Indian community. Therefore, changes in the functions of residences to commercial activities like schools, guest houses, hotels, shops and administrative offices, for example, Security Ltd Mbale Regional office Plot 3, Division administrative office, Micro-Finance Support Centre Ltd Mbale General office, AIDS Information Centre office Mbale Branch among others signify land use changes in Mbale Municipality thus affecting land use patterns. Figure 4.10 shows a residential house in Indian quarters in Industrial division that has been turned into commercial. This area was previously purely a residential area for the Indian community.

Figure 4.10: Residence which has been turned into commercial block in Indian Quarters Industrial Division.

Source: Field Research Findings 2011

Figure 4.10 shows an Indian building which was formerly used for residential. After the expulsion of Indians the building was taken over by Africans. Currently it is being used mainly for commercial purposes like dispensary, super market to cater for the high demand of goods and services in the area due to increased population. Hence turning the land use pattern from residential to commercial.

4.1.4 Previous and current land use patterns in Wanale Division

Wanale Division is made up of Boma Ward (Senior Quarters), Mooni and Busmaga Wards. With reference to the previous land use map of Mbale in Figure 4.1 the following previous land use patterns have been identified in Wanale division as described below. Wanale division was previously zoned mainly for low density residential in Senior Quarters in Boma ward. Farming was observed around residential areas in Senior Quarters, Schools like Fairway primary School in

Senior Quarters, Busamaga Primary School in Busamaga, Hotels like Mount Elgon Hotel, and recreational facilities/centres like Mbale Sports Club in Senior Quarters were observed. Slums of wattle old buildings were seen in Busamaga and Mooni. This is an indication that this area was previously residential. For example photograph in Figure 4.11 was taken from Senior quarters in Boma ward in Wanale division showing a low density residential settlement.

Figure 4.11: Low density residential settlement in Senior Quarters (Boma Ward in Wanale Division)

Source: Field Research Findings 2011

Figure 4.11 shows a low residential settlement in Senior quarters. Land use in this area has mainly remained residential despite the emergence of commercial and administrative functions in form of hotels and offices.

A question was posed to the residents of Wanale Division about the major uses of their areas/land and the following responses were given as follows. About 29% said they use their area/land for commercial, 54% use their area/land for residential and 17% for both residential and commercial. This information was presented in a pie-chart form as seen in Figure 4.12

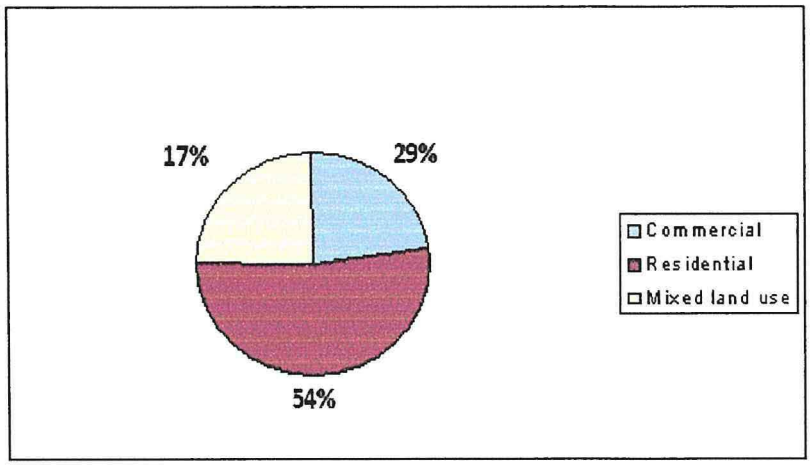


Figure 4.12: Percentage of major activities in Wanale Division

Source: Field Data 2011

According to Figure 4.12, it can be observed that a big percentage of the respondents (54%) concurred that they use their area/land for residential purposes while a small percentage (29%) use their land for commercial purposes. Another (17%) said they use their area/land for both commercial and residential purposes. Since (54%) is a large percentage indicating that much of the area is basically for residential purposes. This argument is also in line with Balchin et al (2000) that residential functions cover the largest areas and forms the citizen's surroundings for a large population of the day as it covers 43% of most urban areas. Residentials are particularly important because human activities have a co-relation to residences. In the long run it affects land use patterns in Mbale Municipality.

With reference to the previous and current zoning, land use maps of Mbale in Figures 4.1 and 4.2 respectively when compared, Wanale division was previously a residential area for residential purposes. Senior quarters in Boma ward was previously gazetted as a low density residential area for mainly government officials, while Mooni and Busamaga for high density residential. Currently there are some changes in land use patterns in Wanale division.

In Wanale Division, new commercial, administrative and recreational centres are on the increase. Commercial buildings are being erected in the areas which were meant for residences. The case in point is Senior Quarters, in Boma Ward, for example, Mbale Resort Hotel, Kayegi Hotel among others. In Busamaga Ward, there was also construction of modern houses alongside old wattle buildings. Mooni and Busamaga Wards have become commercial centres, for example, Busamaga Trading Centre. Senior Quarters which was purely a residential area has been turned into commercial and administrative with emerging of new activities where people have bought

houses from the council and turned them into commercial and administrative centres. An example of a residential building that has been turned into an office in Senior quarters in Boma ward in Wanale division in Figure 4.13.

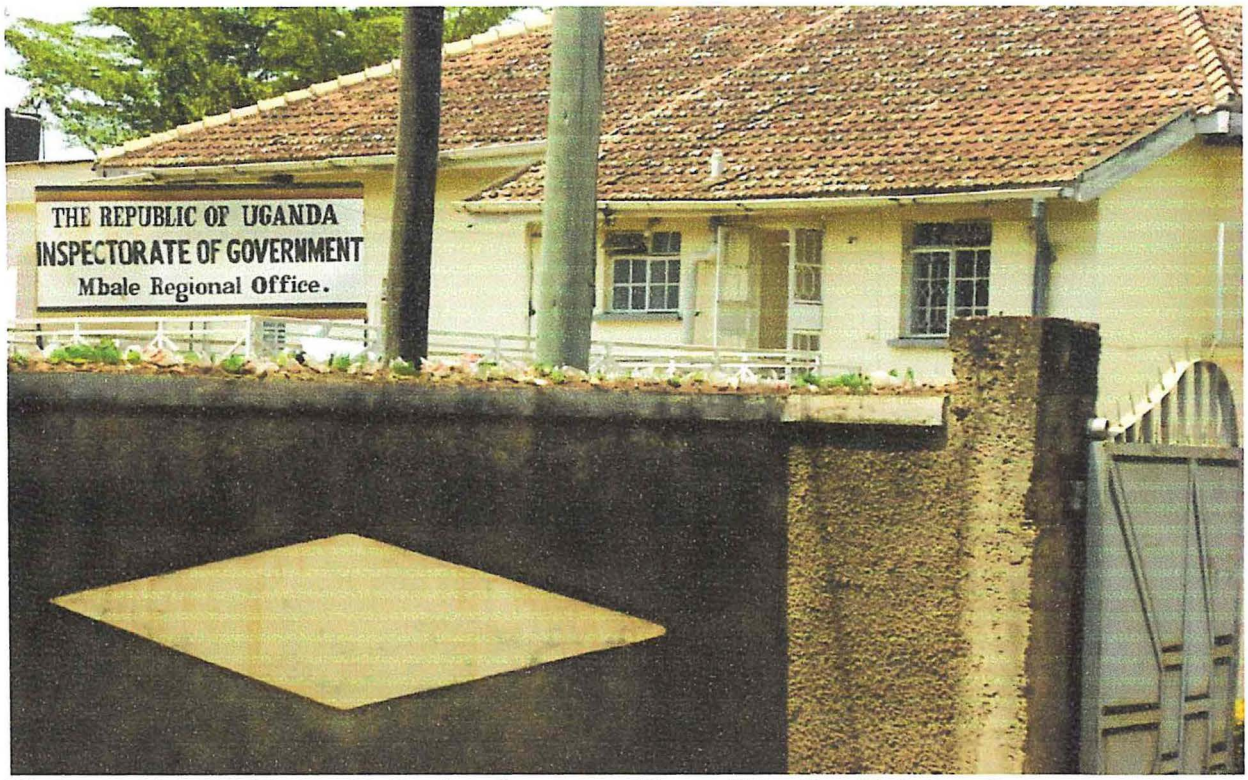


Figure 4.13: Residence in Senior Quarters (Boma Ward) which has been turned into an office

Source: Field Research Findings 2011

Figure 4.13 shows a residential house that has been turned into office space, thus causing changes in land use patterns over the area.

