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ENVIRONMENTAL DEGRADATION IN UGANDA: THE CASE OF DEFORESTATION AND FORESTRY REHABILITATION STRATEGIES IN WAKISI SUB-COUNTY

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ENVIRONMENTAL DEGRADATION IN UGANDA: THE CASE OF DEFORESTATION AND FORESTRY REHABILITATION STRATEGIES IN WAKISI SUB-COUNTY

By

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DECLARATION

I, EDWARD K. MUPADA, hereby declare that the contents of this dissertation are a result of my own study and findings and to the best of my knowledge, they have never been presented for a degree in any other University.

EDWARD K. MUPADA Date: 31ST MARCH, 1993.

PROF. S.R. NKONOKI (SUPERVISOR) Date: 31ST MARCH, 1993

DEDICATION

To my mother, Joyce K. Nabeeta; my aunt, Manjeri Baluka and my brother Joel Z. Waako. Their contribution to my upbringing and my education is very much appreciated.

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By Edward K. Mupada

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ABSTRACT

This study is a systematic investigation into environmental degradation and forestry rehabilitation strategies in Wakisi sub-county, Mukono district, in Central Uganda. The study examines, analyses and characterizes the nature, extent, causes and impacts of deforestation and forestry rehabilitation strategies and the role of and involvement of women in natural resource use and conservation. The analysis involves socio-economic and political factors in understanding the factors that enhance deforestation and the nature of forestry conservation policies and strategies.

The environment of which forestry resources are part is seen in this study as the aggregate physical and biological factors and situations which influence the lives of human beings and all the social and cultural conditions which surround them. The human environment is therefore considered in this study to embody socio-economic, political and cultural factors. The physical and biological sets together with all the other components of the environment form the ecosystem of the nations production, exchange and consumption processes which impact upon factors such as deforestation.

Chapter two is an overview of Uganda's political economy and forestry resource management under British colonialism. British colonialism engendered the penetration of capitalism

into peasant communities in Wakisi sub-county. The result was the distortion of mechanisms that had been instituted by the peasant communities in the conservation of forestry resources. Rules to ensure social equity, stable livelihood and resource sustainability were dismantled with the penetration of colonialism especially with the spread of cash crop cultivation such as cotton by peasants. Colonial State policies were designed to meet the needs of the colonial economy. The colonial interests were geared toward exploitation of forestry resources rather than conservation. The colonial state policies were carried over into post-independence period which is discussed in Chapter three. The socio-economic and political chaos that ensued in Uganda after independence especially between 1966 and 1986, exacerbated deforestation trends.

Chapter four is the analysis of our research findings. The study shows that deforestation and forestry rehabilitation strategies in Wakisi sub-county have been impacted upon by demographic factors such as population pressure and migration; type and level of technology; and livestock production practices. Further, the production, distribution and consumption of forestry resources is largely determined by labour and social relations at the local and national levels. Unbalanced agrarian relations due to sharp socio-economic inequalities between the different categories of peasants, gender and capitalists have resulted into deforestation. In

the absence of proper Forest policies and structural transformation especially at the community level, peasant participation in forestry conservation will continue to be problematic. Even efforts by Donor Agencies for environmental-cum-forest resource conservation will continue to be based on technical solutions without much success in the provision of basic needs such as fuelwood, food and fodder to the majority of the peasants.

CHAPTER ONE

THEORETICAL FRAMEWORK OF THE STUDY

1.1 BACKGROUND TO THE PROBLEM

1.1.1 The trend of global deforestation

The term "deforestation" raises a number of fundamental theoretical issues. Deforestation has been defined as the permanent conversion of forest land to other uses including pasture, shifting cultivation, mechanized agriculture or infrastructure development (World Bank, 1991: 28; Kyle and Cunha, 1992: 7). Deforestation has also been seen in broad terms to refer to the removal of wood vegetation (Gore, Katerere, and Moyo, 1992: 42).

In this dissertation "deforestation" is defined as the continuous reduction in woody vegetation on farm land and in forest areas. Nowadays, the process of deforestation especially in the Third World Countries, Uganda included, is regarded as one of the greatest threats to millions of people in the World. Tropical forests are known to be responsible for providing food, fuelwood, shelter and fodder. In addition they are responsible for maintaining soil structure, nutrient composition, moisture retention levels, environmental balance and ozone layer stability, among many other uses.

Consequently, the main theme of most international literature of the last two decades on the inter-relations between human beings and their physical environment has been one of impending global ecological catastrophe (UNESCO, 1974; Eckholm, 1982; Timberlake, 1985; Conable, 1989; Harborth, 1991).

These researchers bring to our attention fundamental issues affecting our existence on planet Earth. A warming globe, threats to the earth's ozone layer, 'creeping' deserts which are diminishing agricultural lands, and soil degradation, among many others.

Global environmental trends threaten to alter the planet earth, as well as lives of many species including human species. Every year about 6 million hectares of productive dryland turns into worthless land. Further, an estimated total of 11 million hectares of forests are destroyed world wide every year (World Commission on Environment and Development, 1987). Most of such forest land is turned into fragile farmland. The resulting farmland is easily degraded by soil erosion and leaching of vital plant nutrients. The prevalence of such fragile farmlands, has precipitated serious environmental degradation.

1.1.2 Deforestation in Africa

On the African continent the process of environmental degradation has grown very acute over the last two decades (1970s and 1980s). Millions of people have suffered the consequences of such widespread environmental degradation. For example, the great drought of the early 1970s struck the Sahelian and Sudano - Ethiopian regions. Between 100,000 and 250,000 people died (Ghai, 1991:5). About 3.5 million head of cattle (25 percent of the total) died in the Sahel in the 1972 - 1973 period (Granger, 1990 and Ghai, 1991:5). Within the period of 1983-1985, the drought spread over thirty countries in Western, Eastern and Southern Africa. A vast population of about 30 million people had been adversely affected by the drought at the end of the 1983 -1985 period (Ghai, 1991:5).

The occurrence of droughts and consequent threat to the survival of human kind can not be wholly ascribed to physical deforestation trends and has been discussed in subsequent Chapters in this study. Nonetheless, deforestation in Africa causes great concern. Africa's 700 million or so hectares of forests in the 1980s were being cleared at the rate of 3.8 million hectares (0.6 percent) each year (Hammond, 1990:292). Deforestation outstripped the rate of new tree planting by 29 to 1 (World Bank, 1989). In this way, more than 63 percent of Africa's rangelands has been lost (McNamara, 1990). The World Bank estimated that eighty to ninety percent of

Africa's rangelands and 80 percent of cropped land in the dryland areas may be affected by soil degradation (World Bank, 1989). In a nutshell, in Africa, the problem is the dwindling of the major energy resource in the form of fuelwood on one hand, and the negative impacts of run-away deforestation on the other hand (Nkonoki, 1991:36). And this is aggravated by failure to develop alternative sources of fuel for the majority population. There are alot of propositions as to the causes of deforestation in Third World Countries and these will be discussed in detail in the section on theoretical issues.

In East Africa, depletion of woodlands is on the increase. Within the period 1981-1985, Tanzania was experiencing an annual deforestation rate of 1.3 percent from its estimated forest area of 420,000 square kilometers (World Bank, 1991:268). In Tanzania, woodlands and forests are essentially restricted to the West and East of the country. These woodlands and forest resources are under pressure and an estimated annual deforestation rate of 10,000 hectares per year raises alot of concern (Millington and Townsend, 1989:139). In contrast, within the period of 1981 - 1985, Kenya experienced a deforestation rate of 0.39 percent of its 24,000 square kilometers of forest area (World Bank, 1991:268).

Generally, in East Africa women and sometimes also young girls, are known to be walking long distances year after year in search of and ferrying fuelwood or wood for other uses; thus spending a lot of time and muscle energy on that activity than on productive activities. An average family (of five) spends 200 to 300 'man-days' on searching for wood, cutting and ferrying firewood annually (Nkonoki; 1991:36).

1.1.3 Deforestation trends in Uganda

In 1900, Uganda had an area of 30901 square kilometers of forest and moist thicket with a real forest cover of 12.7 percent. By 1958 the area of forest and moist thicket had been reduced to 11176 square kilomtres with a real forest cover of only 4.6 percent (Langdale and Brown, 1960).

The total area of the Forest Estate, under the Forest Department, on June 30 1971 was 161,311 hectares; of which 831,921 hectares were classed as productive forest and 781,390 hectares were classed as protective forest (Uganda, Forest Department, 1971). Deforestation in Uganda became a distinct problem especially from the early 1970s. Over a ten year period, the Forest estate was diminishing at a rate of about 20 percent every year (Hamilton, 1987:18).

The decade of 1970s in Uganda witnessed a rapid breakdown of the socio-economic and political structures. The harsh economic and political conditions pushed people

from towns to the country side. Labourers in collapsing factories sought relief in the surrounding countryside to grow food drops. People shifted from the growing of cash crops like cotton to the growing of food crops like bananas. Around Wakisi the area where people used to grow plenty of bananas became forest areas. This led to Massive clearance of Forest Reserves.

Over the decade of the 1980s, deforestation was at a rate of 0.8 percent for open forest (public lands) and 1.3 percent for closed forest (forest reserves). Deforestation out-stripped the rate of new planting by 25 to 1 (Hammond, 1990:292). The annual fuelwood consumption figures rose to 14,280,200 m^3. Fuelwood is used mainly in the subsistence sector for cooking, crop processing, brick-making etc. (Uganda, Forest Department Report, 1980 - 83).

Currently in Uganda, a high proportion of the country's natural forests have been cleared for agriculture, timber, fuelwood, charcoal and building poles, among many other uses. The most rampant activity which caused deforestation over the period 1970 to 1987 was "illegal agricultural encroachment" on central government forest reserves for the purposes of securing agricultural land especially in the districts of Mukono (Mabira forest); Mbale (Mt. Elgon forest); Kiboga; Kabale; Mpigi; Bushenyi; and Mbarara. However, deforestation on public lands is also taking place at an alarming rate.

Unfortunately, accurate data on the Ugandan deforestation trend on public land is very scanty. By and large, there has been a reduction in the forest cover from 12 percent of total land area at the beginning of this century to less than 3 percent today (Baranga, D. In Suliman, M. (ed), 1991:107).

In Wakisi sub-county deforestation was most vivid in Mabira forest Reserve. A big part of Mabira lies within Wakisi sub-county. Generally by 1965 forests covered about 80 percent of the total area of Wakisi sub-county (see Map 3).

By 1978, two thousand peasant farmers were settled in North East Mabira in Wakisi sub-county, Mukono district. The number of encroachers in Mabira had increased to over 350 families by 1986 (Uganda, Forest Department Report, 1990). Over a ten year period, Mabira Forest Reserve (29693 Ha) was reduced by a figure of 33 percent (98900 Ha). Similar trends have occurred on public lands which have resulted in the present forest cover of the about 5 percent of the total area of Wakisi sub-county (see Map 4).

1.2 Statement of the Problem

Arising from the preceding background, the emerging problem in Wakisi sub-county is the dwindling forest resources such as fuelwood, building poles and fodder. Deforestation in Wakisi sub-county is an element of environmental degradation. The major problem of this study

was therefore to carry out a systematic investigation into environmental degradation with particular reference to the nature, extent, causes and impacts of deforestation and **to assess forest rehabilitation strategies in Wakisi sub-county.**

1.3 OBJECTIVES

1.3.1 General Objective

The main objective of this study is to examine, analyse and characterise the nature, extent, causes and impacts of environmental degradation in Wakisi sub-county, Mukono district in central Uganda, with specific reference to deforestation and Forestry rehabilitation strategies; including the role and involvement of women in natural resource use and conservation.

1.3.2 Specific Objectives

This study has got the following five as its specific objectives:

1. To identify and attempt to explain the causes of deforestation in the sub-county under study.

2. To study current forest management policies, strategies and practices and evaluate the adequacy and efficiency of such system or otherwise for sustainable forest resources in Wakisi sub-county.

3. To study the traditional current roles of Women and their involvement in environmental-cum-national resource management including resource conservation with particular focus on forest resources.

4. To investigate the role of foreign aid/technical assistance in strengthening local forestry management capability.

5. On the basis of the findings to recommend policy measures which might improve and protect the environment in the area of study.

1.4 HYPOTHESES

1. Deforestation in Wakisi sub-county is partly due to activities such as logging for timber, charcoaling and felling of trees for other uses especially for firewood; population increase; type and level of technology.

2. In the formulation of policies and strategies to address the deforestation problem in Uganda in general ,and in Wakisi sub-county in particular, there is no integrated approach concerning issues and/or factors such as culture, gender, agriculture and livestock production practices, income levels, ownership rights, etc.

3. The multiplicity of policies, bye-laws and strategies pursued so far in tackling the deforestation problem have not involved fully the local communities in Wakisi sub-county who are the beneficiaries and should be active participants in such efforts.

4. Forestry programmes and government policies which are geared to forest conservation in Uganda have not been able to address adequately the role of gender issues implicit and explicit in the production, distribution and consumption of forest resources.

5. Women were intricably involved in resource management in "traditional" society but currently they are more and more getting marginalized with regard to ownership of natural resources, the current tempo of human rights and women liberty notwithstanding.

6. Successful utilization of foreign aid/technical assistance in tackling deforestation problem is conditional on the local institutional capacity building, including development of technical capability; and integration of forest management practices into the whole national socio-economic development framework.

1.5 SOCIAL SIGNIFICANCE OF THE STUDY

This study is of great significance at theoretical and practical levels. At the theoretical level, the study will contribute to the on-going debate on the environment including aspects such as technology, culture, gender, politics and the environment at local and national levels in Uganda. At the policy level, the study gives some specific data and experiences of environmental management policy, and practice thus extending our understanding of the problem of deforestation in Wakisi sub-county which in turn will contribute to informed policy and strategy formulation with regard to forest conservation in general and forest management in particular. Thus, the study contributes knowledge which will be an input in the national planning of environmental programmes related to forestry in so far as the study provides to existing data base some new insights and information regarding the problem of deforestation and provide options for addressing the problem.

1.6 LITERATURE REVIEW/THEORETICAL ISSUES

1.6.1 The Concept of Sustainable Environment and Sustainable Development

The term "environment" has been defined variously and at different theoretical conceptions. It is important to get a good grasp of the meaning of environment and consequently the scope of its theoretical implications. When considering an issue like deforestation the concept of environment and the

way it is defined will both influence other issues like the causes of deforestation and the solution to the problems of deforestation.

There has been a tendency to view the environment in physical, ecological and technical terms. Consequently, the human environment has been defined as the biosphere which is part of the planet in which life exists and of which it forms a part (Dasman, 1968:9). Thus, the environment is seen as consisting of the earth which is made up of the atmosphere, the oceans, the upper surfaces of the land areas of the continents and islands. And the fresh waters that inhabit this area.

In this study, the environment is "the aggregate physical and biological factors and situations which influence man's life and all the social and cultural conditions which surround him" (UNESCO, 1974:129). The human environment encompasses economic, political, social and cultural factors. When put together with the physical and biological sets, these factors form the ecosystem of the nations production, exchange and consumption processes. Evidently our definition of the environment goes beyond biological and/or physical artefacts.

Definitions based on biological or physical artefacts seek solutions to environmental problems such as

deforestation, in technical terms only. The main shortcoming of technical solutions to environmental problems is their lack of integration of environmental issues into the whole national development fabric. Uganda has been characterised by the marginalization of environmental issues at theoretical level in national development plans (Uganda, NEAP, 1992). The integration of environment and development policies is the best path to sustainable development (Fadaka, 1991:30).

When we speak of "sustainable development" we mean a development appropriate to the needs of today's generation without jeopardizing future generations' chances of satisfying their own needs and choosing their life style. The demand implicit in this definition is that development be made "sustainable" applies to all countries and all people. The aim therefore is to achieve at least a minimum standard valid for all (Hauff, 1978:15 in Harboth, 1991:19).