A survey was further undertaken in Senior Quarters in Wanale Division to ascertain the number of residences that have been turned into commercial, offices and recreation along three lanes, that is, along Masaba Lane, Bunkoko Lane, and Wanale Lane. This was presented in Table 4.5.

Table 4.5: Number of residences that have been turned into other functions in Senior Quarters in Wanale Division

Change in Functions	Frequency Distribution	Percentage %
Maintained as residences	126	67
Residences to commercials	32	17
Residences to administrative offices	27	15
Residences to recreation	1	1
Total	186	100

Sources: Field Survey 2011

From Table 4.5, it can be seen that majority of the premises (67%) have been maintained as residences, 17% of the residences have been turned into commercial mainly as schools, hostels, guest houses, for example, Friends Inn Plot 49 Wanale Road, Sunrise Inn, Botanical Gardens Guest House Plot 7 Bunkoko Road, Rainbow Nursery School among others. About 15% of the residences have been turned into administrative offices for both government and NGOs, for example, Office of IGG, World Vision Regional Office, Amnesty Commission Eastern Region Plot 42B Masaba Road. USAID American people Eastern Region office Plot 43A, Saraceen (U) Ltd office, Mission Moving Mountains Plot 31 Wanale Road among others, while only 1% has been turned into recreation. However, the recreation function has been maintained at Sports Club and Cricket Ground. Senior Quarters according to structure plans of 1954 and the 1997 in Figures 4.25 and 4.26 was gazette as high class residential area mainly for top government officials.

Therefore, emergence of commercial and administrative institutions in houses formerly meant for residences signify that there are changes in land use patterns in Mbale Municipality. This is in line with Waugh (2000) who noted that in a free market, the highest bidder obtains the use of land. In towns competition for land use is highest in the city centre due to accessibility and shortage of space, supermarkets, banks, and communication centres dominate the town centre and Non-governmental organizations have occupied residential houses as offices. Figure 4.14 is an example of a residential house in Senior quarters in Wanale division that has been turned into an office.

Figure 4.14: Residence that has been turned in an office in Senior Quarters in Wanale Division.

Source: Field Research Findings 2011

Figure 4.14 is a residential building that has been turned into an office located on a gentle slope in a low population density area. This gives rise to mixed land uses in the area.

4.1.5 Previous and current land use patterns in the Central Business District

The Central Business District comprises of mainly South Central Ward in Industrial Division and part of North Central Ward in Northern Division. With reference to the pattern of previous land use map of Mbale 1994 in Figure 4.1 and the current land use map of Mbale in Figure 4.2. This area comprises of the CBD which is a built-up area. Previously before 1995 up to current (2012), the CBD is mainly used for commercial activities. It is composed of majorly old buildings of Indian style and architecture. The buildings bear years before 1995, for example a keen study along Republic Street in North Central Ward from Clock Tower (Centre of the Town) up to High Court which is approximately 200 metres. It was observed that out of 49 buildings only two buildings were current and of modern style built with modern quality materials for example Masaba hilltop hotel while the rest were old Indian buildings bearing Indian style and architecture constructed from old bricks using soil mixed with sand having old iron sheets. The buildings contain shops in front and behind were stores an indication that this area was previously commercial. Photograph in Figure 4.15 illustrates old developments along modern developments in the CBD in Mbale municipality indicating that this area was previously zoned for commercial purposes.

Figure 4.15: Buildings along Bishop Wasikye Road in South Central Ward in Industrial Division

Source: Field Research Findings 2011

With reference to the previous and current zoning land use maps of Mbale in Figures 4.1 and 4.2 when compared, the CBD is a built up area which has mainly remained a commercial area.

Even the current modern structures coming up in the CBD are for commercial purposes. These structures are in form of supermarkets, shopping arcades and malls, modern hotels and lodges for example Masaba Hilltop hotel on Republic street, BAM shopping centre on Naboa road, Mbale shoppers on Palisa road among others. An example of a photograph in Figure 4.16 was taken to illustrate some of the current buildings/structures which have come up in the CBD.

Figure 4.16: Modern building along Republic Street in the Central Business District reflecting current developments.

Source: Field research findings 2011

A survey was undertaken along Naboa Road from Upland Building up to Dr. Netuwa Maternity Health Centre Building a distance of about 150 metres. It was observed that out of 51 buildings on both sides of Naboa Road, only 4 buildings were current, for example, BAM Shopping Centre. The remaining buildings were old and of Indian style used for commercial shops and stores. The upstairs were used as lodges, hotels and bars. This information is presented in Table 4.6

Table 4.6: Functions of houses along Naboa Road in CBD

Functions	Frequency Distribution	Percentage %
Commercial shops and lodges/bars	21	41
Commercial shops and rentals	25	49
Purely residential	5	10
Total	**51**	**100**

Source: Field Survey 2011

The information in Table 4.6 indicates that buildings along Naboa Road in the Central Business District are majorly for commercial.

Previous and current land uses in Mbale Municipality differ from division to division. There is generally mixed up land use patterns in all the divisions. Zoning has been generally affected as land use is not as per the 1954 and 1997 urban structure plans. Thus between 1995- 2012 the physical characteristics of the land in relationship to land use has become unpredicTable and these new land use patterns have distorted the relationship between the land and land use categories. The new land use changes are in relation to mainly multiple nucei model of Harris and Ullman (1945).This is because the new land use changes have occurred mainly at the periphery of the town where several suburbs like Nkoma, Namatala, Mooni among others are being turned into mainly commercial centres and will soon merge to form one town (Great Mbale). This is in line with NEMA (2009) that the suburbs of Kampala city are experiencing rapid urbanization leading to the development of satellite towns around the city. Current trend indicates that, these satellite towns may be merged into present Kampala to form the Metropolitan Kampala and towns likely to be absorbed include: Mukono, Entebbe, Kiira, Namungona, Bweyogerere and Kyengera among others.

4.2 Examination of the underlying causes and effects of the changing urban land use patterns in Mbale Municipality since 1995

This study was meant to establish the factors/causes of the changing urban land use patterns in Mbale Municipality since 1995. The factors that were examined in this research included; Government Policy, socio-economic factors like land tenure systems, urban expansion and physical factors like relief, drainage, soils among others.

4.2.1 Physical Factors

Physical factors refer to the natural conditions in a given environment. They include; relief, climate, drainage, soils, vegetation among others. Those included in this research are relief, drainage and type of soil.

4.2.2 Relief

The aim of this study was to examine the underlying causes of the changing urban land use patterns in Mbale Municipality since 1995. Relief refers to the general appearance of the land scape like the nature of slope. Relief is one of the physical factors that influence land use in Mbale municipality. The relationship between relief and land use in Mbale municipality has been summarized in Table 4.7.

Table 4.7: Relationship between relief and settlements in Mbale municipality

Nature of relief	Industrial Division		Wanale Division		Northern Division		Total No. of Settlements	Total %
	No. of Settlements	%	No. of Settlements	%	No. of Settlements	%		
Gentle slope	28	58.3	24	92.3	23	88.5	75	75
Lowland/flat	20	41.7	2	7.7	3	11.5	25	25
TOTAL	**48**	**100**	**26**	**100**	**26**	**100**	**100**	**100**