Consequently, Chandler has argued, development policies can no longer solely be applied to the Third World but have to be applied to the whole world. A case in point is the loss of tropical forests which will have implications for all countries. For example, all material resources for manufacture of pharmaceuticals were discovered in nature, including Curane, Quinine and Reserpine (Chandler, 1991:18). The relationship between the rich and poor has encouraged waste on the part of developed states. These states obtain

cheap forest resources in abundance from developing countries (Kibola, 1981). This situation has tended to ensure a systematic exploitation of resources from the developing countries. Such exploitation has brought a devastating effect on the environment resulting into environmental degradation. Further, deforestation undermines development by destroying watersheds, reducing fuel and material availability, destroying species and affecting global climate. In Uganda deforestation has affected development by degrading rural farmland, eroding people's incomes and time spent in, especially, the collection of fuelwood (Chaudhry, 1984:89-95).

The solution to deforestation and environmental degradation in general lies in addressing the real causes of deforestation and partly to understanding the socio-economic and political factors that affect forest conservation. The next section in this chapter examines this issue.

1.6.2 Conflicting Views on Environmental Degradation

The problem of environmental degradation has often been conceived of in technical terms. Consequently, environmental degradation is defined as loss of soil, deforestation, extinction of Wildlife and plant species, overstocking, inappropriate farming practices, overpopulation, spread of deserts, pollution of waterways, sedimentation of dams and irrigation schemes (Dasman, 1969; Baranga, D. 1991).

However in the case of Uganda deforestation has been greatly effected by the socio-economic and political systems of both the colonial period and post-independence (Hamilton, 1987). These socio-economic and political factors are not in anyway unique to Uganda but cut across the board in the vast majority of sub-saharan African countries and are the fundamental basis for problems sometimes culminating in terrible crisis like the Sahel famine (Kibola, 1981:4; Ghai; 1991:6).

By and large, even the Neo-Malthusian theory which holds that rapid rate of population growth has forced reduction in the size of farm holdings, led to misuse of land, depleted the supplies of fuelwood and increased the cost of food can hardly explain the deforestation trends in Uganda in general (Lockwood, 1991:12). The Neo-Malthusian approach which puts most emphasis on population growth ignores historical experience and abstracts from variations in social structures and in demographic patterns (Williams, 1990:19). In the case of the former district of East Mengo, in central Uganda, where Wakisi sub-county is situated, there was an influx of migrant workers especially in 1960s and early 1970s due to the presence of tea estates and sugar-cane plantations. Therefore the increase in the local population was not simply due to new births (Langlands, 1974:33; Kiwanuka, 1991:25-32).

Nevertheless, our argument should not be taken to mean a downplay of the role of demographic factors in deforestation trends in Uganda. In this context, we totally disagree with the Cornucopian view which holds that there is no environmental, population or resource crisis (Tyler and Miller, 1988:18). In the case of Uganda there is overwhelming evidence that many parts like Wakisi sub-county are experiencing a fuelwood crisis with no immediate solutions in sight leading to poor health and misery (Chaudhry, 1984:93).

The depletion of forest resources is now a common phenomenon in the Third World and rural women suffer in collecting firewood from long distances yet the number of trees planted to meet the need is abysmally low (Anand and Agarwal, 1983). Thus, apart from socio-economic and political factors, it is important to understand the gender division of labour in order to come to a full grasp and informed appreciation of the problem of deforestation in Uganda.

Understanding the "gender" division in this context does not only show difference between men and women as distinct categories, but also it sets other categories such as relations between landlords and tenants, elderly and young people, senior and junior wives, residents and migrants, as well as divisions between people in different marital positions, differences within sex groups as well as between

them are equally significant. It is within this context that we now review the next section.

1.6.3 The Exploitation of Forest Resources: Population pressure, Technology, Labour and Changing Social Relations

Conceptualizing environment in a multi-disciplinary approach makes it possible to isolate and at the same time integrate issues which are gender sensitive. It also makes it possible to locate the role of women and men in dealing with the production, distribution and consumption of forest resources.

Organizational efforts and structural changes tend to place women in a secondary position. If activities are planned, they tend to cater to women's domestic roles and rarely to their "economic" potential (Hahn, 1982). This seems to have maintained the state of inequities for women's legal ownership of land and products of land and land-related resources such as trees.

Few governments or donor agencies have endorsed alternatives for women's direct access and legal ownership and productive use of land and this is one of the major problems in Uganda (Maitum, 1985:157). In addition to the denial of women access to or ownership of basic factors of production, women have inadequate access to information and

skills. Male extension workers, it is believed, do not as a matter of custom, directly approach another man's wife. Where women do not have equal access to land, labour, credit and information, they are consequently unable to produce more either for their families or the nation (Keller, 1985). In Uganda the main issue regarding women's rights and access to the products of their labour in this case forest resources involves dealing with legal rights (Maitum, 1985:157).

In considering women's legal rights/status and related statutory changes, one must also deal with cultural and attitudinal barriers. There are cultural stereotypes and long established opinions covering the role and place of women in their duties and responsibilities in society in general and in the family in particular. For example, there are often than not social differences between men and women on the perception and need for fuelwood and/or charcoal. If it is men who make decisions about starting village projects, they might, callously, rate women's labour low and may therefore decide against a village woodlot to which they (men) would have to contribute labour (Skutch, 1983). These gender issues operate within a wide context of environmental degradation.

Environmental degradation is said to have become so serious in the Third World, Uganda included, that these countries are said to have over-drawn their environmental

accounts. In the case of Uganda the rate of annual deforestation has been estimated at 1.3 per cent compared to 0.6 per cent for the whole of Africa and yet the average annual reforestation is only 2,000 Ha against the 355,000 Ha annual average reforestation rate for Africa in general (Hammond, 1990:292).The Unfolding result is no doubt the growing trend towards subsequent environmental bankruptcy. Uncontrolled deforestation is a symptom of a society's inability to get to grips on other fundamental development problems. These problems include agricultural stagnation, grossly unequal land tenure, rising unemployment, rapid population growth, and the incapacity to regulate private enterprise in the context of protecting the public interest (Eckholm, 1982:161; Mamdani, 1990:459).

The rural peasant exists on a day-to-day, hand-to-mouth basis. On the other hand, most government and political leaders, agents and managers of big finance capital "eat" (or siphon) whatever little is generated or "earned" by the work of women and men in the working/labouring classes (Banugire, 1991:95).

The problems of environmental degradation have been exacerbated by the break down of indigenous local political institutions. Indigenous local institutions which traditionally performed the co-ordinating and regulating functions in environmental resource use in pre-colonial

Uganda were superseded by supralocal socio-political institutions (Mung'ong'o, 1990; Mamdani, 1992:20-21). In pre-colonial Uganda especially in Wakisi sub-county, the local people had developed environmental conservation measures which included bush- and fallow cultivation.

The penetration of commodity relations and new, alien, privately owned technology into peasant agriculture radically overturned the original environmental balance. This was exacerbated by the state's expansion of social and economic infrastructure (Cliffe and Moorsom, 1979:46). It is within the context of this argument that we discuss the next section.

1.6.4 The State and Administration of Forest Conservation Programmes

At the centre of all the problems of environmental degradation, and deforestation in particular, is the role of government policies in forest conservation. In the context of Uganda's history, the effects of forestry policies on deforestation and their practice has been dealt with in detail in Chapter two. Suffice to mention here that the colonial state concentrated on exploitation of forestry resources and did little to encourage community participation in the management of forestry resources (Hamilton, 1987). The economy was geared toward production of agricultural raw materials for British industry (Mamdani, 1987). At the time

of independence and even through the period 1960-1970, the World Bank was not interested in funding forestry projects because of their "low economic potential" (Mamdani, 1987).

In Uganda, the legacy of promoting agricultural production without prudently incorporating the conservation of forestry resources has haunted the post colonial state. The policy of "double food production" of the Amin era gave people the green light to enter and actually live in forest reserves where they cleared forests for agricultural production. Such activity resulted in other subsidiary activities such as charcoaling and timber trade (Hedberg, 1991: 95). The pressure on Uganda forest reserves and savanna woodlands, intensified over these years especially from the early 1970s to the end of Amin's regime in 1979 (Chaudhry, 1984).

Elsewhere in East Africa, the drive to boost agricultural production dominated Tanzania's politics in the 1970s. The problem of woodland depletion, especially the Miombo woodlands, was enhanced by the villagization programme of 1973/74 (Misana, 1988:7). The villagization programme involved the establishment of concentrated or nucleated villages, apparently on the rationale that government would then easily provide services such as agro-inputs, water, schools, dispensaries, etc. The concentration of rural populations in the villages put so much pressure on the

surrounding vegetation, especially forest resources because of livestock grazing and led to the depletion of pasture and forest resources; thus resulting in serious environmental degradation in a substantial number of such so called planned villages.

By and large, even where environmental programmes have been carried out, the socio-economic and political issues have not been addressed properly. The government may see little economic motive in investing in the rural hinterland. As government policies degrade the rural resource base degraded farmland produces little of economic value (Banugire, 1989; Ghai, 1991; Green, 1991; Kyle and Cunha, 1992). This is aggravated by political instability, corruption, illegal forest activities by government officials and illegal agricultural encroachment (Hamilton, 1987:71).

In order to solve the problem of environmental degradation and economic crisis, Third World Countries, Uganda included, resort to foreign aid and the help of Non-governmental organisations.

1.6.5 **Foreign Aid, NGOs and Forest Conservation Programmes**

Sub-Saharan African governments are beset by low commodity prices, by high oil prices and by high interest rates. These are aggravated by a high value dollar and debts

which are huge in proportion to foreign exchange earnings (Onimode, 1990; Mamdani, 1990, Banugire, 1991).

To solve her economic problems, Uganda like many other Third World Countries, has sought foreign aid especially from the World Bank and IMF. However, in the economic recovery programmes environment can be viewed as a separate late add-on to the main goals of national Structural Adjustment programmes. Environment programmes are likely to be under-funded and not integrated into main issues of action plans.

In the abstract, Structural Adjustment Programmes are based mainly on macro-economic, that is resource allocation level, and are highly generalized at the micro-economic level of detailed analysis. As such it is difficult to deduce ecological development strategy from either macro-economic or micro-economic analysis (Green, 1991:38).

On the other hand, it appears that technical solutions such as re-afforestation, changes in human settlement patterns, application of sprinkler irrigation, etcetera, have to be coupled with institutional solutions such as appropriate and consistent suitable property rights and an understanding of gender relations if problems of environmental degradation and management have to be adequately addressed (Chandler, 1990:25). Unfortunately, Non-Governmental Organisations involved in forest

conservation programmes in Uganda are pinning their strategies almost exclusively on technical solutions. These NGO supported environmental conservation programmes lack meaningful democratic participation by the local people; neglect livelihood issues; rely heavily on external human and material inputs; and they employ short-term time frames which do not encourage in-depth multi-disciplinary research before project initiation (Cruz, 1991).

1.7 RESEARCH METHODOLOGY

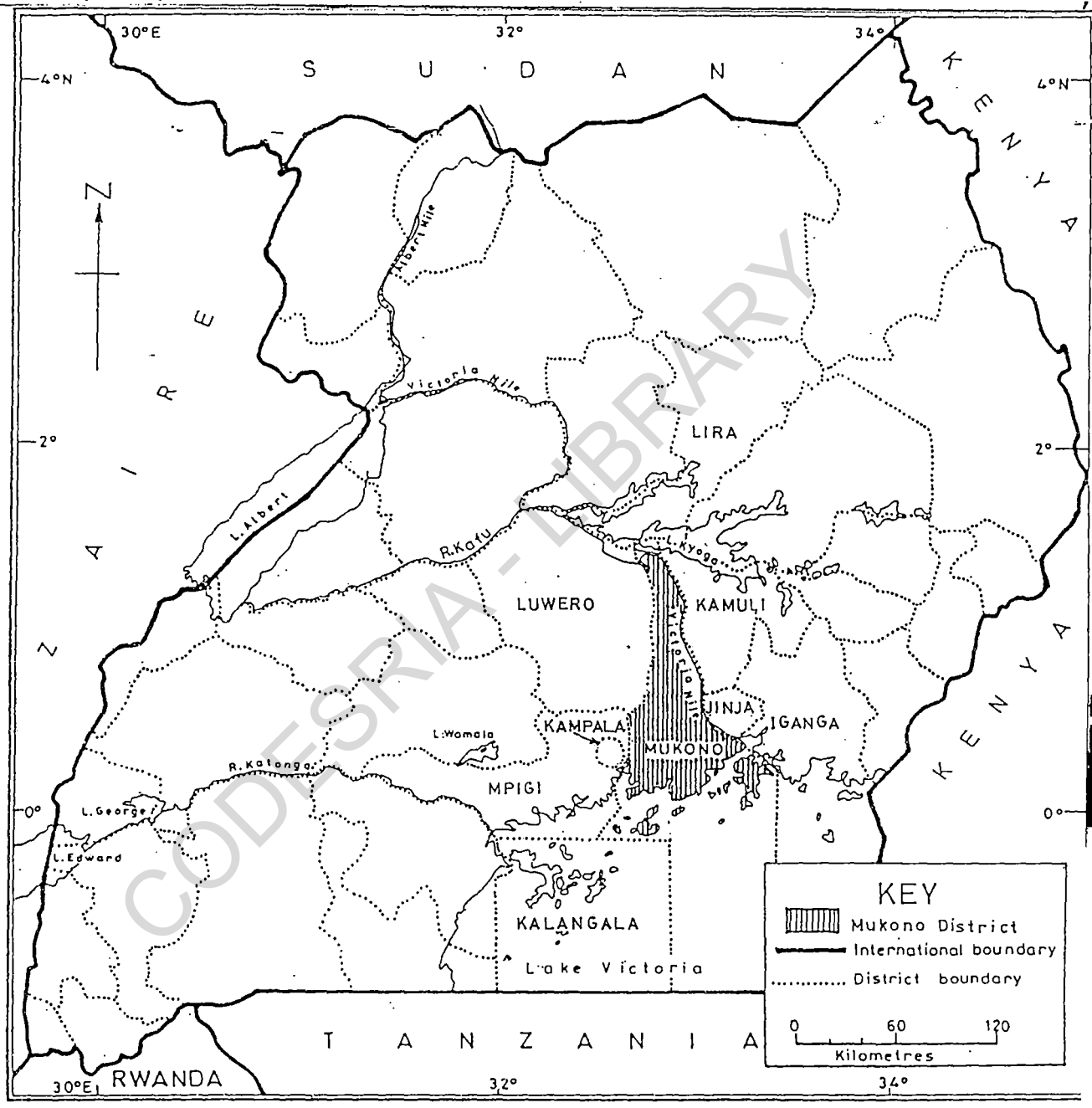
1.7.1 Location of Study Area

This research was conducted in Wakisi sub-county.

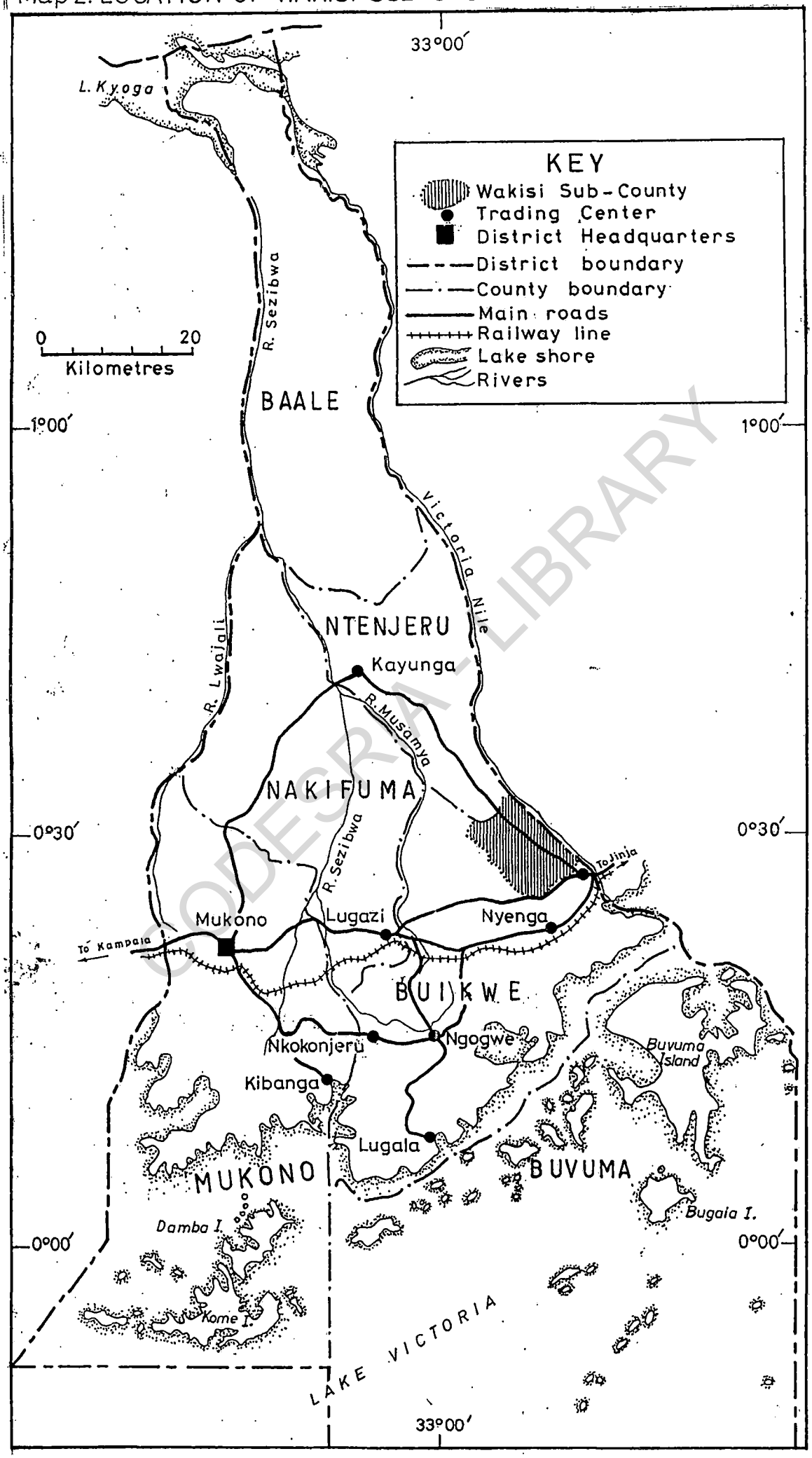
Wakisi sub-county is situated in Mukono district in Central Uganda (see Map 1). It is situated on the extreme eastern side of Mukono district, next to the River Nile (see Map 2). It lies between 33° - 05′ - 33° 10′ E and 0° 35′ - 0° 25′ S.

Wakisi sub-county has an area of 103.75sq. km. Of the total area of the sub-county, 68 percent are Government Forest Reserves, 10 percent are tea estates and sugar-cane plantations, 2 percent are diary farms and 20 percent is covered by crop farm land (see Map 3). It is composed of the following Resistance Council II villages: Kalagala, Konko, Malindi, Nakalanga, Naminya and Wakisi.

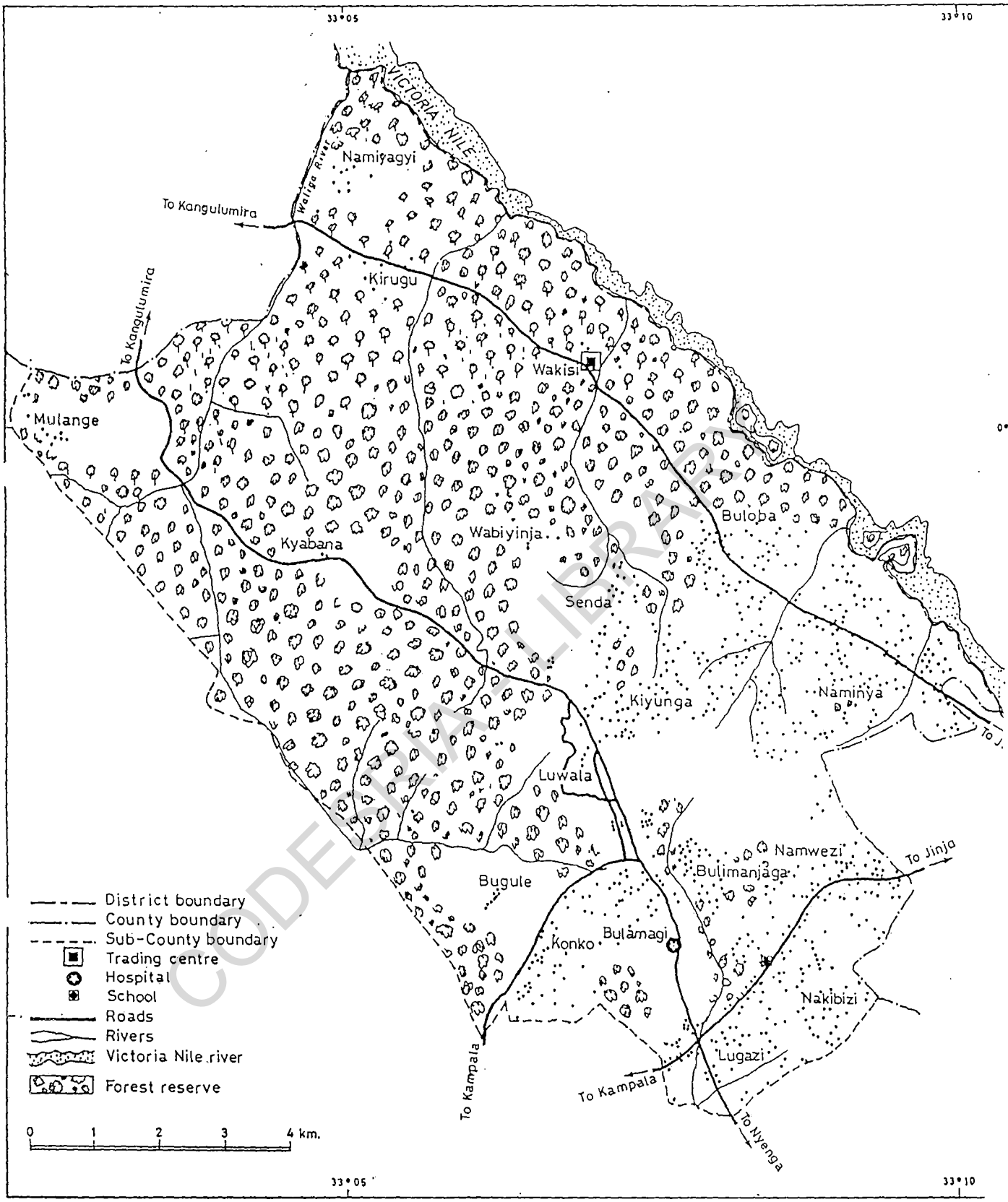
Map 1: LOCATION OF MUKONO DISTRICT IN UGANDA



Map 2: LOCATION OF WAKISI SUB-COUNTY IN MUKONO DISTRICT, 1992



Map 3: LOCATION OF WAKISI SUB-COUNTY., 1965



The main economic activities are subsistence agriculture, livestock keeping, forestry exploitation (maily for firewood, and commercial purposes), and casual labour. The main crops are: maize, beans, cassava, sweet potatoes, bananas, soy-beans, and coffee. The main livestock are catlle (1400), goats (3900), sheep (560) and pigs (4000).

The area is intensively cultivated and with the exception of Government Forest Reserves, the few trees available are spotted on farm land. The major tree species include;

Markhamia platycalyx, Mangifera indica, Albizzia spp., Ficus natalensis, and Heterophyllus cartocarpus (see Appendix XI).

The area is characterised by flat topped hills which are heavily cultivated and rising to an average height of 1400 metres above sea-level.

The principal rock types are granite gneisses and granites with an overlying series of metasediments which includes schists, phyllites, quartzites and amphibolites. The shore-line along R. Nile is rocky and steep. Wakisi sub-county receives an average rainfall of 1000mm per year with two peak seasons in April-May and September. The area normally receives two rain seasons in the year. The first rains begin in March upto end of May. They are followed by

a shoot dry spell in June, and July. The second rains normally begin in August to the end of November. They are followed by a longer dry spell from December to the end of February. However, the rain seasons have become quite erratic.

In 1980, the population of Wakisi sub-county stood at 23,139 (Uganda Population Census, 1980). By 1990 the population had risen to 28,133 (Uganda Population Census, 1990). This represents an increase of 22 percent. The average family size is seven persons.

In the face of a rapidly growing population in Wakisi sub-county and dwindling forest resources, there is a looming problem of deforestation and subsequent soil erosion, scarce and erratic rains and critical shortage of fuelwood which form the major energy source for the majority of the population in the area.

Forest resources play an important role in the socio-economic and political lives of the Wakisi people. In Wakisi despite the importance of forest resources as sources of fuelwood, timber, building poles, food and fodder, deforestation has nowadays emerged as one of the major problems.

Thus, Wakisi sub-county in Mukono district was purposely chosen as the area of study. In choosing Wakisi sub-county we concurred with Kidder (1981) who argued that the basic assumption behind purposive sampling is that with good judgement and an appropriate strategy one can handpick the cases to be included in the sample. A common strategy of purposive sampling is to pick cases that are judged to be typical of the population in which one is interested, assuming that errors of judgement in the selection will tend to counter balance each other.

Wakisi sub-county was chosen for this study especially because of her special profile or characteristics which include:

1. One of the areas in Uganda where deforestation is taking place at an alarming pace.

2. It is an area where a number of women groups and non-governmental organisations have been carrying out forest conservation programmes.

3. It is an area where no in-depth socio-economic study has been done on environment and deforestation particularly in the recent past (five years).

1.7.2 Data Collection Techniques

(a) **Main Approaches**

i) Documentary Research especially with regard to legislation.

ii) Open ended interviews with elders and community leaders in Wakisi sub-county.

iii) A questionnaire was administered to a sample of population in the study Area.

iv) Interviews with the extension personnel of the following Central Government Departments: Forestry, Agriculture, Veterinary, Health, Community Development, Education, Administration, and Lands.

v) Observation especially identifying aspects of environmental degradation.

(b) **Data Collection**

i) Documentary data was gathered from the Central Government Departments of Forestry, Veterinary, Agriculture, Lands, Community Development, Youth, Women in Development, Education, Administration and Health. More secondary data was gathered from the National Archives, Makerere University Library, Makerere Institute of social Research and News Papers. The sources included departmental records and correspondence.

The data gathered from the above sources focused on how extension services in the Forest

Department and other departments have affected deforestation trends and forest exploitation and conservation in Uganda and Wakisi sub-county in particular from colonial times to the present time. We also sought to establish from a historical perspective how agricultural practices, livestock Production Practices, Demographic Changes and Forest Management practices have enhanced deforestation. From the departmental records we also investigated how social issues and infrastructure like roads have influenced deforestation trends.

Further how changes in the economic activities and type of technology used in Uganda and Wakisi sub-county in particular have been a factor contributing to deforestation trends. The activities of NGOs, IMF and World Bank were also investigated and/or deduced from the departmental records. The aim was to establish their effect in forestry conservation and thus deforestation.

ii) A household is defined as comprising a person or group of persons sharing a common source of food.

The household questionnaire used aimed at gathering social, gender, demographic and economic

factors. The aim was to investigate how each of the above factors is related to forestry exploitation, conservation and deforestation in Wakisi sub-county.

We investigated how household size and composition relate to deforestation. Further, we sought to establish how household economic activities like subsistence agriculture, livestock keeping, forestry exploitation and casual labour influence deforestation in Wakisi sub-county. Forest practices and use of forest products such as in domestic cooking were investigated to establish how they affect forestry conservation and exploitation and hence deforestation.

Land ownership and cropping patterns were examined to find out the relationship between land ownership rights, security of land and tree tenure and cropping patterns on forestry conservation and how they enhance deforestation.

Information about heads of households which included age, sex, education and marital status was sought to get the cumulative total of the bio-data and analyse how it has influenced deforestation.

Participation in group or community programmes by the peasant cultivators was necessary to investigate community

involvement. Also included was to examine the role of NGOs and Aid organisations in enhancing local participation in forestry conservation and the effect of their policies on deforestation. Historical changes in socio-economic and political aspects in the households and villages were investigated and analysed to find out their effect on deforestation trends.

Informal group interviews using the same questionnaire were conducted to supplement and double check on the reliability of the information gathered at the household level. The groups were mostly of women from the households interviewed and the members of the tree planting projects. We further enhanced reliability of information by interviewing the female and male members of the households separately as much as possible. Most of the women were difficult to interview because of their busy schedule, consequently, on a number of occasions women were interviewed while they were doing their domestic work.

Additional primary data was collected through semi-structured interviews from the Resistance Committee members and local chiefs, and elderly people in the villages. Information gathered here was similar to that of the household level but we sought to understand changes in socio-economic, and policy activities at the community level.

Aspects covered in the enquiry at the community level included village size and composition, community activities, land ownership, cropping patterns, forestry conservation programmes, types of NGOs and Aid organisations involved in forestry conservation programmes.

Community size and composition were examined to find out the impact of deforestation on the different categories in the population such as the young, the elderly, the women and men, the poor and rich. Also how each category of the population enhances or checks on deforestation trends. Further, community activities like cropping patterns and economic activities were investigated to establish how they affect Forestry Management. How the growing of crops such as maize, beans and cassava has contributed to deforestation was covered under cropping patterns. Also included under cropping patterns was the movement of peasant cultivators into marginal lands and how that phenomenon has enhanced deforestation.

An enquiry was made into customs, rituals and other traditional codified knowledge as far as forestry resource conservation is concerned and investigated how they affect forestry conservation and hence deforestation. We examined the Government Forestry Conservation policy interventions and their effect over time to establish the historical development of deforestation in Wakisi sub-county.

Unstructured sampling was used in the selection of respondents at household level. Twenty five (25) households were randomly picked from each of the Six Resistance Council II villages namely; Kalagala, Konko, Malindi, Nakalanga, Naminya and Wakisi. This formed a basic sample of 150 households. To enhance the validity of our research findings, we interviewed several other people who are not part of our basic sample.

In households with more than one member, at least two members were interviewed. This was preferably wife or wives and husband. In the case of polygamous homes the husband and all his wives were interviewed. It was important to interview both men and women to address especially differences in perception of the problem under study.

The other respondents, who were purposely chosen due to their small number, included Resistance Council (RC) officials, and chiefs at village and sub-county levels. Also elders in the village, who were identified as resourceful persons were interviewed. These included both men and women.

Department officers working on extension services included those of forestry, agriculture, lands, community development, Youth and Culture, women in development, education, administration and health. And some of the

officers in Non-governmental organisations operating in Wakisi sub-county were interviewed.

1.8 Limitations of the study

It should be recognized that this research is based on a case study and therefore its results may not be easily generalized for other areas in Uganda although the underlying theoretical principles are generally applicable. To get a comprehensive socio-economic and political analysis of deforestation in Uganda it is necessary to carry out similar studies in other parts of the country. Nevertheless, the study forms a fundamental theoretical and policy starting point for further research and policy implementation.

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CHAPTER TWO

AN OVERVIEW OF UGANDA'S POLITICAL ECONOMY AND FOREST RESOURCE MANAGEMENT UNDER BRITISH COLONIALISM

2.1 Colonial Economy in Uganda: Penetration of Capitalism and Environmental Degradation

The history of human beings is a product of their labour, which is in turn the medium of interaction between them and their environment. People appropriate and change nature through labour, and in the process of transforming themselves, they in turn transform their own nature. Hence, their development begins with their appropriation of nature and with the social relations they forge in the process of sustaining and reproducing themselves (Mamdani, 1979:18).

In Uganda, even before the advent of colonialism, the process of transforming nature was taking place. In Kyaggwe county where Wakisi sub-county is situated in the former kingdom of Buganda, the dominant mode of economic activities was agriculture; however, hunting, gathering fruits and livestock keeping also took place on a limited scale (Kiwanuka, 1971). Nevertheless, the agricultural mode of production was by no means limited to Buganda only.

> "Whatever the differences in their level of social development, the colonized people had mainly an agricultural mode of existence. The World of the peasant was very different from that of the industrial worker. Here people were

> scattered in the countryside and towns were few. The few towns that existed were not industrial hubs but centres of trade or administration. The relationship between man and nature was heavily titled in favour of the latter - man worshiped nature. When man thought of controlling nature, it was mainly in fantasy, magic and traditional tales" (Mamdani, 1983:5).

The people in Buganda, where Wakisi sub-county is located, enjoyed a beautiful environment. Towards the end of the 19th century, a visiting British politician described the former Kingdom of Buganda as a fairy tale. In contrast to what he had seen in other places, he saw in Buganda, a different scenery and the vegetation a wonderful World. Instead of the breezy uplands, he entered a tropical garden (Hansen and Michael, 1988:4).