Source: Field data 2011

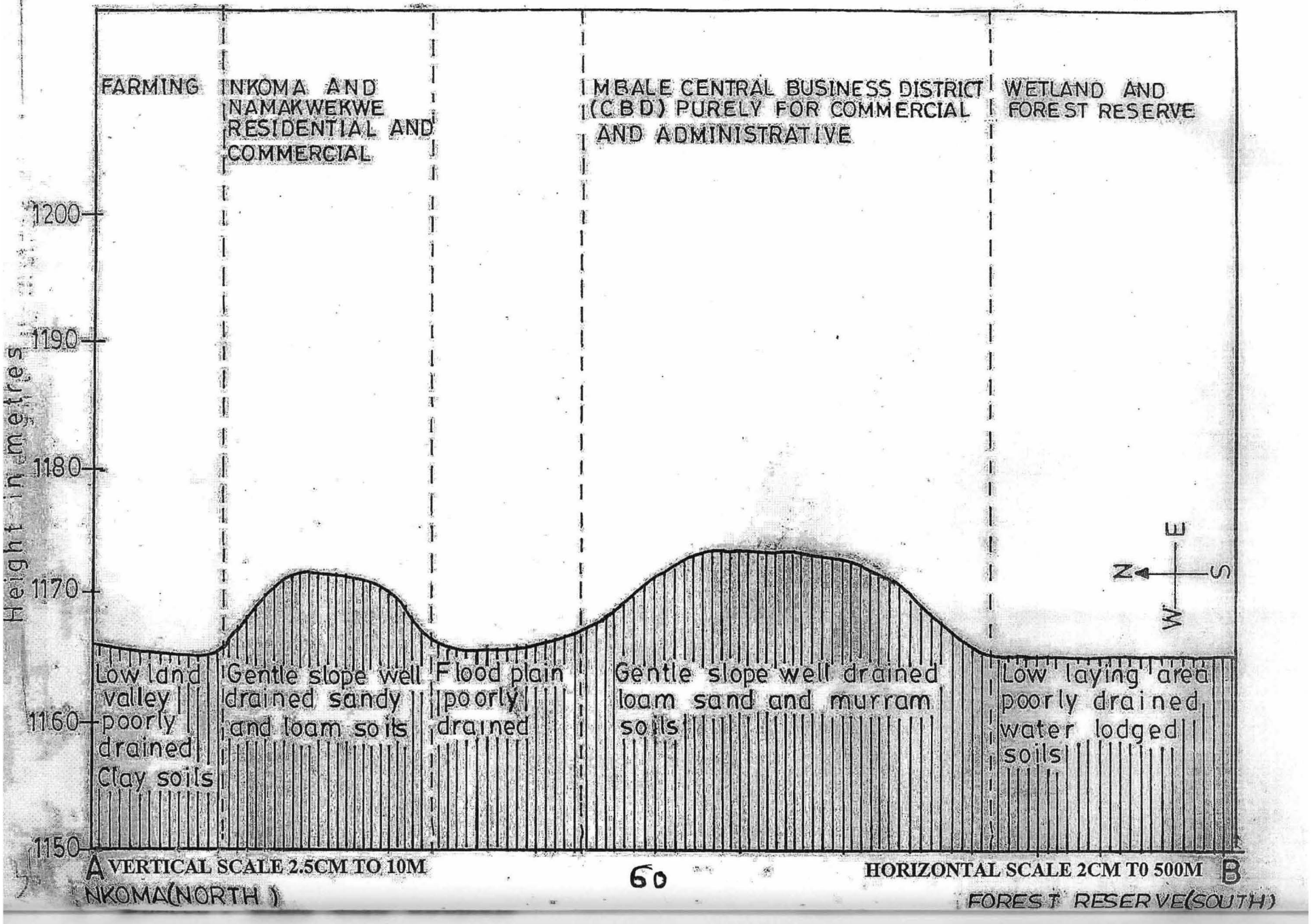
According to Table 4.7, it was observed that a large percentage (75%) of the commercial, residential and industrial settlements were located on gentle slopes while a small percentage (25%) of commercial, residential and industrial settlements were located on flat land. This was observed in all the three divisions of Industrial, Wanale and Northern. The gentle slopes are well drained compared to the low land areas and valleys which are poorly drained to support residential, industrial and commercial settlements. With reference to a transect drawn across

Mbale Municipality from Nkoma up to Mbale central forest reserve in Figure 4.17 indicates how relief determines land use. This seems to agree with Vestappen (1983), who argues that the general layout of settlements and the situation of major functional zones such as residential, services and industrial areas are normally governed to the large extent by matters of relief where the general characteristics of urban structure reflect availability of flat or gently sloping land.

This can be seen on the top hill and the slopes of Nkoma hill where IUIU and school of hygiene are found. Towards Nabuyonga River the area is a flood plain (Kikyafu) susceptible to flooding (poorly drained). Across it to Industrial Division, up to Namatala, the area was not settled before 1995. From Nabuyonga into Indian Quarters which is located on another slope and towards the top hill, it is well built with both social institutions and residential houses.

From the cross section in Figures 4.17, it can be seen that relief has significant relationship with land use. Residential, commercial, administrative and industrial settlements like the Central Business District and suburbs of Namatala, Namakwekwe, Maluku, Nkoma and Mooni are located in gently sloping and flat areas. While lowland areas are occupied by wetlands and forest reserves, for example, Mbale Central Forest Reserve in Southern part of the Municipality in Maluku ward. See Relief Cross Section of Mbale Municipality drawn from Nkoma valley (North) up to Mbale central forest reserve (South) in Figure 4.17.

FIGURE 4.17 RELIEF CROSS SECTION OF MBALE MUNICIPALITY FROM NKOMA (NORTH) UP TO MBALE CENTRAL FOREST RESERVE (SOUTH).



4.2.3 Relationship between soil type and land use in Mbale Municipality

The aim of this study was to examine the underlying causes of the changing urban land use patterns in Mbale Municipality since 1995. The type of soil in an area influence land use as it is closely related to the nature of relief. At different slopes different types of soils are found and this in turn has an influence on land use types in a given area. In low lying areas/valleys, soils are clay in nature and water logged supporting the growing of water logged crops like rice, as observed in Nkoma valley and for conservation. Gentle slopes contain sandy loam soils, and clay sandy soils. These support residential, commercial and institutional activities among others. As observed on the gentle slopes of Namakwekwe in Northern division and Maluku in Industrial division.

This is in line with Vestappen (1983), a third group of physical factors affecting urban planning and construction relates to soil and sub-soil conditions. The engineering properties of the soil and sub-soil materials such as bearing strength are especially critical where heavy, multi-storey structures have to be erected or in locating industries if foundation problems have to be avoided. This argument is further strengthened by an article by Gilbert A. "Building a firm foundation" in the New Vision of 5th February 2011 page 31, "the type of soil on which construction site is, dictates the materials used to set the foundation. For instance, water logged soils cannot effectively provide support for the house and therefore require a strong foundation provided by a thick wall with hardcore". The nature of soils used to influence land use types before 1995, however with reference to table 4.12 the current land use changes in Mbale Municipality can be explained by other factors which are socio-economic like population increase, land tenure systems, political influence among others.

4.2.4 Relationship between drainage and land use in Mbale Municipality

The aim of this study was to examine the underlying causes of the changing urban land use patterns in Mbale municipality since 1995.

Drainage refers to the distribution of water features such as rivers, streams and swamps, among others. Drainage influence land use in an area as it is also closely related to the nature of relief. The relationship between drainage and land use in Mbale municipality has been summarized in Table 4.8.

Table 4.8: Relationship between drainage and settlements in Mbale municipality

Drainage	Industrial Division		Wanale Division		Northern Division		Total No. of Settlements	Total %
	No. of Settlements	%	No. of Settlements	%	No. of Settlements	%		
Well drained	45	93.8	17	65.4	21	80.8	83	83
Poorly drained	3	6.2	9	34.6	5	19.2	17	17
TOTAL	**48**	**100**	**26**	**100**	**26**	**100**	**100**	**100**

Source: Field data 2011

From Table 4.8, it can be observed that a big percentage of homesteads, commercials and industrial settlements (83%) were located in well drained areas while a small percentage of homesteads, commercials and industrial settlements (17%) were located in poorly drained areas like wetlands and water logged areas.

Areas with high water retention are referred to as poorly drained areas or areas with impended drainage. Areas with low water retention are referred to as well drained areas. With reference to the Mbale relief Map in Figure 3.2 and, a transect which was drawn across Mbale from Nkoma valley up to Mbale central Forest reserve as seen in Figure 4.17 clearly indicate the influence of drainage on land use.

Drainage has an influence on land use in Mbale Municipality in that low lying areas which are poorly drained are for conservation while areas which are on gentle slopes and well drained support residential, commercial, institutional activities among others. For example, Doko cell in Namatala ward in Industrial Division, Nashibiso flood plains in Maluku in Industrial Division, Busamaga along Nabuyonga River valley in Wanale Division are poorly drained areas and were meant for conservation though currently they have been encroached upon for residential and and commercial settlements as observed in some areas of Maluku and Namatala wards in Industrial division.

Well drained areas on gentle slopes support residential, commercial and Industrial settlements; among others. For example the Central Business District is located on a gentle slope which is largely for commercial, residential and administrative purposes. Examples of settlements located in poorly drained areas as seen in Figures 4.18 and 4.19.