The indigenous local institutions had developed mechanisms which performed the co-ordinating and regulating functions in environmental resource management and use. It is these local institutions which were superseded by supralocal socio-political institutions with the inception of colonialism (Mung'ong'o, 1990). The Uganda Agreement of 1893 ushered in full British control of the country's administration and Britain declared Uganda a 'protectorate'. The long term interests of colonialism in Uganda could only be protected by a socio-economic and political system that would tie Uganda in the web of imperialist interests (Mamdani, 1983:6).

With the establishment of the mechanism of exercising political power, the next step was to re-organise economic life in Uganda to suit the interests of the colonial power. The peasants time and land were divided up. This was designed to make the peasant produce crops for his own consumption and export crops for British industry.

The environment of the colonies was degraded. The colonies were basically sources of raw materials which fed the industries of the colonial rulers motherland and simultaneously, such colonies were also markets for the manufacture of the colonial power(s). Consequently, the colonial economies were geared to the basic function of exploitation not to the development of the economies and people of the colonies (Lwanga, 1989:34).

Any infrastructure was designed to facilitate the movements of raw materials from the colonies, and therefore, any little development that did take place was incidental to the basic functions of the colonial economy. Non-governmental organisations were largely responsible for the development of the social infrastructure (Lwanga, 1989:34). Uganda's infrastructure was designed to facilitate the removal of raw materials like cotton, coffee, rubber, timber, cocoa and livestock. Even the emergency of an indigenous capitalist class was curtailed. As a result, the capitalist class was small, and what there was of it, in the commercial,

agricultural and forestry sectors was entirely alien, as most of the proletariat (Hansen and Michael, 1988:4).

The alien capitalist class was interested in exploitation of the natural resources and not their conservation. Hence, whereas the exploitation of forest resources was fairly advanced during the colonial period, very minimum effort was made to develop an institutional framework in conserving the forestry resource especially on the vast expanses of public land where crops like cotton and coffee were cultivated. The tendency toward preservation rather than forestry conservation especially on land belonging to the majority of the population can be seen from the statement by a Colonial Forester:

> "... when I took over my first forestry charge I was given a map showing the situation of the various state forests which I was to manage for production, but not the boundaries of any particular area of country in which I was to provide all the assistance which forestry could render to the community" (Brasnett, 1939:175).

Although foresters may have had the interst looks at tall aspects of forestry in the Colonial period, the nature of the Forest policies and the nature of the colonial economy could not warrant serious interest in forests and tres outside Colonial State forests. Consequently, the colonial period was a time of intensive exploitation of the natural resources such as forestry resources. This trend of exploitation is

well documented for the case of Karamoja (Mamdani, 1992) and Kigezi (Kagambirwe, 1972,)among others .

Cotton and plantation rubber, cocoa and later coffee production divided the country into "productive" and "non-productive" zones. Some areas in the country were demarcated as production zones, and these included Buganda. Others were designated "non-productive" zones and these were essentially for labour recruitment as we shall discuss in chapter three. This division led to dangerous political, social and environmental ramifications (Lwanga, 1989:35). These ramifications resulted in heavy demands on Uganda's Timber especially after 1941. It became obvious that attention would have to be paid to raising timber in plantation form if the future requirements of Uganda as a whole were going to be adequately met (Kagambirwe, 1972:39).

The pressure on forestry resources around Wakisi, especially demand for timber and fuelwood, intensified with the expansion of Jinja and Kampala Municipal Towns. The concentration of population in the two towns put a high demand on the forestry resources in the adjacent hinterland (Langlands, 1971b:37).

However, attempts by human beings to transform their environment have led to great vegetation changes and it is therefore hard today to speak of the natural vegetation of

Buganda. Nevertheless, geographical factors such as rich soils and an equatorial climate with an average rainfall of 2000 mm annual (Hamilton, 1987:7) originally gave rise to a luxurious forest vegetation which was far more extensive than it is today.

Historically, this kind of vegetation could have rendered Buganda unsuitable for cattle grazing and thereby limited the area of the Bachwezi influence to the west of the river Katonga. Further, this kind of environment afforded Buganda immense advantages in developing a settled agricultural community (Kiwanuka, 1971:32).

2.2 The Colonial State, Forestry Policies and Practice

The supervision of the Forestry Department in Uganda was started in 1898 by Whyte from the East Africa protectorate based in Nairobi. The Forestry Department was started as part of the scientific and Forestry Department. Its present name of "Forest Department" is a result of a number of changes. "The Forest Department" was established in 1927 (Kagambirwe, 1974:33).

Forestry Regulations were published in 1900. The regulations prohibited cutting of produce without a license except in land under private ownership and except for certain produce like building poles taken by natives for their own use under free permits. The regulations also fixed fees for

produce and made burning of forest or bush an offence (Uganda, Forest Manual, Undated:227).

The Forest Regulations marked a fundamental change in the local management of forest resources. The indigenous people were alienated from their resources (Mamdani, et al, 1992:30).

The earliest commercial activity in the forests of Uganda was the collection of wild rubber from *Landolphia* and *Clitandra* vines and later from the tree *Funtumia elastica*. Some forests in which the harvesting of timber began early include Munziro (Namala/Tero) in 1907, Mbiro (1911) and Budongo (1919). In the period up to 1926 much of the harvesting was undertaken by the colonial government (Uganda, Forest Department, 1930).

However, the exploitation of forestry resources started much earlier than the harvesting of timber. And in 1904 the need to carry out some afforestation to replace wood being cut for fuel was first noted as the railways, lake steamers and various industries were already making heavy demands on the supply. The steamers, railways and industries were set up for the basic function conveying raw materials and half-processed goods to British industries (Lwanga, 1989:34).

In response to the demand for forestry products, the colonial Forest Department embarked on acquiring land which was gazetted as Forest Reserves (Hamilton, 1987:46).

In Buganda the legal basis for the colonial government management of forests was the Uganda Memorandum of Agreement (1900) and the Forests Ordinance (1913). All large blocks of forest were declared Crown Land and 1500 square miles, approximately 400,000 hectares, came under the control of the colonial administration.

The Toro Agreement (1900), Ankole Agreement (1909), and Bunyoro Agreement (1933) declared all forests in the then kingdoms to be under direct colonial government's administration. These various agreements along with others, such as the Uganda Memorandum of Agreement (1900) prohibited the exploitation of Crown forests without permits, fixed fees, and stipulated items which could be extracted without payment, the later including firewood and poles for private use. Thus, again the colonial government alienated the forestry resources from the "original" owners.

By the 1930s a policy had evolved which gave the colonial government the task of regulating the volume of timber cut. The extraction and processing of timber was in private hands. These private firms were owned by settler capitalists. The commercial firms of the settler capitalists

were granted felling licences over defined parts of the forest estate for prescribed period of years, licences being given in return for fees payable to the colonial Forest Department per volume of sound timber cut. The revenue from timber went into the treasury of the colonial state[1] (Hamilton, 1987:47).

Despite the importance of the forestry resources as a source of revenue for the colonial government, almost no attempt was made to put the resource to proper management until the 1930s. Efforts by people like Troup (1922) and Nicholson (1929) were underplayed (see Appendix V). Indeed Nicholson observed that the Protectorate of Uganda had immense agricultural potentialities the full development of which could only be carried out with the assistance of the handmaid of agriculture, forestry. He concluded that if the latter's lot be prostitution Uganda would become a sterile solitude. (Uganda, Forest Department, 1930).

Nicholson stressed the fact that forests and trees play important roles in the environment, both in direct economic ways and indirectly by modifying the climate, protecting water supplies, and preventing excessive soil erosion. He believed that Uganda would benefit from a greater forest cover than it had even at that time, and advocated not only widespread forest protection but also major afforestation schemes. He contended that supplies of firewood, poles, and

sawn timber for local consumption in the countryside could best be guaranteed by encouraging tree growing by farmers and by establishment of small plantations under the control of local administrations (Uganda, Forest Department, 1951).

Many of Nicholson's suggestions regarding the objectives and functions for the Forest Department were incorporated in an official Forest Policy statement of 1948 (see Appendix VII). However, the 1948 Forest Policy Statement showed a trend toward the down grading of the value of protective forestry in recognition of the pressing immediate colonial demands of agriculture. In the words of the Forest Policy Statement "because of Uganda's dependence on agriculture, the rapid development of the country and the continuing increase of it's population, it is necessary to limit the size of the forest estate to the minimum area which will achieve the primary aims of management". (Uganda, Department of Forestry 1948).

Emphasis on forestry management was put on the forest estate under colonial administration. As a result, an attempt to establish communally owned village forests failed miserably in the early 1950s (Sangster, 1951). What ensued was characteristic of what Thomas and Scott had described:

> "Soil erosion has been greatly accelerated by the introduction of cotton, which is responsible for adding a million acres of agricultural land to that formerly cultivated. This land is

> exposed for several months to heavy rainfall and until the plants grow tall to intense sun. Erosion is not so serious in Buganda and Busoga where the red soils are found and where cotton blocks on the scale general in the Eastern Province are not common. It is, however, a problem which is likely to become of first importance in certain areas, particularly those carrying an increasing animal population" (Thomas and Scott 1935:116).

In Buganda the expansion of agricultural lands for the production of cash crops especially in the 1950s, - cash crops for the colonial economy, often meant the clearing of forest areas. The effect of deforestation is not only soil erosion but also greatly diminishing the availability of fuelwood. Thus, prices of firewood and charcoal simultaneously went up with enhanced agricultural land expansion. This trend degraded the incomes of the local population as firewood and charcoal became commercialized. In the case of Wakisi sub-county large quantities of green biomass was reduced to charcoal and ashes (Chaudhry, 1984:93).

Concluding Remarks to Chapter two

The penentration of capitalism in pre-colonial societies in Uganda in general and Wakisi sub-county in particular, had the immediate effect of dismantling the forestry resource counservation mechanisms that envolved over several generations. The introduction of the intensive cultuation of crops such as cotton had the effect of opening up land for

long period leading to deforestation and soil degradation. Thus the traditional methods of resource conservation were eroded and washed away. The colonial state[1] policies such as the division of the country into "productive" and "non-productive" led to the concentration of people into particular areas leading to further pressure on natural resources, particular forestry resources. Even the colonial state Forestry policies that were instated to try and hat deforestation trends were not able to solve the problem of deforestation. The major reason for failure of colonial State Forestry Policies was that they sought to protect the forestry resources against the people and not for the people. This legacy of forestry resource conservation was inherited and cherished by the past-colonial state as well shall discuss in the following chapter three.

Notes

1. For the theory of the colonial state see: Brett E.A. 1972. Colonialism and Underdevelopment in E. Africa, London: Heinemann.

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CHAPTER THREE

THE POST-INDEPENDENCE FORESTRY MANAGEMENT

3.1 The Inheritance of Forestry Resources at Independence

At the time of Uganda's independence (October, 1962), the country's Forest Department was one of those institutions which followed British tradition; and forestry was practiced by the Forest Department as an applied forestry management science. Forestry management was a systematic body of ideas and techniques quite different from anything which existed in Uganda prior to the country's contact with western influence (Hamilton, 1987 : 17). The Colonial management of forestry resources had stressed exploitation rather than conservation and this "tradition" was carried over by the post - independence government. Consequently, the post-independence Uganda government's forestry resource management approach and system was guided by such technical system of management. The future projections of forestry resource requirements, for the nation in the first decade after independence, give an insight into this trend as shown in the following table 1.

Table 1: Consumption per head per year of Wood products in Uganda (tons)

	FAO Estimates for 1859- 61 period	Uganda Forest Department Estimates for 1965-68 period
Fuelwood (including Charcoal)	1.48	1.29
Roundwood	0.10	0.092
Sawn Wood	0.0126	0.0167
Paper/paper board	0.00038	3.5

Source: Hamilton (1987)

The figures clearly show that while the Forest Department was anticipating a fall in the consumption of fuelwood per head/capita per year at the same time the Forest Department was busy working for an increase in the consumption of paper products. As it has been discussed earlier on in this study, the consumption of firewood instead of going down has always been taking an upward trend. Hence, the concentration of departmental efforts on the management of tree plantations underplayed the trend of environmental degradation which had been inherited from the colonial state.

By 1958, extensive parts of Uganda (estimated to cover about 40% of the country) were suffering from an acute shortage of good agricultural land. In that year, 13 percent of potentially cultivable land in Uganda was actually cultivated. Whereas this figure seems quite low, in some

parts of Bugisu and parts of Buganda such cultivable land which was all cultivated went as high as 71.5 percent of potentially cultivable land (Langlands 1974).

The extent of forests in Uganda for almost sixty years, during the present century, is shown in Table 2. The figures represent an indicative picture of the rate of deforestation. It is important to note that this trend of deforestation was not just due to smallholder farmers (peasants) but also for other activities like the establishment of ranches, tea estates, sugar-cane estates, among many others contributed to the deforestation trends.

Table 2: **Forest Cover in Uganda A.D. 1900 to 1958**

Date (A.D)	Area of forest and moist thickets (km^2)	Percentage of forest & moist thickets of total Forest Reserve area
1900	30901	12.7
1926	26277	10.8
1958	11176	4.6

Source: Langdale (1960)

A decrease in the percentage of forest and moist thickets from 12.7 per cent in 1900 to 4.6 percent in 1958 showed a drastic reduction in the forest cover. By the 1960s, there were indications that the tree planting programme needed to be enhanced or accelerated so as to prevent the development of a serious shortage of fuelwood, timber and

other forest products. This can be extracted and concluded from the contents of three reports on forestry development in Uganda (UNESCO, 1964; FAO, 1967; Lockwood Consultants, 1973).

The deforestation trends of the early 1960s were against the background that the period 1930 to 1960 had been one of considerable evolution of cropping the natural forests for timber a field which Uganda came to be recognized as a leader among tropical countries. It is even unfortunate that the Forest Department considered some of the commonest species of tall trees such as **Cynometra alexandri** and **Parinari excelsa** has having low commercial value. Arboricides were introduced in 1954 to kill these "weed trees" (Hughes and Langdale, 1962). The killing of good timber trees like **Cynometra alexandri** was aggravated by the introduction of Monocyclic felling, commercial fuel-gathering and charcoaling in the South Mengo forests, where Wakisi Sub-county is situated, lying close to the major Urban centres (Kampala and Jinja) of South central Uganda (Dawkins, 1958; Philip, 1962).

Compared to the Colonial period, the first decade after independence, that is 1960s, saw the development of an advanced system of forestry resource management especially with regard to Uganda's natural high forests. A well controlled system of work-plans and logging was established followed by refinement for charcoaling activities and enrichment planting (Uganda, Forest Department, 1988 :4).

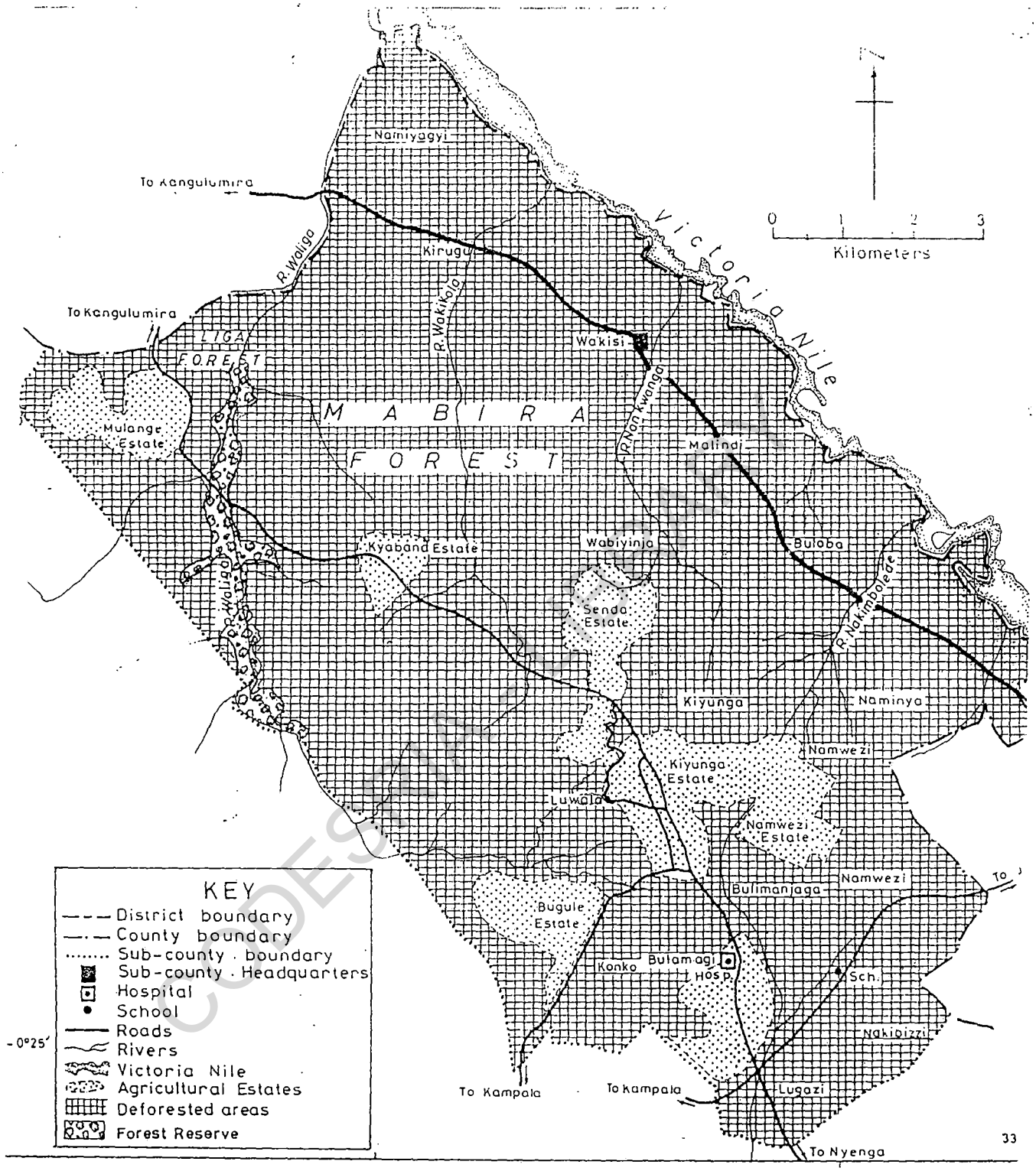
However, the system of forestry resource management was soon washed away by the socio-economic and political situation that followed the period of the early in 1960s. For the case of Wakisi sub-county the good forest cover of about 90 percent (see Map 4) was rapidly eroded.

3.2 Forestry Resource Conservation in the Context of Uganda's Socio-Economic and Political Environment

The future of forests and trees in Uganda, and a proper management of the environment will largely depend on coming to grips with the socio-economic and political factors. It is important to understand the past in order to plan for the future. This is even more so bearing in mind that Uganda, had, when independence came in 1962, a well developed administrative system and a prosperous economy.

The country was more or less self-sufficient in terms of food for the population. The export of coffee, cotton, tea and some minerals were increasing rapidly even if Uganda suffered from the same lack of balance in its foreign trade as many other colonies. Cotton and coffee accounted for over 80 percent of Uganda's exports (Mamdani, 1983).

From the mid 1960s, the country slid gradually into disorder due mainly to mismanagement within the government system. The situation deteriorated into a conflict partly between the central Government and Buganda and partly between


Namiyagyi
To Kangulumira
R. Waliga
Kiruga
R. Wakikoja
Victoria Nile
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To Kangulumira
LIGA
FOREST
Wakisi
R. Nan Kwanga
M A B I R A
F O R E S T
Mulange Estate
Malindi
Kyaband Estate
Wabiyinja
Buloba
R. Nakimbolege
Sendo Estate
Kiyunga
Naminya
Namwezi
Kiyunga Estate
Luwala
Namwezi Estate
Bulimanjaga
Namwezi
To
Bugule Estate
Konko
Bulamagi Hosp.
Sch.
Nakibizzi
To Kampala
To Kampala
Lugazi
To Nyenga
KEY
District boundary
County boundary
Sub-county boundary
Sub-county Headquarters
Hospital
School
Roads
Rivers
Victoria Nile
Agricultural Estates
Deforested areas
Forest Reserve
0°25'
33

Obote's Party (the Uganda Peoples Congress - UPC) and the Buganda based party (Kabaka Yekka) which was mainly a Buganda Party which stood for the supremacy of the Buganda King-the Kabaka.

In 1967, the forest services which previously were run by Local Government Administrations were abolished and integrated into the centrally organized Forest Department. This integration was not necessarily prompted by any direct considerations of forestry resource use but was rather a design to implement the general shift towards political centralization which followed, especially, the 1966 political crisis. The Uganda Forest Department Report for 1964-68 asserts that the abolition of Local Forestry services was appreciated by most people who were interested in forestry on the basis that the Forest Department would ensure efficiency and rationality in the development of forest resources. The assertion by the Forest Department was quite unfortunate especially when the trend of deforestation that ensued is critically examined.

Throughout the 1960s, the Forest Department put emphasis on plans to amend the existing colonial Forest Policy which was inherited at independence in 1962. It was not until 1970 when the Department succeded in changing the 1948 Forest Policy Statement. A new forest policy Statement (The 1970

Forest Policy Statement) was issued in favour of the 1948 Forest Policy Statement.

The conservation policy of 1970 mentions Wildlife Protection, and establishment of Amenity Forests; and helping farmers, organisations and other people to grow and protect their own trees (Uganda, Forest Policy, 1970). Nevertheless, the overtone of the new forest policy remains the sustained products of timber and other productions for the needs of the country and where feasible for export (see Appendix VIII).

The fact that the Government had made no policy changes immediately after independence up to 1970, and yet it had made changes in the Forests ordinance of 1913[1] indicates the emphasis put on the law. The work of the Department was mainly to supervise exploitation, protect forest reserves against illegal exploiters, to arrest culprits, prosecute and datain.

Although a sub-section was added to the 1970 Forestry Policy Statement to address private tree-planting the down grading of peasant participation in Forestry conservation haunted the Forestry Department as can be perceived from the following statement:

> "There are other secondary objectives such as the protection of water catchments, soils, wildlife and amenity of land. These however canot be measured and are dependant on responsible

> behaviour by Departmental officials in their provision" (Lockwood Consultants, 1973).

It may never have occurred to the group of Lockwood Consultants that the very Departmental officials had been brought up in a culture and tradition that did not fully appreciate the use of forests in the sense of an amenity of land.

The period beginning about 1973 up to 1978 witnessed an enhanced deforestation trend and major erosion of the effectiveness of the Forest Department. The same period witnessed a near total collapse of the governmental information system on major national issues (Hamilton, 1987:59).

With the crisis in forestry management looming, the Amin Government hired the services of Lockwood Consultants to examine the problem. In 1973, Lockwood Consultants on contract from the Canadian International Development Agency (CIDA) worked in collaboration with the Uganda Forest Department.

The early 1970 was a period of "total confusion" in the management of the forestry resources. With the expulsion of all 'Asians' from Uganda by the Iddi Amin regime, all Ugandan sawmills that had been owned by the settler capitalists who were almost all of Asians Origin, were deserted abruptly.

This led to the establishment of the Uganda Government Sawmills Project (UGSP) for the sole purpose of managing and operating the then deserted Sawmills. Later on, in 1974, the quasi - government Wood Industries Corporation (WICO) was formed. The primary object for WICO's establishment was to boost the exports of timber to comparable level and prominence of coffee and cotton exports in terms of foreign exchange generation. Meanwhile, the functioning of the Forest Department was rapidly degenerating due to political chaos and economic hardships. A good number of the department's members of staff were openly and actively involved in the plunder of the Forestry Resources. The Chief Conservator of Forests in 1974 had Warned all Forest Department Staff including Forest Guards as follows:

> "I have been extremely disturbed to learn that some of you have involved yourselves in the legal felling and selling of logs from Forest Reserves and public land. In most cases, logs have been illegally transported on vehicles belonging to the Sawmill Project" (Uganda Forest Department Report, 1974).

The state of the economy during this period was to say the least pathetic as can be deduced from the data in the following table 3.

Table 3: Rates of growth, 1973-76 (in % age)

Year	GDP	Monetary Economy	Cash agricultural output
1973	-1.2	-3.6	-6.2
1974	-2.0	-4.0	12
1975	-2.2	-4.8	-
1976	-0.4	-	-0.4

Source: Mamdani, 1987

The increase in cash agricultural output from -6.2 percent in 1973 to 12 percent in 1974 was partly due to Amin's self-declared "economic war" and later partly due to the double food production policy. Nevertheless, the monetary economy continued to deteriorate into a pathetic state.

One of the most dramatic events of the 1970s was the Land Reform Decree of 1975. The effects of this decade became very apparent when people who came to be known as "mafutamingi" (the mini-millionaires) grabbed land in those parts of the country where land scarcity and social differentiation were relatively advanced; such as Wakisi sub-county in central Uganda (Banugire, 1989).

The peasants so harassed and evicted must have seen it as a golden opportunity when Amin directed in the name of the "double food production" campaign that people could enter Forest Reserves and cultivate (Hedberg, 1991). As life in towns became more and more unbearable, many families migrated

to the villages. Most peasants abandoned the production of "cash crops" and turned to food crops that could be easily marketed (Mamdani 1983: 48/49). In Wakisi Sub-County the place where alternative food crops (especially bananas) were grown as a tradition was in the area of the Forest Reserves, particularly so in the case of Mabira Forest Reserve.

In 1978, the gazetted area of Forest Department land stood at 15280000 ha. including about 732000 ha. of Savannah woodland and 24000 ha. of plantations (10,000 ha. of which were softwoods). Approximately 300,000 ha. of the forest estate estimated to have slipped out of the forest departments control over the 10 year period from 1972 up to early 1982, representing an annual compound loss of about 2 percent total Government Forest estates/reserves. (Hamilton, 1987:61).

The Mukono district Forest Department Annual Report for 1977/78 indicates that permits to reside and cultivate within Mabira Forest Reserve were issued to encroachers in Blocks 173, 179, 180, 181 and 182. No wonder at the close of this period about 2000 people were settled in North-East Mabira in Wakisi Sub-County. At the centre of these developments, Amin's government was ousted in 1979 leading yet to another series of political confusion and further economic decay. Ten years later, a Forest Department Report described the situation as follows:

> "Mabira Forest (29693 Ha) was first attacked by ex-service men in 1946. They needed land for agriculture and resettling. This wave of forest encroachment was quickly resolved by getting alternative land outside Mabira. From 1976 to 1978 extensive areas of Mabira forest were cleared for agriculture. About 1/3 of the forest was converted into an extensive field of Matooke (Bananas). Over 3500 families, originating from different parts of Uganda, as well as from neighbouring countries, had done the havoc. Obviously, a lot of forest produce and money was foolishly wasted" (Uganda, Forest Department Report, 1990:4).

At the beginning of the Obote II government in 1981, the economic and political chaos had grown into great dimensions, such that everybody involved in forest exploitation (or plunder) seemed uncontrollable. The new Obote II government slammed a temporary ban on pitsawing and charcoaling. The ban was announced on Radio Uganda by the Minister of State for Agriculture and Forestry. All existing licences for pitsawing and charcoaling were hence forth cancelled (Uganda, Mukono Forest Department, 1983).

Throughout the period 1980 to 1986, Forestry resource management was basically directed through radio pronouncements. At the end of it all, a Forestry Department Report (1990 : 4) concluded that extensive damage to Mabira Forest Reserve was possible because of lack of logistical support in the form of funds and transport for Forestry Department staff, and lack of "decisiveness" on part of government to put a halt to all forms of forest destruction.

However, the fact that is unfolding itself is that the Forest Department itself was guided by deficient or weak policies which were not integrated in the national development fabric.

Following the overthrow of the Obote II Government, the new government of President Museveni evicted encroachers from the Forest Reserves in 1989. However, even today, the encroachment problems are not over. This is quite lucid from a recent New Vision Report:

> "President Yoweri Museveni has directed District Administrators in the country to ensure that any person found cutting down trees in forests is arrested promptly. Mr. Museveni blamed the current problem of deforestation in the country on the use of charcoal as fuel and corrupt forest officers, policemen and RC (Resistance council) officials who have been recruited into what he called this shameful act (Uganda, New Vision, September, 2, 1991 : 1)

From the foregoing, it is important to reiterate that deforestation in Uganda has been and still is a historical process which has been greatly propelled over several decades, by socio-economic and political factors.

The work done so far by the NRM Government since 1986 is very commendable. The Government has tried to address deforestation trends in the country by instituting several measures. These efforts have apparently culminated in the National Environment Action Plan (NEAP) Draft Paper (1992). The NEAP has as its first objective to enhance health and

quality of life of all Ugandans through sound environmental management (National Environment Action Plan, 1992 : 3). The other objectives include: to preserve and/or restore the equilbrium of econsystems and maintain ecological processes and life support system; integrate environmental concerns in all developmen oriented policies, planning and implementation at national, district and local levels. Further to reduce waste and achieve a sustainable level of resource consumption.

Although the objectives of the National Environment Action Plan look impressive, the task at hand is the implementation of the said objectives. The undertone of the policy documents, especially in its Policy Statement, is a reversal of Colonial State Policies which emphasized the protection of Forest areas under State Control. The tendency of policy implementers has been, as discussed earlier in this section, to implement legislation in the protection of forestry resources rather than helping peasants to develop mechanisms that can help them to conserve forestry resources to meet their basis needs for food, fuelwood, fodder and construction materials such as building poles. The tendency by state to emphasize legislation rather than a participatory approach in forest resource conservation is quite lucid from a New Vision Report:

> "President Yoweri Museveni said over the weekend that Government is enacting environment protection laws which will

> be implemented more effectively than through mere education seminars. The President said that the laws will compel each land owner to plant trees in and around their land. He further said that it will also be compulsory for land owners to plant trees of their choice covering a tenth of the land. ... Museveni told the avoidance that experience had shown that the enforcement of the environment protection measures needed no more compromise through appeals to people to plant trees and preserving what is existing" Uganda, New Vision, April 28, 1992).

Contrary to what the New Vision report portrays, deforestation in Uganda has not been due to conflict between the environment and people but a conflict between people. There are several factors that lead peasants to over-exploit their environment. And unless these factors, which are discussed in Chapter four of this study, are understood and integrated into forestry conservation strategies, any amount of legislation will only be a cosmentic solution to the problem of deforestation.

3.3 Population Trends and its Impact on Forestry Resources

Throughout history, the peoples of the world have been characterised by migrations and increase in numbers through births. Uganda's experience in this is no exception. In pre-colonial Uganda, communities moved from one part of the country to another often during and through war and conquests. Sometimes people migrated from one place to another in search of new resources such as better pastures

and/or richer farm-land. Whatever the nature of these movements, the system seems to have been self-sustaining.

During the colonial period, migrations continued but this time under a deliberate colonial Government policy of dividing the country into different "production" zones. The Southern part of the country, especially Buganda where Wakisi Sub-county is located, had settled communities long before the colonialists came. As a result the South was more developed than the North.

> "The North-South division of the country was further entrenched by the way economic life was organized in the colony. Building upon pre-colonial differences Britain turned the Southern part (Buganda, Busoga and Ankole) into Cash-Crop growing areas. But cash-crop production was officially discouraged in the northern areas (West Nile, Acholi and Lango) and in Kigezi in the West, from whence were recruited not only soldiers and policemen but also workers for factories and plantations in the South (Mamdani 1983 :10).

The effect of this policy was that it precipitated deep economic differentiation between the South and North and Eastern parts of the country. As a result more people moved from the North and Eastern parts of the country to look for employment and better standards of living.

By the early 1870s several immigrant communities of Basamia, Bagisu, Badama and Balongo had settled in Eastern Kyagwe where Wakisi Sub-county is located and today they form

nearly 50 per cent of the population in this area (Kiwanuka, 1971 : 25 - 32).

The following tables 4 and 5 show the population trends over the ten year period between 1959 and 1969.

Table 4 shows the changes in population from 1959 to 1969 and density of population per square kilometer. Wakisi sub-county is situated in Kyaggwe country in the former kingdom of Buganda.