Figure 4.18: Buildings located in wetland areas along Nashibiso River in Maluku Ward in Industrial Division

Source: Field Research Findings 2011

Figure 4.18 shows buildings constructed in a poorly drained area in Maluku ward in Industrial division. Thus encroachment on open spaces and conservation areas. Buildings located in poorly drained areas are of poor quality as seen from Figure 4.18 as compared to those located in well drained areas.

Figure 4.19: A school built in a wetland in southern part of Mbale Industrial Division

Source: Field research Findings 2011

Figure 4.19 shows the school located in a poorly drained area (wetland) indicating the level at which wetland areas are being encroached upon in Mbale Municipality.

The encroachment on wet land areas begun after 1995

4.2.5 Socio-economic factors

The aim of this study was to examine the factors influencing the changing urban land use patterns in Mbale Municipality since 1995.

Socio-economic factors refer to human aspects like population size, culture and customs, religion, society objectives, needs, goals and aspirations, capital, demand for goods and services among others. Socio-economic factors in this study included population size, land tenure systems, urban expansion due to increased demand for goods and services and political influence. The residents in the area were interviewed under research question two about how land was acquired in the area and the following responses were given, 69% said they bought land from Council, , 17% said they inherited the land while 14% said they rent the premises where they stay or use for business. This information has been summarized in Table 4.11.

Table 4.9: Acquisition of land/plots in Mbale municipality.

	Industrial Division		Wanale Division		Northern Division		Total No. of residents	Total Percentage %
Way land was acquired	**No. of Residents**	**percentage**	**No. of residents**	**percentage**	**No. of residents**	**percentage**		
Bought from Council	36	75	16	61.5.	17	65.4	69	69
Inherited	4	8.3	6	24	7	26.9	17	17
Rent	8	16.7	4	15.4	2	7.7	14	14
TOTAL	**48**	**100**	**26**	**100**	**26**	**100**	**100**	**100**

Source: Field data 2011

With respect to Table 4.9, it can be seen that a big percentage of respondents (69%) bought land from Council, 17% inherited and 14% rent. Majority of the people individually purchased land implying that they could have bought land which is meant for other purposes like recreation, industrial and commercial activity hence interfering with the Mbale structural plan

This is an indication that land tenure system (ownership of land) is private. Thus one can decide to use the land in his own way to set up any activity regardless of the structure plan put in place and land use regulations. This is in accordance to Mbale Municipal Local Government three year development plan (2009/2010 to 2011/2012), modern buildings, containers and slums or shanties have been left to develop in their own way side by side as the Public Health Act 1964 and Town and Country Planning Act are not being enforced. Overpopulation and land shortage is forcing people to encroach on flood plains and public land for recreational purpose, road reserves, public buildings and drainage channels. Examples of photographs in Figures 4.20 and 4.21 show buildings constructed in areas meant for other purposes.

Figure 4.20: Building under construction at Mbale Bus Park in South Central Ward in Industrial Division

Source: Field Research Findings 2011

Figure 4.20 shows structures at Mbale Bus Park along Mbale –Tororo high way round about in South central ward in Industrial division constructed in a road reserve. Thus encroachments on road reserves thereby affecting land use patterns in Mbale municipality.

Observation on ground with reference to the current land use Map of Mbale in Figure 4.2 indicated that land use changes have occurred in the three Divisions of Northern, Industrial and Wanale especially at the periphery of the Municipality. In Nkoma, Namakwekwe and Nabuyonga Wards in Northern Division new commercial buildings have come up in residential areas. In Industrial Division in Maluku and Indian Quarters commercial and administrative structures have come up in such areas which were purely meant for residential in form of hotels, guest houses, markets, hostels among others. In Wanale Division in Senior Quarters which was purely residential area mainly for government officials has now been turned into commercial with emerging of new activities where people have bought houses from the Council and turned them into commercial and administrative centres, for example, Kayegi Hotel, Sunrise Inn among others.

Figure 4.21: New recreational centre in Senior Quarters in Boma Ward in Wanale Division.

Source: Field Research Findings 2011

Figure 4.21 is a current recreational structure that has been put up in Senior quarters (Boma ward in Wanale division). Emergence of recreational structure in Figure 4.21 in Senior quarters which is meant for purely high class residential indicates that there are changes in land use patterns from residential to mixed-up land use patterns in Mbale municipality.

4.2.6 Government Policy

The aim of the study was to examine the underlying causes of the changing urban land use patterns in Mbale Municipality since 1995.Government policy refers to government decisions in form of political forces and economic considerations by both local and central government to provide public utilities. Government policy to provide social services to the people through both local councils and central government has affected land use patterns of urban centres in Uganda and Mbale in particular. With reference to the Table 4.9, it can be observed that 69 percent of the residents agreed that they purchased land from the council, 17 percent inherited the land and 14 percent just rent. Since the majority (69%) accepted that they bought land from the council, implying that government has an influence on the changing urban land use patterns in Mbale Municipality. This is in agreement with Badcock (2002), that political forces in form of government decisions especially to provide public utilities influence change in land use patterns.

4.2.7 Effects of the changing urban land use patterns in Mbale Municipality since 1995 on the physical environment

This study was also meant to establish the effects of the changing urban land use patterns in Mbale Municipality since 1995 on the physical environment. The effects that were established in this research included: Encroachment on marginal lands like forest reserves and wetlands and loss of farmland to urban expansion, land use conflicts and unplanned settlements. The analysis to this part of objective two which reads, "to examine the underlying causes and effects of the changing urban land use patterns in Mbale Municipality since 1995," was presented, analyzed, interpreted and discussed following the questions respondents were asked under this objective and observations made by the researcher on ground with reference to the Mbale urban structure plans of 1954 and 1997 in Figures 4.25 and 4.26. For instance a question was put to the residentials, commercials and Industrialists about the effects for the emerging of settlements in the area. The following responses were given 48% said encroachment on marginal land, 22% gave loss of farmland, 20% said land use conflicts and 10% said unplanned settlements. This information was transformed into Table 4.10 for proper clarification.

Table 4.10: Effects of emerging settlements on land use patterns in Mbale Municipality

	Industrial Division		Wanale Division		Northern Division		Total No. of Settlements	Total Percentage %
Effects	**No. of Settlements**	**percentage**	**No. of Settlements**	**percentage**	**No. of Settlements**	**percentage**		
Encroachment on marginal land	18	37.5	15	57.7	15	57.7	48	48
Loss of farmland	14	29.2	4	15.4	4	15.4	22	22
Land use conflict	11	22.9	6	23.1	3	11.5	20	20
Unplanned settlements	5	10.4	1	3.8	4	15.4	10	10
TOTAL	**48**	**100**	**26**	**100**	**26**	**100**	**100**	**100**

Source: Field data 2011

According to Table 4.10, 48% of the respondents agreed that emergence of new settlements have affected land use patterns by encroaching on marginal land. About 22% accepted that it has led to loss of farmland. Another 20% admitted that it has led to land use conflicts and the minority (10%) were of the view that it has led to unplanned settlements. Since 48% is the majority, then it can be inferred that settlements have significantly affected land use patterns by encroaching on marginal lands. This was observed in all the three Divisions of Mbale Municipality. In Northern Division marginal lands in form of wetlands, open spaces and land for pre-urban agriculture had been encroached on, for example, IUIU primary is located in a wetland and there are buildings in road reserves. Ahamadiya Muslim Hospital is located near a forest reserve. Schools such as Oxford High School, Kings Education Centre, Mbale Comprehensive, Hamdan Girls High School, are allocated adjacent to forest reserve and in a former wetland area. The photographs were taken from the area as evidence to the above information in Figures 4.22, 4.23, 4.24,

Figure 4.22: Schools and homesteads encroaching on wetland areas and forest reserve in Maluku Ward in Industrial Division.

Source: Field Research Findings 2011

All the area in Figure 4.22 which is adjacent to Mbale central forest reserve according to the structure plans of 1954 and 1997 in Figures 4.25 and 4.26 was conserved as a wet land. But now settlements are encroaching on the area.

Figure 4.23: Unplanned settlements (Shaba Slums) in Maluku Ward in Industrial Division.

Source: Field data 2011

The structures in Figure 4.23 are examples of unplanned settlements in Mbale Municipality because they are found in a wet land and adjacent to the forest reserve which area according to the urban structure plans of 1954 and 1997 in Figures 4.25 and 4.26 was meant for conservation. The buildings as seen in Figure 4.23 are of poor quality and sub standard.

Figure 4.24: Maize Gardens around An industry in Namatala ward in Industrial division

Source: Field research findings 2011

As seen in Figure 4.24 and with reference to the Mbale urban structure plans of 1954 and 1997 in Figures 4.25 and 4.26, observation on ground further indicated that urban expansion has taken up land which was formerly meant for industrial location in areas like Namatala. For example farming and commercial activities have encroached on industrial land.

4.3 The relationship between current urban land use and Mbale urban structure plans/schemes of 1954 and 1997

A structure plan is a drawn document indicating the allocation of land uses in an area by right and general restrictions. The information generated from oral interviews/interview guides to the planners and secondary sources like "Mbale Municipality three year development plan 2009/2010 to 2011/2012," indicated that Mbale has an old structure plan that specifies land uses according to various zones but the plan needs to be revised because it was drawn by colonial authorities who formulated it basing on racial segregation which ignored proper development of land. See the 1997and 1954urban structure plans in Figures 4.25 and 4.26.

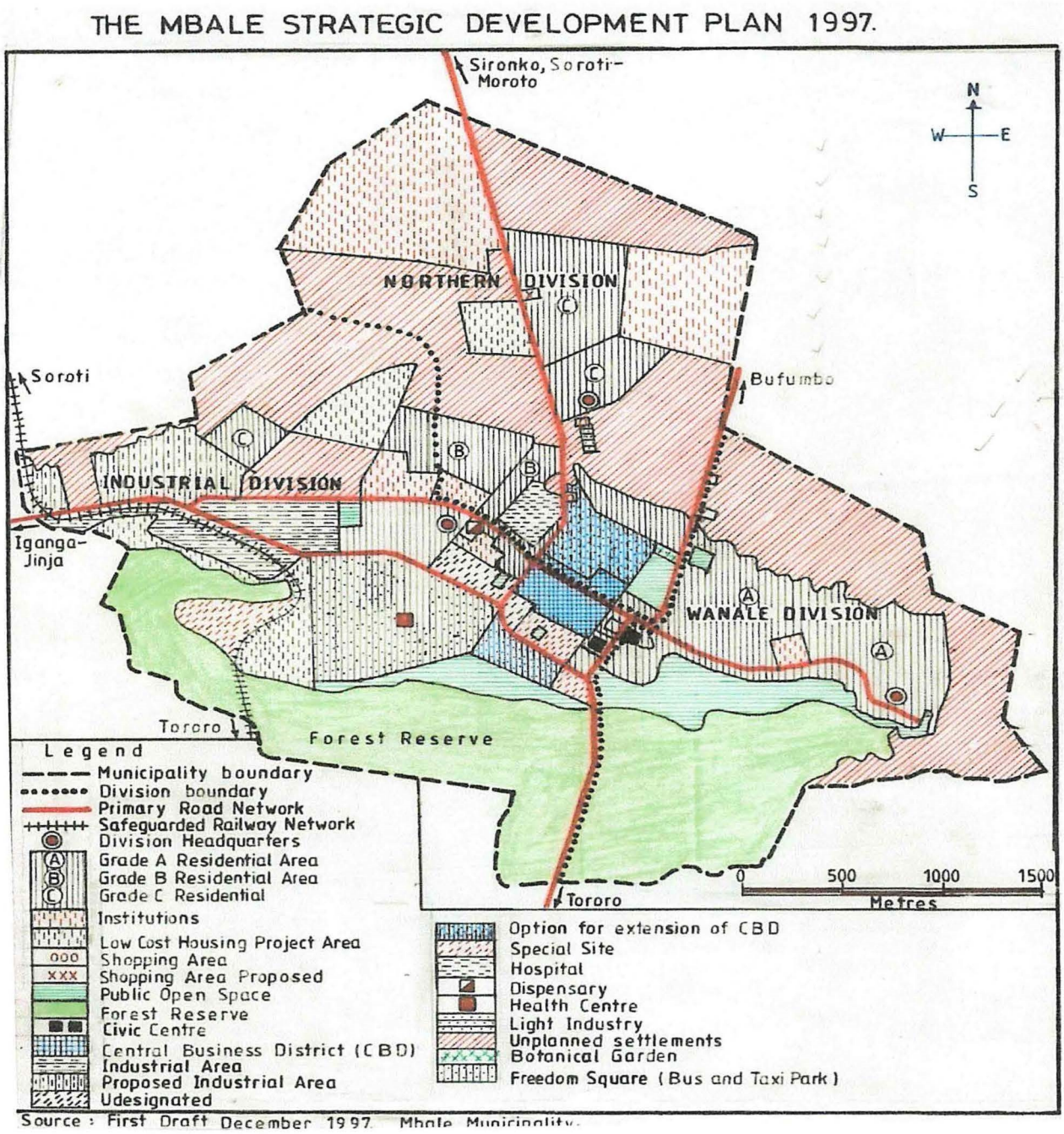


Figure 4.25: Mbale Strategic Development Plan 1997

Source: Mbale municipal physical planning unit

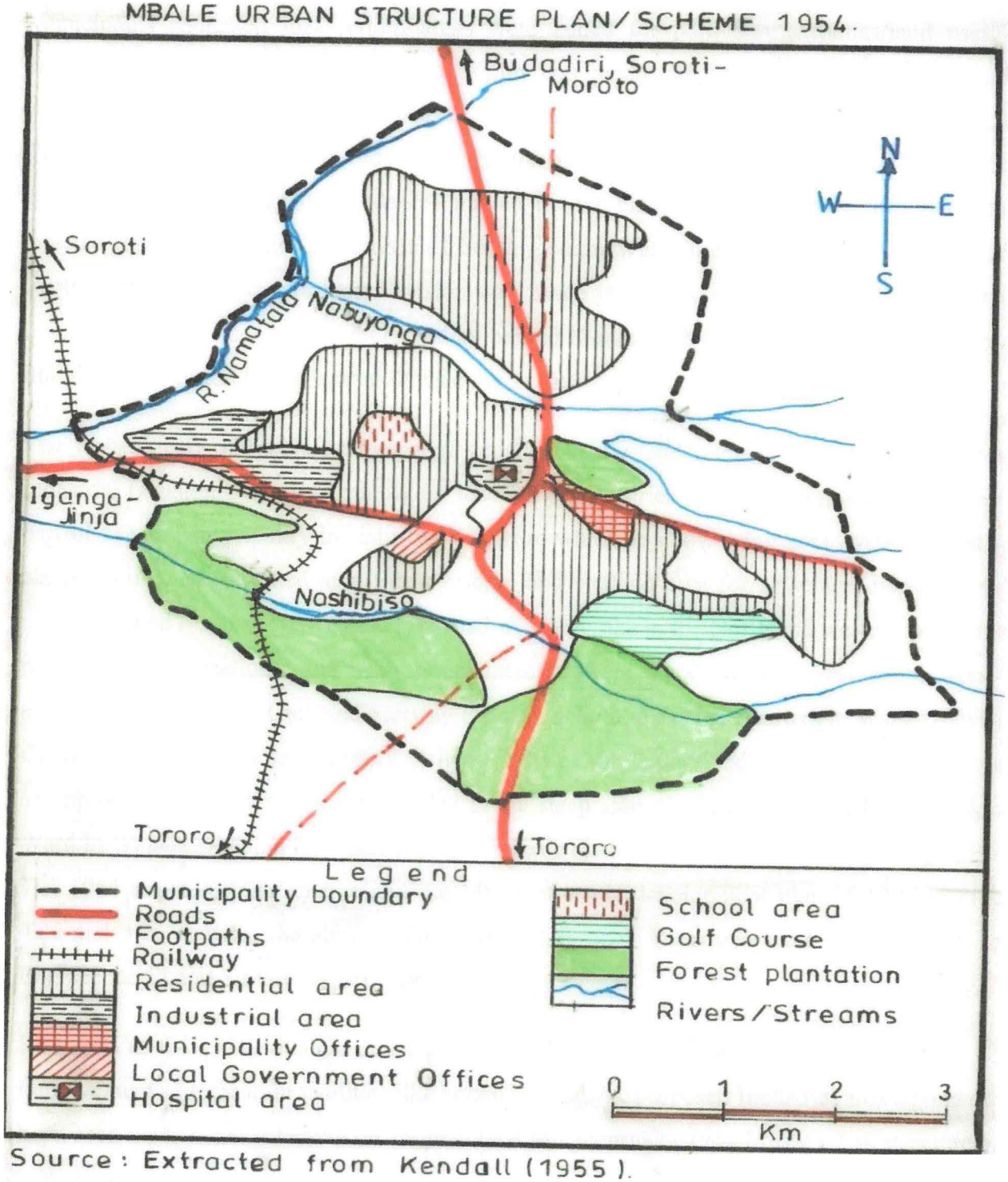


Figure 4.26: Mbale Urban Structure Plan/Scheme 1954

This is in conformity with Kendall (1955) who stated that Mbale structure plan/scheme was put in place in 1954. This structure plan/scheme for the town makes provision for widening of main roads leading to North and west and gazzetted areas for other activities/land uses like light industries, residences, commercials among others. Oral interviews and interaction with the