Table 4: **Population densities 1959 - 1969 by Counties (Total Population - African and Non. African)**

1969 Code	District/ County Name	Land Area (1969) Sq.km	Population 1959	Population 1969	% increase	Age 1959	Density Sq km 1969
	East Mengo						
110/1	Kyaggwe	3099	278853	370059	32.7	90	119
112/3	Bulemezi	5788	220146	268039	21.8	38	46
114	Bugerere	1693	87940	162739	85.1	52	96
115	Buruli	3190	23303	47165	102.4	7	15
116	Buvuma	270	2406	3581	49.6	9	13
	Total	14040	610242	851583	39.6	43	61

Source: Langlands (1974)

The increase in population in Kyaggwe over the ten-year period (1959-69) was 32.7 percent. Although this population growth is much lower than that of Buruli (102.4 percent) and Bugerere (85.1 per cent) over the same period, it nonthelesss represents a significant increase. This increase in

population was not only an increase in numbers of new **births** in the area but was also greatly enhanced by migratios as has already been discussed earlier in this chapter. The following table 5 illustrate this point.

The former district of East Mengo in the former kingdom of Buganda showed a high percentage (22.6 per cent) of Ugandans who had migrated into the area over a ten year period. The East Mengo figures were rivalled only by Kampala, and Mbale which had developed as commercial centres. The increase in Mubende could have been due to the green pastures for cattle.

The number of people born out of Uganda who had moved into the former districts of East Mengo, Kampala and Mbale show a similar trend to that of Ugandans born outside these districts. Although no precise exact figures are given for Wakisi sub-county the overall picture for the former district of East Mengo where Wakisi sub-county located explain the movements of population in the sub-county over the decade.

Table 5: **African Population (Ugandan and Non-Ugandan) by Place of Birth**

District	No born in District now Living in	% age of total popu-lation	% Age of Uganda Popula-district that present living in	No. born in but in of different	% age outside of	No born of Total	% age Total (in Uganda	Total C.N.S)
West Mengo	349685	69.5	90436	17.7	70156	13.7		510277
East Mengo	519101	61.3	191334	22.6	136554	16.1		846989
Masaka	486467		76.4	53467 8.4	97086	15.2		637020
Mubende	203870		61.8	78999 23.9	47133	14.3		330002
Kampala	inc.in next column			241130 82.2	52198	17.8		293328
Bugisu	368644			18980 4.8	9825	2.5		397449
Busoga	733398		82.4	100744 11.3	55850	6.3		889992
Sebei	56044	87.0		3872 6.0	4514	7.0		64430
Mbale	inc. in next column			16461 89.6	1913	10.4		18374
Kigezi	617208	95.4	10189	1.6	19321	3.0		646724
Tavo	437681	77.1	71799	12.6	58421	10.3		567901

Source: Langlands (1974)

(Adapted from 1969 census, Vol III Table 4) African Population (Ugandan and Non-Ugandan) by Place of Birth.

The migrations led to pressure on the natural resources especially in Wakisi sub-county in East Mengo. This was aggravated by a high population density as the following table 6 shows:

Table 6: **Cultivable Land-By Population and Counties 1959-69**

Code No	Country	Cultivable Area sq.km	Rural Population (1969)	Rural Population 1959	Density per sq. km 1969	1959
	East Mengo					
110	Kyagegwe	2404	355524	274608	148	114
112	Bulemezi	5240	263406	217540	50	42
114	Bugerere	1424	161005	87201	113	61
115	Buvuli	2746	47165	22792	17	8
116	Buruma	233	3581	3581	15	16

Source: Langlands (1974:61)
Note: Cultivable land is here very broadly defined as a land, minus that land in swamp, forest or in game reserves or in Urban use in 1969 and minus high altitude.

By 1969 the three northern counties of Bugerere, Buruli and Bulemezi had considerably lower densities than the large Southern county of Kyaggwe where Wakisi sub-county is located.

As have already discussed in Chaptr two the establishment of tea estates and sugar-cane plantations led to the influx of migrant workers along the line of the axial road from Kampala to Jinja. Southern Bugerere, which is just north of Wakisi sub-county, after the early 1950s, became a major attraction for migrants from Bugisu, Teso and West-Nile (Langlands, 1974:33).

Evidently, Kyaggwe, where Wakisi is located, has been a prosperous zone in South Buganda. The main factors for the prosperity included the cultivation of coffee, cotton, bananas, tea and sugar cane, and its proximity to both the capital city of Kampala and the industrial complex of Uganda: Jinja. Commenting on this population growth, Langlands observed:

> "The central parts of East Mengo, Comprising central and north Kyaggwe, South Bulemezi and South Bugerere appear to carry fairly heavy populations and the implication is that the land is already fairly fully utilized. Whilst some of this came about by immigration in the last 20 years, obviously not much good quality agricultural land with high rainfall is left for future development in the central zone of East Mengo. Indeed it might soon be appropriate to ask whether the retention of high forest

> in this area provides the best economic return for what is potentially good agricultural land" (Langlands, 1974:35).

The statement potentially good agricultural land was illogical since it is now common knowledge that once these Forest Reserves are cleared the soils lose fertility very fast. Further, the years from 1975 upto 1989 witnessed severe encroachments into the Forest Reserves for the search of fertile agricultural land. As already mentioned, one of the reasons for this was Idi Amin's Policy which allowed people to move into and cultivate in Forest Reserves.

3.4 International Cooperation: Foreign Aid and Forestry Development in Uganda

After independence, the post-colonial government had to struggle to build the economy. Apparently this has been the "struggle" for all post-independence governments in Uganda upto now.

In the mid-1966 the Uganda Government approached the British Government for assistance in joint investment between the government of Uganda and British monopolies. The Uk High Commissioner of Uganda ruled out charcoal and rubber projects. The reason for this was that charcoal and rubber projects would use too much local material and too little British imports (Mamdani, 1983:26). Hence, the production of charcoal and rubberfor the purpose of developing the Uganda economy was not in the intrest of the British Government.

The trend of development projects especially forest conservation projects, have continued to be influenced by internal and external politics. the Norwegian Agency for International Development (NORAD) became involved in Forestry programmes in Uganda in the late 1960s. Their main tasks were to improve on the status of Nyabyeya Forestry College and to start a Department of Forestry at Makerere University. By 1970 NORAD had established a **Pinus Caribaea** plantation at Katugo, equipped Nyabyeya Forestry College and opened a Department of Forestry at Makerere University. Due to the prevailing political situation in Uganda at the time and the growing international discontent towards the government of the time, in April 1973 the Norwegian Government withdrew aid from the country. The projects that had been started by NORAD almost came to instant collapse. The events that followed characterised the deteriorating overall economic and political situation in Uganda in the 1970s.

The International Development Association (IDA) Agricultural Rehabilitation Project was initiated after the overthrow of Amin, in 1983. The aims of the Project (ARP, Credit 1328 UG 1983) was to finance inputs, equipment for rehabilitation of the export industries, and studies. The Agricultural Development Project (ADP cr. 1539 UG) which was co-financed by the Uganda Government and IFAD cost US$30 million in total. It was to proved inputs for farmers in seven districts. The project also included several small

research or pilot institution building components. It included US$ 102,000 for provision of forest nursery equipment (Uganda, Forest Department, 1988:9).

An Energy sector Report (No. 4453 of July 1983) carried out for Uganda under the joint UNDP/World Bank Energy Sector Assessment Programme identified the problem of deforestation and fuelwood supply shortages around urban areas (Uganda, Forest Department 1988:10).

However, the IDA and IFAD efforts did not yield much forestry conservation strategies. In 1985-86, only 0.25% of the national recurrent budget, or Ushs. 648 million was allocated to the Forest Department. Efforts to address this downward trend in financing forestry development during Obote II regime had been slow partly due to political instability and partly due to corruption. As a result the projects did not have any appreciable impact on addressing the deforestation trends in Uganda. The Management of the Forestry resources continued to deteriorate.

In line with the Energy Sector Report, the IDA Agricultural Sector Memorandum (Report No. 5044 - UG of July 30, 1984) emphasized the problem of deteriorating management of the forest resource base and the need to reverse the trend of forest degradation. As a result the Uganda Government identified the need for reforestation as a priority and

requested USAID to identify a forestry project in late 1984. The Bank Energy Sector Management Assessment Programme (ESMAP) with Canadian financial assistance prepared the

Project in 1985. Then in July 1986 an IDA mission with the help of EEC consultants appraised the project.

The Result of the appraisal was the Forestry Rehabilitation Project (FRP) which had the following objectives:

1. Peri-Urban plantations and pilot wood farms
2. Farm Forestry
3. Natural Forest Management Rehabilitation
4. Softwood Plantation Rehabilitation
5. Rehabilitation of the Forest Department
6. Training
7. The main donor Agencies included: IDA, DANIDA, EDF, UNDP, NORAD, CARE and Government of Uganda.

The FRP is facing problems of management, poor accountability, delayed procurement failure to achieve planned targets, illegal extraction of forest produce from Forest Reserves and lack of proper co-ordination of all the Project Components Uganda, (Forest Department Report 1992). Inspite of the problems such as poor accountability which the FRP is facing, all the Project Components are still in operation except the Farm Forestry component. The reasons

that caused the termination of the Farm Forestry component of the FRP are quite contradictory. However, the main reason is a conflict between the donor Agencies and the implementing Agency, the Government of Uganda according to the New Vision Report:

> The Farm Forestry Project has stalled following the termination of the funding by the Danish International Development Agency (DANIDA). The project, worth US 7.5 million dollars, started in 1989. .. The report of the appraisal mission, which was released in July, among other things, recommended that the arm of the World Bank. .. While the letter by the Danish ambassador, Mr. G. andersen, dated December 4, 1991 to the secretary for Environment Protection alleged that the termination of the funds to the project was pre-empted by poor accountability of the funds" (Uganda, New Vision Report, January 21, 1992).

The failure of a Forestry Project that was supposed to benefit the peasants comes as no surprise given the historical development of forestry conservation in Uganda. The tendency has always been to emphasize the sectors that appeal to the demands of policies that relegate the peasants to periphery (Mamdani, 1987:15). A detailed analys of the Farm Forestry Component will be presented in Chapter four of this study. Suffice it to say here that there is need to tranform the Forest Department toward an appreciation of involving the majority of the forestry resource users, the peasant, into the management and conservation of the forestry resources.

Concluding Remarks to Chapter Three

At Uganda independence in October 1962, the post-independence Uganda Government inherited a set of forestry policies, laws, institutions and practice from the British Colonial Government. Throughout the period of post-independence upto the present time there has been no transformation of the colonial forestry practice. As a result the problem of deforestation that was exacerbated by the colonial government has continued to this day. The socio-economic and political turmoil of the post-independence has been the crux of deforestation in Uganda in general and Wakisi sub-county in particular. Even the efforts by International Aid Agencies in forestry conservation have not addressed the fundamental issues that would help reduce or even half deforestation trends. In the next chapter four, are shall discuss how the various have been at play in Wakisi sub-county and how they have enhanced deforestation.

Notes

1. After independence to the Word Ordinance was changed to Act, hence the Forest Ordinance became the Forest Act.

2. For the theory of the Post-Colonial State see: Brett, E.A. 1972, Colonialism and underdevelopment in East Africa, London: Heinemann; Mamadani, M. 1976. Politics and Class Formation in Uganda, London: Heinemann.

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CHAPTER FOUR

ANALYSIS OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

The analysis in this chapter four draws mainly on the field data. Also some reference in the analysis is made to the theoretical framework in chapter one and the historical analysis of the problem presented in chapters two and three. Otherwise, where appropriate, the analysis has taken a historical perspective. The major historical issues have already been discussed in chapters two and three. As such, this chapter will be confined to an analysis of the current situation in Wakisi sub-county the research data collected by the author from the area. The period comprehensively covered in the analysis is from 1986 to 1992.

In section 4.2 the author discusses the dynamics of forestry resource exploitation and how it is impacted upon, or affected, by population pressure, typed and level of technology, labour and social relations. Section 4.3 deals with the cultural and economic dynamics and State Management of forestry resources especially in respect to culture, gender, agricultural practices livestock production practices, income levels, ownership rights of land, capital and trees and how they relate to afforestation. Further, factors such as

education, and skills and how they affect deforestation and forest conservation, are covered in section 4.3.

The relationship interaction between the community in Wakisi sub-county and the State[2] in forestry resource management is presented and analysed in section 4.4. Section 4.5 explores the role of Foreign Aid, Non-Governmental organisations (NGOs) and Forestry Conservation Programmes in transforming the nature of existing local forestry resource management practices and in solving the problem of forestry resource depletion in Wakisi sub-county with special reference to National Forestry Conservation framework.

4.2 THE DYNAMICS OF FORESTRY EXPLOITATION

This section is an analysis, drawn from the research findings of how population pressure, level of technology, labour and social relations bear on forestry resources in Wakisi sub-county. Further, the author analyses how the above mentioned factors affect deforestation in the context of the theoretical issues discussed in chapter one to three.

4.2.1 Population Pressure

Demographic factors such as migration, fertility and popuation density are crucial in understanding the deforestation problem in Wakisi sub-county. However, the author does not consider demographic factors as being solely responsible for the depletion of forestry resources in Wakisi

sub-county. In this study population pressure is just one of the factors responsible for the depletion of forestry resources. The other factors will be discussed in the subsequent sections.

In this section demographic factors have been analysed in an integrated manner to include issues such as increase in human populations over time, Migration influences and the composition of the human population particularly in terms of age and gender. In addition, population density per square kilometer (sq.km) has been vital in understanding how demographic factors affect forestry resource use and hence deforestation.

In Wakisi sub-county population pressure is a big factor in determining forestry resource conservation. An analysis of population density is therefore imperative.

The critical population pressure in Wakisi sub-county has been contributed partly by new births. The population has risen from 23139 in 1980 to 28133 in 1990 (Uganda, Population census 1980, 1990). However, as discussed in chapter three, a lot of people moved into Wakisi sub-county from other parts of Uganda and neighbouring countries such Kenya, Sudan, Rwanda and Zaire in 1960s and 1970s.

In the 1980s the population that entered Mabira Forest Reserve to settle and cultivate exacerbated the problem of forestry resource depletion and hence deforestation. Out of 3506 households that were in Mabira Forest Reserve by 1987, 210 households had migrated from neighbouring countries such as Sudan and Rwanda; 1901 had migrated from other districts in Uganda such as Arua, Mbale and Kabale Districts and only 1395 households had moved from other sub-counties such as Baale and Galiraya within Mukono district (Uganda, Forest Department 1990).

Population density in Wakisi sub-county has become a critical issue mainly because a big proportion of the sub-county lies within Mabira Forest Reserve. When Wakisi sub-county took on its present administrative boundaries in the early 1980s, a large part of Mabira Forest Reserve was included within the sub-county. However, the area of the forest that was included in the sub-county remained a 1989 of people who had settled in Mabira Forestr Reserve, there was a heightended pressure on forestry resources outside the Forest Reserve. This is particularly so because the local people have no legal access to resources within the Forest Reserve. The part of the sub- county which lies within the Forest Reserve Comprises the following Forest blocks (Compartments): 171, 172, 173, 174, 175, 178, 179, 180, 181, 184, 185, 194, 195, 196 and 197. The total land area covered by those blocks is 7073 Ha (70.73 sq.km). (Uganda, Forest Department, 1990).

While the total area of Wakisi sub-county is estimated at 103.75 sq.km (Uganda, Technical Report 1991).

Prior to 1989 the population in Wakisi sub-county had access to the forestry resources in Mabira Forest Reserve. With the eviction of all people from the Forest Reserve in 1989, population density increased on the available land outside of the Forest Reserve. The eviction process left the Wakisi people with an area of 33.02 sq. km to effectively share and utilize for all their livelihood. Consequently, a population of 28133 on an area of 33.02 sq. km has resulted in a population density of 852 persons per sq. km.

The people who had settled in Mabira Forest Reserve were heavily dependent on the cultivation of crops such as bananas, beans and maize, both for consumption and for sale. The Forest was also a source of firewood, charcoal, timber, building poles, medicine, fruits, pasture and fodder. The products from the Forest Reserve were by no means limited to those who lived in the Forest Reserve but were sold even to urban dwellers like those living in the Capital City of Kampala and the former industrial complex of Jinja. Even the population in Wakisi sub-county that never settled in Mabira depended greatly on the resources from the Forest Reserve.