technical respondents like the Physical Planner, Town Engineer and Land Surveyor in Mbale Municipality indicated that certain areas were zoned for particular activities/land uses, for example, Senior Quarters in Wanale Division was meant for residential for the government officials, Indian Quarters in Industrial Division was the residential area for the Indian Community. Maluku Estate in Industrial Division and Namakwekwe Estate in Northern Division were zoned for high density residential mainly for the black workers. The centre of the town referred to as CBD which comprises of South Central Ward in Industrial Division and part of North Central Ward in Northern Division was zoned purely for commercial and administrative functions. Certain areas like Uhuru Valley behind Mbale High Court in Northern Division and Maluku Open Ground in Industrial Division were meant for public open spaces.

The western part of Mbale Municipality which is a low land referred to as Industrial Area in Industrial Division was zoned mainly for location of industries. The Southern and South western part of Mbale Municipality in Industrial Division which is a low lying area, water logged with clayish soils was gazzetted as a forest reserve and wetland area for sewerage disposal. Areas meant for road reserves were catered for road widening like in the North and western where major roads pass. Recreational and institutional facilities were incorporated in residential areas, for example, Mbale Sports Club and Fairway Primary School in Senior Quarters in Wanale Division. Children's Park, Agakhan Primary School, Mbale Municipal Stadium in Industrial Division among others. A water tank was located at the steep slope in Eastern part of Mbale in Mooni Ward in Wanale Division for water supply in Mbale town from Manafwa Water Supply at Busiu. The 1954 structure plan/scheme and the Mbale strategic development plan of 1997 in Figures 4.25 and 4.26 clarifies the above information got through interviews from the Planners, Town Engineer and Land Survey Department of Mbale.

However, in the 1997 strategic development plan some improvements like extension of CBD, improvement of recreation facilities like botanical gardens, proposed Industrial area among others have been made hence affecting the original land use patterns of 1954 Mbale urban structure plan.

Questions relating to this objective were asked in the questionnaire in addition to the interview guides to planners and observations made by the researcher on the ground. This is presented, in Table 4.11:

Table 4.11: - Residential houses/homesteads built according to plan in Mbale Municipality

	Industrial Division		Wanale Division		Northern Division		Tot No- of resp	Total %
Views of respondents	No of resp	%	No of resp	%	No-of resp	%		
Not according to plan	03	16.7	02	18.2	05	26.3	10	21
According to plan	15	83.3	9	81.8	14	73.7	38	79
TOTAL	18	100	11	100	19	100	48	100

Source: Field data 2011

According to Table 4.11, a big percentage of the respondents (79%) are of the view that their houses were built according to plan. The smaller percentage, (21%) agreed that they never built their houses according to plan. Since 79% is the bigger percentage, then it can be inferred that houses were built according to plan. The smaller percentage, 21% acknowledge that their houses were not built according to plan. This therefore means that there is planning on the ground as revealed by interviews from Physical Planner though elements of unplanned structures exist, which greatly affect land use patterns in Mbale Municipality. This is in agreement with Dwyer (1982) in his study in Nigeria who noted that the six year development plan of 1962 – 1968, housing appeared under general heading of town planning together with planning surveys, physical planning, land acquisition, land development, provision of utilities and construction of industrial estates. Thus construction has to go by plan, and it should be in areas gazzetted for such an activity. This can make dangers associated with the changing urban land use patterns to be overcome.

Observation on ground, with reference to the current Mbale land use Map in Figure 4.2, when compared with the 1954 and 1997 urban structure plans in Figures 4.25 and 4.26 that were drawn to guide land uses in the Municipality. However the changing urban land use patterns were not following the structure plans put in place. This has resulted into poor growth of the town and encroachment on marginal lands. Many activities have come up in the town without following any plan, for example, the upshot of new buildings at both the Taxi and Bus Park is an example of

unplanned construction in Industrial Division. Places meant to be parking yards have been taken over and construction has already taken root as seen in Figure 4.27

Figure 4.27: New constructions at Mbale Bus Park in South Central Ward in Industrial Division.

Source: Field Research Findings 2011

Figure 4.27 are structures found along Mbale-Tororo high way at the roundabout as you enter Mbale Bus Park in South central ward in Industrial division constructed in road reserve. These are some of the un planned constructions in Mbale municipality hence affecting land use patterns.

The respondents (business people) were asked whether they have intention to change their business. A total of 16 (53%) said they have intention to change their businesses while 14 (47%) said they have no intention to change their businesses. The results of this question were presented in graph form in Figure 4.28.

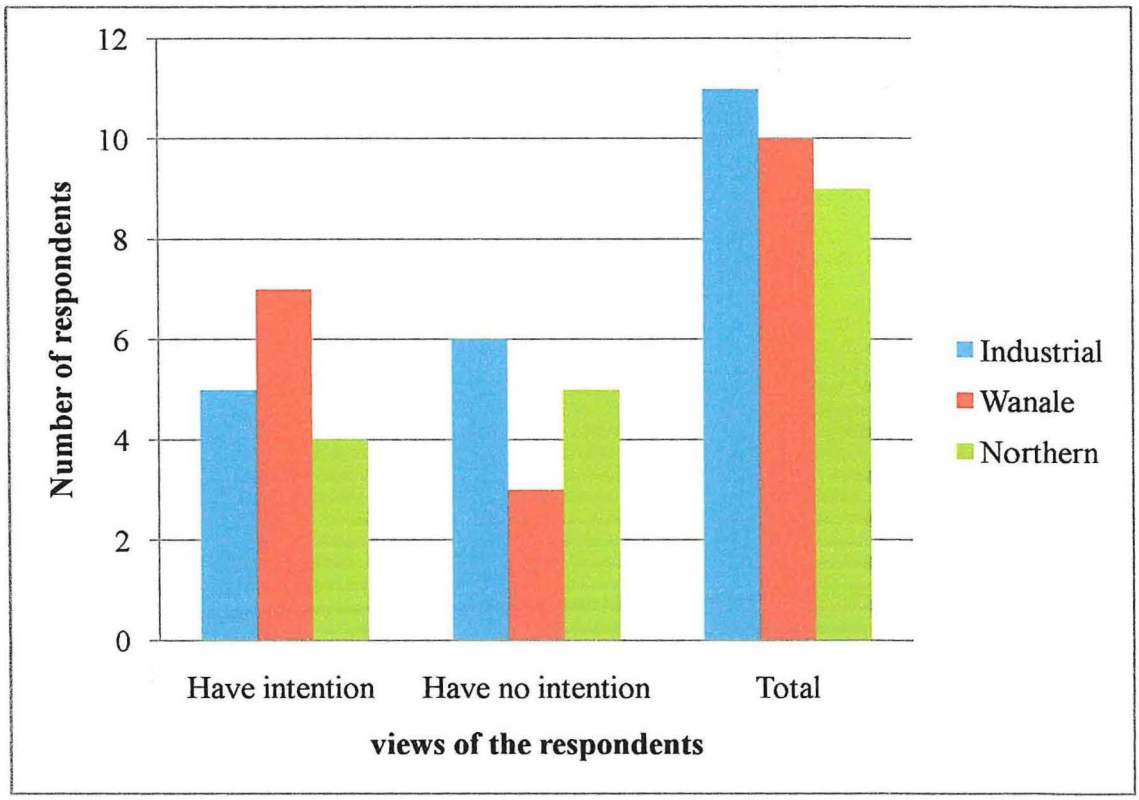


Figure 4.28: Intention of business people in Mbale municipality to change to other businesses

Source: Field data 2011

From Figure, 4.28 It can be observed that a big percentage of the respondents (53%) agreed that they have intention of changing their businesses. Therefore, this implies that land use patterns in Mbale Municipality are being affected as people keep on shifting from one activity to another without any control and regardless of the structure plan put in place. This observation concurs with Badcock (2002) that most of the activities in European and American cities have changed over time with development in production, transport and communication technologies, and shifts in patterns of consumption.

The respondents (industrialists) were further asked under this objective as to why industries are located where they are. Various responses to this question were given where 3 (14%) said industries were located due to enough land, 11 (50%) said due to availability of market, 5 (22%) said because it was an industrial area and 3 (14%) said because of easy transport (the presence of a rail line). These results are presented in Table 4.12.

Table 4.12: Reasons for location of industries in the area.

REASONS FOR LOCATION OF INDUSTRY	FREQUENCY DISTRIBUTION	%AGE
Enough land	3	14
Availability of market	11	50
An industrial area	5	22
Easy transport (rail line)	3	14
TOTAL	**22**	**100**

Source: Field data 2011

From Table 4.12, a half of the respondents (50%) confirmed that industries were located majorly because of market as a result of high population. Mbale town being a centre in the Eastern and Northern regions and a border town with Kenya linked with railway line from Mbale via Tororo to Kenya creates market for industrial goods. About 14% of the respondents confirmed that location of industries in the area was due to easy transport (rail line). This indicates that, socio-economic factors like, high demand for goods, market availability have a significant impact on the changing urban land use patterns in Mbale Municipality. And about 22% of the respondents confirmed that, industries were located because it was a gazzetted Industrial area for industries by the government. While 14% of the respondents confirmed that industries were located due to the availability of vacant or enough land which land could have been gazzetted for industrial purposes by the government? This also equally suggests that government has an upper hand in influencing the changing land use patterns and land uses in Mbale Municipality through gazzetting land for certain land uses. In another development, Aurther, (1978) points out that five Indian new towns and the re-planning of the decayed and congested town centers were expected to address the issue of orderly expansion and evolution of land use patterns.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5 Introduction

The objective of this study was to establish the factors influencing the changing urban land use patterns in Mbale Municipality since 1995.

This chapter presents recommendations based on the findings and areas of further study have been suggested at the end of this chapter. The researcher has also made conclusions basing on scientific investigation of the study.

5.1 Conclusions

Therefore, the following conclusions were drawn basing on the findings of the study:

The previous and current land use patterns that this study established in all the three divisions of Industrial, Northern and Wanale include: residential, commercial administrative, institutional, recreational, industrial, public open space, agricultural and conservation. The land use changes that were noted since 1995-2012 include: encroachment on marginal lands for example the forest reserve and wetlands in Southern part of Mbale Municipality in Namatala and Maluku wards in Industrial division used for farming and settlement. Encroachment on farm land and on public open spaces for example Uhuru valley public open space in North central ward in Northern division and Maluku public open space in Industrial division. Increased commercial activities at the periphery of the Municipality in the three divisions. These land use patterns differ from Division to Division. In Industrial division there is mixed land use, an indication that land use patterns are influenced according to the type of activity in an area. In Wanale Division the area is largely residential despite the emergency of commercial and administrative activities in the area especially in Senior Quarters in Boma Ward. In Northern division land uses are mixed up where commercial activities have emerged in residential areas. The Central Business District has remained mainly for commercial activities with old Indian type of buildings dominating, though some current modern buildings are evident on roads like Naboa, and Republic Street. Generally in Mbale Municipality there is emergency of commercial institutions like hotels, schools, financial institution in residential areas, for example, in Maluku in Industrial Division, Namakwekwe in Northern Division, Senior Quarters in Wanale Division among others. Public open spaces, for example, Uhuru Valley in Northern Division and Maluku open ground in Industrial Division have been encroached upon for farming and settlement. Encroachment on

forest reserves and wetlands in areas like Namatala and Maluku in Industrial Division. Encroachment on river banks and flood plains, for example, Nashibiso Flood Plain in Maluku in Industrial Division and Nabuyonga River bank in Northern Division among others.

The causes of the changing urban land use patterns in Mbale Municipality are diverse ranging from political, physical, for example, relief, drainage and soil type. Socio-economic forces like increased demand for goods and services, population rise, land tenure systems have greatly influenced land use patterns in Mbale Municipality. Physical factors had more influence on land use before 1995 but currently (between 1995-2012) the socio-economic factors have more influence on land use patterns in Mbale Municipality. The effects of the changing urban land use patterns in Mbale Municipality are also diverse ranging from socio-economic and physical. For example, encroachment on forest reserves, wetlands and river banks resulting into floods for the case of Namatala area in Industrial Division especially when it rains heavily. Encroachment on marginal lands, farmland, public open spaces, construction in road reserves for the case of Mbale Bus Park and land use conflicts for the case of Mbale Golfers and NFA over Mbale Sports Club land in Wanale Division. Emergency of unplanned settlements referred to as slums/shanties, for example, Kiteso in Northern Division in Nkoma Ward, Shaba in Maluku in Industrial Division, Mooni and Busamaga in Wanale Division among other effects. It is a combination of the foregoing causes and effects which have greatly affected land use patterns in Mbale Municipality since 1995.

The extent to which the changing urban land use patterns in Mbale Municipality are related to the Mbale urban structure plans of 1954 and 1997 is quite significant and indeed this relationship is regressive as there is mixed up land use patterns in all the three divisions of Industrial, Northern, and Wanale, because developers are not following the Mbale urban structure plans. Zoning has been generally affected as land use is not as per the 1954 and 1997 Mbale urban structure plans.

5.2 Recommendations

Basing on the results of the study and conclusions, the following recommendations have been made.

Urban planners should clearly and keenly study the previous and current urban land use patterns in Mbale Municipality in all the three divisions of Industrial, Northern and Wanale so that they can effect proper planning, growth and expansion of the town. This can be done through proper allocation of land to only developers who can follow the structure plans put in place to guide urban land use.

The causes and effects of the changing urban land use patterns in Mbale Municipality need to be a pre-requisite of the stakeholders concerning Mbale Municipality, its land use patterns, growth and expansion. If these causes and effects are established, appropriate solutions to Mbale Municipality land use patterns can be established like proper land allocation, population control measures and provision of services, revision of land tenure systems among others.

Urban authorities in Mbale and other urban centers in Uganda should ensure that the urban structure plans are followed and laws should be made clear, to developers and any person obtaining the land or plot in the town to set up any activity.

The government through the Ministry of housing and urban planning, and other development partners should mobilize some resources to set up proper structures that are in line with structure plans put in place for proper growth of urban centers in Uganda Mbale inclusive.

The researcher further recommends that people owning plots in urban centres and cannot put up required standard structures in line with urban regulations, should be compensated to leave such plots for other developers and find other places outside the town. For the case of Mbale, this can help to avoid uncoordinated and unplanned activities that are coming up in the town hence distorting its proper growth.

The study revealed that people were not following structure plans in putting up buildings in the town. Therefore, the researcher recommends that a monitoring body be put in place in urban centres to ensure that physical planning and urban land use regulations are followed for sustainable development and to improve on the physical environment. However, this intervention

requires participation of both central and local government through NEMA because it is a National concern.

The study further revealed that there is laxity in implementing the urban land use policies by urban authorities. It is stipulated in Mbale Municipal Local Government Council three year development plan (2009/2010 to 2011/2012) that, inadequate enforcement and lack of public education has given developers opportunities to develop anywhere and in any way. And that modern buildings, containers and slums or shanties have been left to develop in their own way side by side as the Public Health Act of 1964 and Town and Country Planning Act are not being enforced. This is a clear testimony that land use guidelines are not followed due to lack of enforcement by urban authorities. Therefore, the researcher recommends that urban planners in Mbale and Uganda in general should come on board and devise means of enforcing and implementing land use policies/regulations in all urban centres of Uganda. This can be achieved by both central government and local urban authorities through Ministry of Housing and Urban Planning and Ministry of Local Government.

The above recommendation is in line with the article by Abou. K. in the New Vision of Wednesday 31st August 2011 on page 7. "Mayors and Technical staff of Municipalities have asked government to establish a land compensation fund to get rid of unplanned settlements from urban centres and find ways of boosting people's standard of living. People whose structures must be demolished to pave way for social infrastructure must be compensated and this requires a lot of money which is beyond the ability of urban councils".
Therefore, in reference to the above article, the researcher further recommends that land compensation fund be put in place at both local and National level. This will enable compensation of people in the Municipalities in Uganda particularly in Mbale whose structures are demolished and replaced especially as Mbale prepares for a city status.