The eviction by the Govrnment of Uganda of former encroachers people from Mabira Forest Reserve in 1989 led to

an influx of people in the area of Wakisi sub-county that is not under the Forest Reserve. Further, the situation was and still is aggravated by the fact that 10 percent of the sub-county is under tea-estates and sugar-cane plantations owned by settler capitalists and diary farms belonging to local capitalists. Eviction from the Forest Reserve was accompanied with serious patrols by the officers of the Forest Department, the police and the military. Peasants are prohibited from extracting any produce from the Forest and if arrested they are prosecuted and made to pay heavy fines or jailed.

The ban in 1989, by Uganda Government, on the use of resources from the Forest Reserve area has led to pressure on the resources in the part of Wakisi sub-county outside of the Forest Reserve and has consequently accelerated deforestation trends.

The historical emergence of "productive" and "non-productive" zones and labour migrations that has been discussed in chapter three led to the influx of people in Wakisi sub-county and has resulted in a high population density of about 900 persons per sq. km. in some parts, such as Malindi Parish, of Wakisi sub-county. Colonial and Post-Colonial state policies that encouraged the migration of people from other parts of the country and neighbouring countries to form labour reserves greatly distorted the

ecological balance. The migrants came to work on tea-plantation and sugar-came estates. With the departure of the settler capitalists mainly of Asian origin in the early 1970s, the migrant labourers had to look for land to cultivate. With corruption and political instability in late 1970s, Mabira Forest Reserve became an area of heavy encroachment. Alot of people moved in from other parts of the country when the Forest became a lucrative area. The trend of this movement culminated in a population 350 farm families by 1987. People sold off their homes and land and migrated to Wakisi sub-county. The closure of the Forest Reserve to all forms of exploitation has resulted in serious ramifications.

Out of the 200 people interviewed 96 percent expressed firewood scarcity in the sub-county and only 4 percent said they still had enough firewood in the sub-county. The major proximate cause of firewood scarcity is rapid population growth and the interaction between demographic pressure and the structure of agrarian relations precipitated by various socio-economic and political factors.

The way land is used is crucial in understanding demographic pressure and agrarian relations in Wakisi sub-county. The movement of people from the Forest Reserve led to a need to build more houses to accommodate more people. Over a five year period between 1986 and 1992 houses were built at a rate of 20 percent according to information from

the Chairmen of the local Resistance Councils.[1] The Construction of new houses led to increased demand for buildings poles, timber and worod for making bricks. The result has been accelerated deforestation.

Further, the increase in the number of houses has meant a reduction in the amount of land available on which to keep or grow trees, crops and graze livestock. There is, therefore, a reduction in the quantity of fuelwood, timber, building poles, pasture and fodder at the disposal of rural households in Wakisi sub-county. 80 percent of the people interviewed from the six parishes in Wakisi sub-county said they depend on crop residue for most of their fuelwood needs and 20 percent said they depend on firewood, charcoal and sometimes paraffin for most of their household energy needs. The following table 7 shows the size of landholding in relation to the type of fuel used and the major economic activities of the households:

Table 7 shows that in the category of 0- 2 acres of landholding, 132 households were interviewed and an average those households use 40 percent firewood, 10 percent charcoal, 48 percent crop residue and 2 percent other fuels such as paraffin. While in the 5-20 acre landholding category the 16 households interviewed use on average 60 percent firewood, 10 percent charcoal, 25 percent crop residue and 5 percent other fuels such as paraffin. The two households with 50-100 acres

Table 7: **Relationship between size of landholding type of fuel used and economic activities**

Size of landholding (acres)	No. of House-holds	Percentage of fuel used in household (%)				Economic Activities				
		Firew ood	Char-coal	Crop residue	other	WG	TRD	EP	CT	Other
0-5	132	40.0	10.0	48.0	2.0	30 (22.7%)	23 (17.4%)	12 (9.1%)	60 (45.5%)	7 (5.3%)
5-20	16	60.0	10.0	25.0	5.0	-	4 (25.0%)	4 (25.0%)	8 (50%)	-
20-50	-	-	-	-	-	-	-	-	-	-
50-100	2	90.0	10.0	-	-	-	-	2 (100%)	-	-

WG - Wage Labour
TRD - Petty trader/Trader
EP - Employee
CT - Cultivation

Note: The percentages for the amount of each type of fuel used in the household was computed from the average number of days that each type of fuel is used in the household per week. The percentages only show averages of amount of fuel used for each category of size of land-holding.

use 90 percent firewood, 10 percent charcoal and no crop residues as domestic fuel.

On the other hand, within the 0-5 acre landholding category 22.7 percent depend on wage labour for over 50 percent of their household income, 17.4 percent depend on petty trade, 9.1 percent are employees of Government and private companies such as the Mehta sugar factory and Luwala tea-estates Company and depend on salary income for over 50 percent of their household income. In the same landholding category of 0-5 acres, 45.5 percent spend most of their time in subsistence agriculture and 5.3 percent are involved in other activities such as looking after livestock and fishing. While in the 5-20 acre landholding category 25 percent are petty traders, 25 percent are employees and 50 percent spend over 50 percent of their time in subsistence agriculture. The 50-100 acre landholding category households own dairy farms and are traders.

Deforestation in Wakisi sub-county has exerted different impacts on the 0-5 acres, 5-20 acreas and 50-100 acres landloholding categories of households. Wakisi sub-county is a highly differentiated society and factors that influence the use of firewood and/or charcoal or crop residue for basic domestic energy requirements include: the class character of the household, the household size, the size of landholding the period the household has stayed in the sub-county and

ownership of the house where the particular respondent was staying.

Generally, the households with 0-5 acres have a bigger fuelwood crisis than the other categories with larger landholding. The fraction of crop residues forms only 48 percent of their domestic fuelwood requirements. The apparently low percentage can be explained by the presence of wage labourers, petty traders and employees within this category. Some of the petty traders are involved in charcoal trade and so end up using charcoal in their households, while the employees use charcoal and have very little access to crop residues.

The impact of the population in the 0-5 acre landholding category on forestry resource use and subsequent deforestation is rooted in the nature of the agrarian relations among the poor. The land is intensively cultivated for crops and the tendency is to make the land devoid of trees to allow for inter-cropping of food crops. Usually, no land is left to fallow. Further, the category of 0-5 acre landholding is characterised by relative poverty compared to those who own bigger landholding. The peasants in this landholding category have little access to land, trees fodder and pasture for livestock.

Poverty among the peasants in the 0-5 acre landholding category, compared to those with bigger landholings such as 5-20 acres in the form of limited access to land, trees and/or crops, leads to the use or consumption of fuels of lower quality. Firewood is supplemented by crop residues, the proportions varying according to the availability of different fuels which are accessible to a specific household. Firewood is the preferred fuel and the substitution of firewood by interior fuels such as bean stalks, corn cobs reflects the households poor economic status. In addition to substituting down to inferior types of fuel, most households have also reduced the quantity of fuel used. This is reflected both in reductions in the average number of meals consumed per day and amount of fuel used in cooking per meal. Out of the 150 households Interviewed, 62 (or 41.3 percent) households had reduced, their meals to one main meal in per day due to limited access to fuelwood. These trends are particularly noticeable in poorest households where the number of meals per day has been reduced to one main meal in the evening.

The 5-20 acre landholding category presents a different picture. The households with 5-20 acres of landholding depend mainly a firewood from their gardens. In this landholding category small pieces of land, usually up to 0.5 acres, can be and are usually left solely for the "growing" of trees. The trees which include mainly *Markhamia platycalyx* and *Ficus natalensis* were found regenerating naturally. Also these

landholdings can afford to grow some coffee trees which are also a source of firewood. Consequently, the peasants within the category 5-20 acres landholding have more access to fodder, firewood, fruits, building poles and pasture than those in the 0-5 acre-landholding-category. The 5-20 acres landholding category peasants are also in a position to employ wage labour especially from the 0-5 acres landholding category.

The local capitalists in the 50-100 acres land holding obtain about 90 percent of their household energy needs from firewood and the rest (10 percent) is from charcoal. This landholding category is in position to leave part of their land to follow and to the growing of trees. They have more access to labour, firewood, land and pasture than the o-5 acre and 5-50 acre landholding cateogires. However, charcoal they use is not from their landholdings. By partly depeding on charcoal for their fuelwood needs, they have contributed to the deforestation trends.

Thus far it can be deduced that accessibility to fuelwood corresponds to the size of landholding which has been influenced by demographic factors such as migration and population pressure. The problem of inaccessibility to firewood is exacerbated by household size and age composition. The following table 8 shows the average household size and age composition of the different categories of households.

Table 8: Size of landholding, average household size and composition

Size of landholding (acres)	No. of Households	Average Household size (No. of people)	Average Age Composition by percentage (%)		
			0-14 years	15-29 years	Over 29 years
0 - 5	132	7	30.0	38.0	32.0(100)
5 - 20	16	10	49.0	27.0	24.0(100)
50 - 100	2	26	31.0	29.0	40.0(100)

Source: Researcher's Field Notes, 1992

Most of the population within the sample is within three age range of 0-29 years. The households in the 5-20 acres landholding category has got the highest percentage (49 percent of the population within the ages of 0-14 years. This is partly due to to the fact that this group is more polygamous resulting in a high population of the young. Similarly those with 50-100 acre landholding have a high percentage (40 percent of their household with over 29 years. However, the reasonably high percentage (31 percent of those within the ages of 0-14 years is explained by the tendency to many going women in these polygamous homes.

The age composition and household size raises a very fundamental phenomena. Given the fact that there is already a strain on the available forestry resources, the presence of very high percentage of a young population will aggravate the situation. The peasants within the 0-5 acres-landholding-

category are the source of labour for the 5-20 acres and 50-100 acre landholding. In addition to being the source of labour, they are also heavily involved in charcoaling and firewood trade acquired illegally from Government Forest Reserves. With 70 percent of the household members within the age range of 15 years and over, the category of 0-5 acres landholding findings it harder to survive on the household meager resources.

The pressure on forestry resource due to age composition follows a similar trend even at sub-county level. The following table 9 shows population by gender and age group.

Table 9: **Population of Wakisi Sub-county by Gender and Age group, 1990**

	Age Group							
	0-14 years		15-29 years		Over 29 years		Total	
	No.	%	No.	%	No.	%	No.	%
Male	6620	49.8	3487	49.1	4101	52.9	14028	50.6
Female	6666	50.2	3617	50.9	3642	47.1	13925	49.4
Total	13286	100.0	7104	100.0	7746	100.0	28133	100.0

Source: Complied from the 1991 Population and Housing Census, Table 1:2 Uganda, Ministry of Planning and Economic Development

Table 9 shows that the population within 0-14 years category is 49.2 percent of the total population in Wakisi sub-county. This represents a significant part of population

which will exert a very serious demand on forestry resources in near future especially in terms of new housing, new furniture, more firewood for new households and in creased demand for fodder and pasture. Further, the population within the 15-29 age group contributes a significant portion of about 25.3 percent of the total population. In terms of population distribution by 'gender, the population in Wakisi sub-county is rather balanced representing 50.6 percent males and 49.4 percent females. The relationship between gender and deforestation will be discussed further in section 4.3. Suffice to mention here that Wakisi sub-county has got a population structure that is mainly composed of the young below the age of 29 years.

Population pressure and the demand for meeting the basic needs such as food and clothing has led to demand for more agricultural land to increase food production both for household consumption and for cash. As a result poor peasants have moved into marginal lands such as rocky hill-tops (See Fig.1 and 2) and river banks (See Fig. 3 and 4) to grow crops such as maize, beans and cassava. These areas are consequently cleared of nearly all tree cover. The cultivation of the marginal lands has exposed the fragile soils to erosion by especially running water. The extension of cultivation into marginal land increases the risk both of crop failure from drought and soil erosion. Further it heightens conflict between peasants and livestock keepers who have for many years

Fig. 1: Denuded hills of Wakisi Parish with only remaining a few Shrubs, 1992

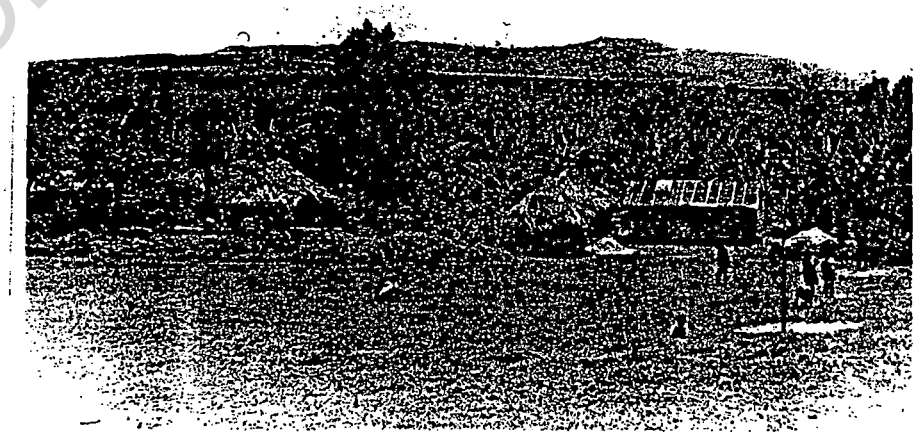

Fig. 2 Denuded hills of Konko Parish, 1992.

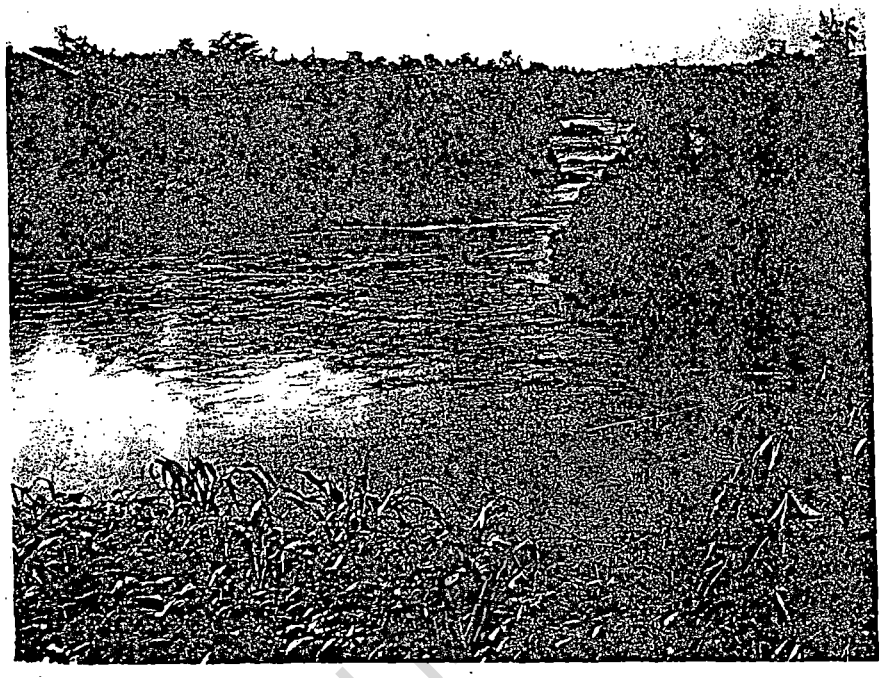

Fig. 3: Cultivation of crops such as maize and beans on the banks of the River Nile, 1992

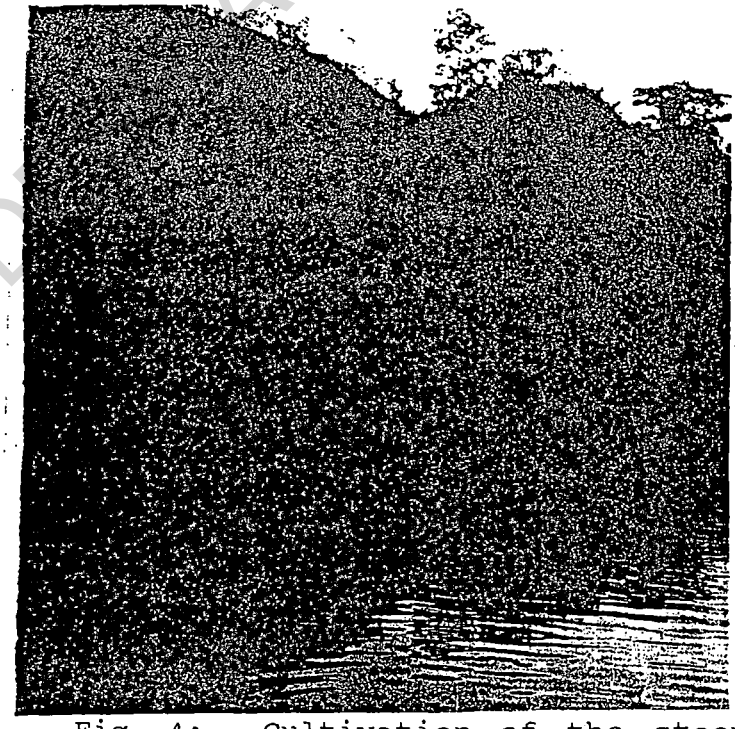

Fig. 4: Cultivation of the steep banks of the River Nile leads to siltation.

traditionally used the more marginal lands for pasture. The high density of human population has reduced or even eliminated rotational bush fallow systems that are important for livestock keepers. The result has been a tendency toward feeding livestock on fodder. A more detailed analysis of livestock production practices will be presented in section 4.3.