In a related development, Moses. N. in the New Vision of Friday 9th September 2011 on page 9 disclosed that "low cost housing project was being funded by government in partnership with UN Habitat. A total of 250 people considered to be among the urban poor, living in slums will each acquire a permanent house upon the completion of the project in 2018". The researcher therefore, recommends that urban land development fund be put aside by the government to help to renovate and improve the decaying infrastructure in urban centres like maintenance and construction of new buildings, road widening and repair, maintaining sewerage system, proper garbage disposal, and provision of water among others.

5.3 Areas for further study

The researcher is of the view that similar studies be carried out on land use policy in Mbale municipality and in other Municipalities and cities of Uganda and major cities and towns of East Africa.

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APPEDIX (I) OBSERVATION SCHEDULE

The researcher observed the following aspects so as to get a clear picture on the land use changes and allocation in the municipality.

1. a) Nature of land in the area in relation to land use allocation (relief)

Steep slopes ☐
Gentle slopes ☐
Flatland or plain ☐
Low lying land/valley ☐

b) Soil Types

Clay ☐
Loam ☐
Sand ☐
Murram ☐

c) Drainage

Poorly drained areas (water logged) ☐
well drained areas ☐

2 a) New developments

New structures, for example, buildings ☐
New transport and communication lines, for example roads ☐

b) Quality of buildings

Permanent ☐
Semi-permanent ☐
Temporary ☐

3 a) Differences in Architecture and Urban Structures reflecting previous developments

Old Indian buildings ☐
Buildings constructed before 1995 ☐
Old style of construction of buildings ☐

b) Structural history of buildings

Old ☐
Recent ☐
Still under construction ☐

4 a) The effects of current developments on the environment in the area

Buildings constructed in wet lands ☐
Blocked drainage channels ☐
Garbage disposal places ☐
Flooded areas ☐

b) Surrounding physical features

Forests ☐
Swamps/wetlands ☐
Rivers/streams ☐
Springs ☐
Wells ☐

APPEDIX (II) QUESTIONNAIRES TO RESPONDENTS

Dear Respondent

I am a student of Kyambogo University pursuing a Master of Arts degree in Geography, carrying out research in Mbale Municipality on the topic, **Factors influencing the changing urban land use patterns in Mbale Municipality since 1995.** Therefore, any information given will be treated with extra care and confidentiality.

Section A: Personal Data

Code .....

Category of the respondent [Homesteads] [Commercials] [Industrialists]

Location

a) Physical location,

Relief [Steep slope] [Gently slopping] [Valley/low land] [Flat land/plain]

Soil type [Clay] [Loam] [Sand] [Marrum]

Drainage [Well drained area] [Poorly drained areas]

Structural history of the building [Recent] [Old] [Under construction]

Quality of building [Permanent] [Temporary] [Storey building] [Semi-Permanent]

Surrounding features [Forest] [Wetland] [River/stream]

b) Respondent's location

Division ..... Ward .....

Cell .....

Occupation .....

Level of Education | P.7 | S.4 | S.6 | Certificate | Diploma | Degree | Masters | P.H.D.

Sex | Female | Male

Age 18 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ 50 – 59 ☐ 60 – 69 ☐

70 – 79 ☐ 80 + ☐

Section B Demographics

This questionnaire has three parts for different categories of respondents which includes: homesteads, commercials and industrialists. This part is to be answered by homesteads only.

Part one Questionnaire to homesteads

1. How long have you stayed in this plot?

   .....

2. What was in this plot before you started staying here?

   .....

3. (a) How did you acquire this plot to build this house?

   .....

   (b) What are the effects of having residents/houses in this area?

   .....

4. Currently, what are you using this house for?

   .....

5. a) Was your house built according to plan? Yes/No

   b) What was the plan?

   .....

Part two Questionnaire to commercials (business community)

Dear Respondent

I am a student of Kyambogo University pursuing a Master of Arts degree in Geography, carrying out research in Mbale Municipality on the topic, **Factors influencing the changing urban land use patterns in Mbale Municipality since 1995.** Therefore, any information given will be treated with extra care and confidentiality.

Section A: Personal Data

Code .....

Category of the respondent ☐ Homestead ☐ Commercial ☐ Industrialist

Location

a) Physical location

Relief ☐ Steep slope ☐ Gently slopping ☐ Valley/low land ☐ Flat land/plain

Soil type ☐ Clay ☐ Loam ☐ Sand ☐ Marrum

Drainage ☐ Well drained areas ☐ Poorly drained areas

Structural history of the building ☐ Recent ☐ Old ☐ Under construction

Quality of building ☐ Permanent ☐ Temporary ☐ Storey building ☐ Semi-Permanent

Surrounding features ☐ Forest ☐ Wetland ☐ River/stream

b) Respondents' location

Division ..... Ward .....

Cell .....

Occupation .....

Level of Education ☐ P.7 ☐ S.4 ☐ S.6 ☐ Certificate ☐ Diploma ☐ Degree ☐ Masters ☐ P.H.D.

Sex ☐ Female ☐ Male

Age 18 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ 50 – 59 ☐ 60 – 69 ☐ 70 – 79 ☐ 80 + ☐

Section B Demographics

This questionnaire has three parts for different categories of respondents which includes: homesteads, commercials and industrialists. This part is to be answered by commercials (business community) only.

6. For how long have you operated this business?

.....

7. Previously, what was taking place in this area before you started operating your business?

.....

8. How did you access this area of operation?

.....

9. What are the effects of operating business in this area?.

.....

10. Do you have any intention to change your business?

.....

Part three Questionnaire to Industrialists

Dear Respondent

I am a student of Kyambogo University pursuing a Master of Arts degree in Geography, carrying out research in Mbale Municipality on the topic, **Factors influencing the changing urban land use patterns in Mbale Municipality since 1995.** Therefore, any information given will be treated with extra care and confidentiality.

Section A: Personal Data

Code .....

Category of the respondent Homestead Commercial Industrialist

Location

a) **Physical location**

Relief Steep slope Gently slopping Valley/low land Flat land/plain

Soil type Clay Loam Sand Marrum

Drainage Well drained areas Poorly drained areas

Structural history of the building Recent Old Under construction

Quality of building Permanent Temporary Storey building Semi-Permanent

Surrounding features Forest Wetland River/stream

b) Respondents' location

Division ..... Ward .....

Cell .....

Occupation .....

Level of Education P.7 S.4 S.6 Certificate Diploma Degree Masters P.H.D.

Sex Female Male

Age 18 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ 50 – 59 ☐ 60 – 69 ☐

70 – 79 ☐ 80 + ☐

Section B Demographics

This questionnaire has three parts for different categories of respondents which includes: homesteads, commercials and industrialists. This part is to be answered by Industrialists only.

11. When did you start operating this factory/industry?

    .....

12. What activity was on this land before you started operating this factory/industry?

    .....

    .....

13. How did you acquire this land to locate this industry/factory?

    .....

    .....

14. What prompted/made you to locate this industry/factory in this place?

    .....

15. What are the effects of having industries in this area?

    .....

KYAMBOGO UNIVERSITY

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KAMPALA

Date .....

.....
.....
.....

Dear Sir/Madam

RE: REQUEST FOR ASSISTANCE TO COLLECT DATA FOR RESEARCH

First and foremost, I would like to thank you for having sacrificed your time despite the busy schedule you might have to be with me today. I am a student of Kyambogo University carrying out a research in Mbale Municipality on the topic **"Factors influencing the changing urban land use patterns in Mbale Municipality since 1995"** therefore, you have been identified as a resourceful person to provide information regarding urban land use and land issues in Mbale Municipality.

Having realized your experience in Mbale Municipality as a resident, land owner, elder, stakeholder or policy maker, I would like to share with you the perceptions, concerns and suggestions regarding land use (activities) and land use planning in Mbale Municipality since 1995.

I would also like to inform you that the information collected from you will be treated with utmost confidentiality for purely academic purposes. I therefore, request you kindly to feel free to the discussions, and respond to the questionnaires provided by filling or ticking an appropriate answer as honestly as possible.

Thank you very much.

Yours faithfully,

Gesa Ali

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Department of Geography and Social Studies

10th May 2010

TO WHOM IT MAY CONCERN

GESA ALI

08/HD/88/MAG

This is to introduce to you the above-named student who is pursuing a Masters Degree course at Kyambogo University: He/she is a finalist.

He/she would like to be assisted in data collection to write his/her thesis.

Any assistance accorded to him/her will be highly appreciated.

for Nabbosa Milly (Ms.)
RESEARCH COORDINATOR