The result of complex demographic structures and agrarian relations has been changes in land and tree use especially reflecting socio-economic changes. These changes are associated with the growth of a cash economy and increasing opportunity for the marketing of tree products. The commercialization of tree products has exacerbated deforestation trends and this is further compounded by the differences in level of technology employed at the different levels in the society as discussed in the next section.

4.2.2 Type and Level of Technology

In this section, an appreciation of the role of the level of technology in the production, distribution and consumption of forestry resources is crucial in understanding deforestation trends in Wakisi sub-county (see for example Bagachwa, 1991: 5-7). In this section the author discusses technology from the following aspects: use of locally available forestry resources; economic use of scarce forest resources; ensuring full capacity utilization of forestry

resources; generation of surplus; linkages with other resource sectors; minimizing costs and producing appropriate forest products. The different aspects of the analysis are by no means independent of each other.

The types of tools or implements used in the exploitation of forest resources in Wakisi sub-county is a key factor in coming to grips with the role of the type and level of technology in deforestation. Tools such as the panga, (bush knife), axe, and hoe are extensively used in the exploitation of forestry resources in Wakisi sub-county. Thus way forestry resources are exploited and utilized is crucial in understanding deforestation trends in Wakisi sub-county. The following table 10 shows the ownership of household tools.

Table 10 shows that all the households (100 percent) use the hoe. A high percentage (76 percent) use the panga which is closely followed by the axe (73 percent). 97 percent of the households interviewed use the open hearth for cooking in their homes while only 36 percent use charcoal stoves. Only a meagre 3 percent use paraffin stoves in cooking.

Table 10: **Household Ownership or Use of Various Tools/ Implements/Technologies in Wakisi Sub-county**

Type of Tool/ Implement	No. of Household	Percentage of Total (%)
Hoe	150	100.0
Panga	115	76.7
Axe	110	73.3
Slasher	23	15.3
Hand-Saw	-	-
Power Saw	11	7.3
Wheel/barrow	11	7.3
Radio	30	20.0
Tractor	14	9.3
Car	4	2.7
Bicycle	60	40.0
Open Hearth	147	98.0
Charcoal Store	55	36.7
Paraffin Stove	6	4.0

Source: Researcher's Field Notes, 1992

The extensive use of hoe has precipitated land fragmentation. With a hoe a peasant can grow crops even on landholding of 0-5 acres which would never have been feasible for bigger tools like tractors. On very small landholding peasants can not afford to grow crops such as maize and beans together with trees for fear of reduced production. As a result, these small landholding are left without trees and

thus exacerbating the problem of shortage of fuelwood, building poles, fodder, fruits, timber and soil protection.

Further, the hoe has facilitated the movement of peasant cultivators into fragile lands to grow crops. These fragile lands such as hill-tops of Kalagala, Konko, Nakalanga, Wakisi and Naminya, and river banks are usually cleared of all vegetation and exposed to water and wind erosion. The hills are rocky and eventually turn into useless farmland. As a result peasant cultivators move into new areas to cut down more bush and trees and the trend of deforestation is accelerated. However, one advantage of using the hoe has been that it has allowed peasant cultivators especially those in the category of 5 - 20 acres landholding to practice some agro-forestry.

On the other hand, the use of advanced technology such as tractors for cultivation has even further accelerated deforestation. Over the years, especially from the mid-1960s, the use of tractors has had the effect of clearing large expanses of land to grow crops such as maize, tea and sugar cane. With tractors, agro-forestry systems such as alley - cropping can not thrive. Unfortunately in Wakisi sub-county intermediate technology such as ox-ploughs can not be used due to the nature of the soil structure. The soil structure of Wakisi sub-county has been discussed in chapter one.

Large expanses of land especially in Konko, Malindi, Nakalanga and Naminya have been cleared of nearly all trees cover mainly by using heavy machinery particularly tractors. The sugar - cane plantations (See Fig. 5 and 6) and tea - estates (See Fig. 7 and 8) that have been established in these acres have left the land devoid of trees. These areas cover a total of about 10 percent of the total land area of Wakisi sub-county. Bearing in mind that about 70 percent of Wakisi sub-county is under Governent Forst Reserves, the tea estates and sugar-cane plantations occupy a big area of the sub-county. The tea estates include Mulange, Kyabana, Luwala and Bulumagi. While the sugar - cane plantations belong to the Mehta Group of Companies with the exception of a few small-holder cultivators.

Although some effort is made on some sugar-cane plantations and tea estates to establish woodlots, the effect of the large farms on deforestation out-run the effects of woodlots to provide the necessary tree products especially for the peasants. This is aggravated by the fact that trees grown in those woodlots are out of the reach of the ordinary peasant.

At the level of exploitation of forestry resources, the effect of the use of small tools such as the panga (7 percent), the axe (73.3 percent), and slasher (15.3 percent) may not be obvious. However, it is important to first

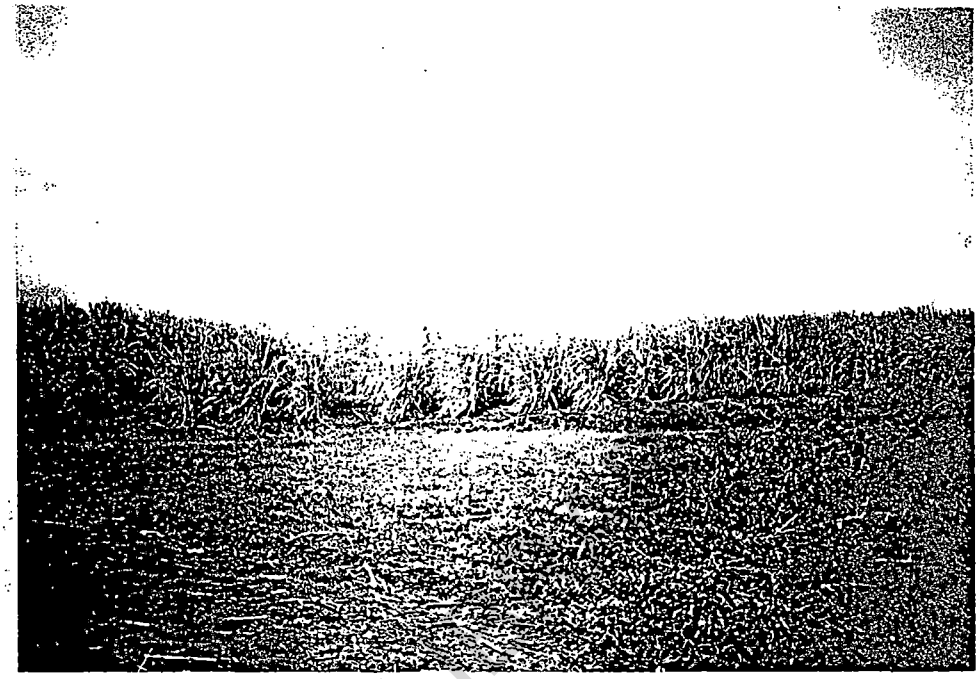

Fig. 5 Mehta sugar-cane plantations, 1992

Fig. 6 Sugar-cane plantation establishment leads to deforestation, Mehta Sugar-cane plantations, 1992.

Fig. 7 Extensive Tea-Estates (Mulange) All trees cleared, 1992

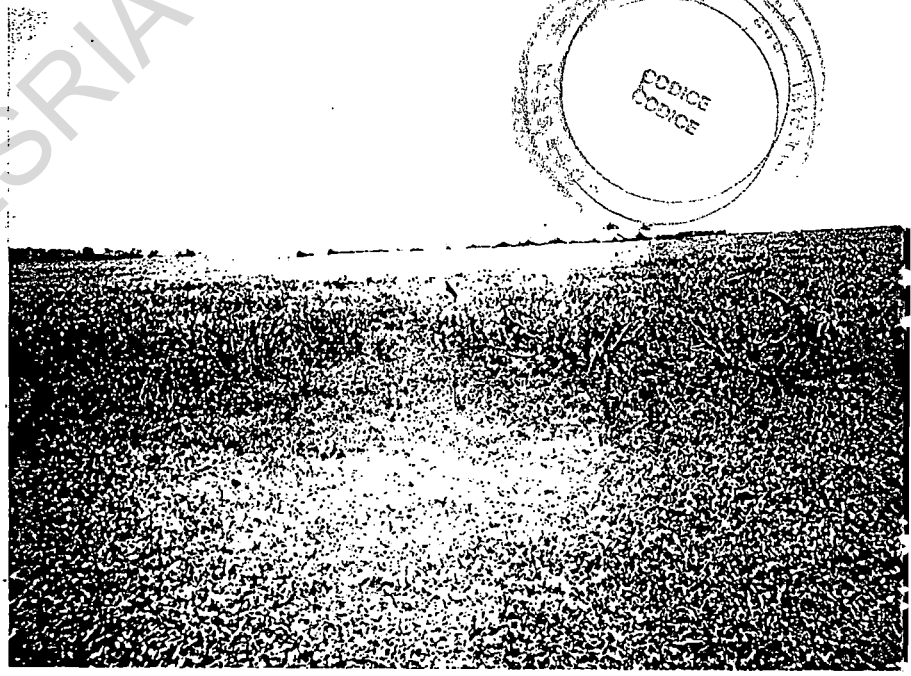

Fig. 8 Labour lines in the background on Tea-Estates, Labourers put pressure on surrounding forestry resources, Mulange Tea-Estate, 1992

understand that the panga and the axe are very important household tools for the majority of peasants in Wakisi sub-county. The axe and panga are used in felling and chopping trees for firewood, charcoal, cutting fodder for livestock, in pollarding and pruning. The chopping of trees using the axe or panga usually destroys the cambium of trees and instead of coppicing the trees eventually die off thus accelerating deforestation. Further, the use of axes or pangas for both felling and chopping up trees leaves high stumps and leads to a lot of waste (See Fig. 9). Handsaws would perform better than pangas and axes in pollarding and pruning. However, none was found in the sample of population interviewed. The reasons interviewees gave for not owning saws included cost and lack of flexibility in use. Unlike the axe for example, a saw can not be easily used in splitting wood for firewood.

The low level of technology is not only responsible for deforestation at the level of exploitation but even at the level of consumption of forest products. The use of the open hearth (Cooking place) and ordinary charcoal stove contributes to deforestation trends (See Fig. 10). 98.0 percent of the people interviewed use the open hearth for almost all their domestic cooking. At the same time 36.7 percent use the charcoal stove.

Generally, in the rural areas of East Africa, Wakisi sub-county included, the rate of conversion of firewood, in t

Fig. 9 Wasteful harvesting of trees by the use of the panga (bush-knife), in Kalagala Parish, Wakisi sub-county, 1992

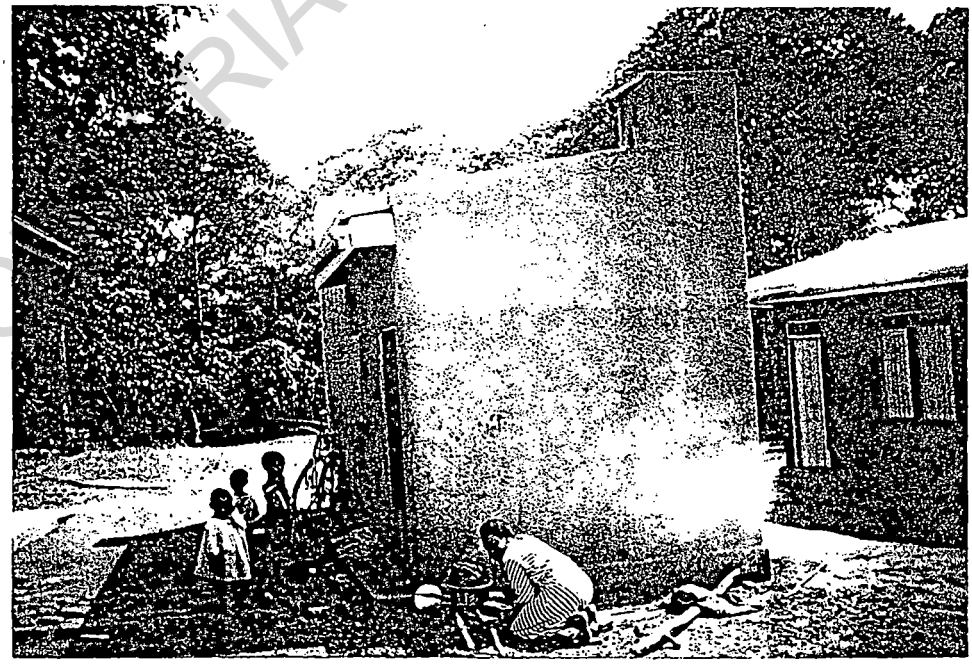

Fig. 10 The use of the open Hearth leads to alot of loss of wood energy. A home of a Forester in Mabira Forest Reserve, 1992

the open hearth Kilns, to covert it into useful energy contributes to deforestation trends (Nkonoki, 1989 :49-52). About 30 percent of wood energy is lost in the open hearth. The loss of wood energy contributes to a very a large extent to the average annual fuelwood consumption of 800 kg. per person. This figure has been obtained as the average total energy consumption converted into dry round wood equivalents (Uganda Government, Forest Department Technical Report, 1991, 58). Poor households use the open hearth because of its high degree of flexibility in use. It can be used for cooking using firewood as well as crop-resides such as bean plant residues, maize stalks and cobs, and twigs. Even the cost of setting up an open hearth is within the reach of every peasant. The hearth is normally made by setting up three stones in an area of an equilateral triangle and the stones can be picked from anywhere.

The use of charcoal stoves is still limited (36.7 percent) of the households interviewed use charcoal stoves. The cost of a charcoal stove is Ushs. 2,000 (US 2.01) and the cost of a bag of charcoal (60kg) is UShs. 7000 (US $7). These costs are out of reach for the majority of the peasants. The effect on charcoal and hence charcoal stoves can be seen in the context of conversion of wood to charcoal. In Wakisi sub-county and surrounding areas the conversion of air dry biomass to charcoal has been fixed at a rate 6.6 of wood to charcoal (Uganda Government, Forest Department Technical

Report, 1991.58). Therefore, the use of charcoal in cooking leads to a double loss of energy; loss at conversion from wood to charcoal and when charcoal is used in charcoal stoves for heating and cooking.

The conversion of wood into charcoal is usually done in the "traditional" Earth Kilns such as the Long "Kinyankole Kiln" and the "Pit Kiln" (See Fig.11 and 12). These kilns have been estimated to have a conversion efficiency of about 20 percent (Uganda Government, Forest Department Technical Report, 1991.58). The wasteful conversion of wood into charcoal especially by the use of the Earth Kiln has greatly accelerated deforestation in Wakisi sub-county.

This is more apparent bearing in mind that improved Kilns have a conversion efficiency of only 20 - 35 percent, depending on the type of tree species used

Transportation and Deforestation

Transportation is a very important factor in the depletion of forestry resources. A National Biomass study carried out by the Forest Department between November, 1989 and December, 1991 determined the effect of each type of wood-fuel transport on the depletion of forestry resources in Jinja area which includes Wakisi sub-county. The frequency of transporters and the various means of transport used in collection and distribution of woodfuel is given in table 11.

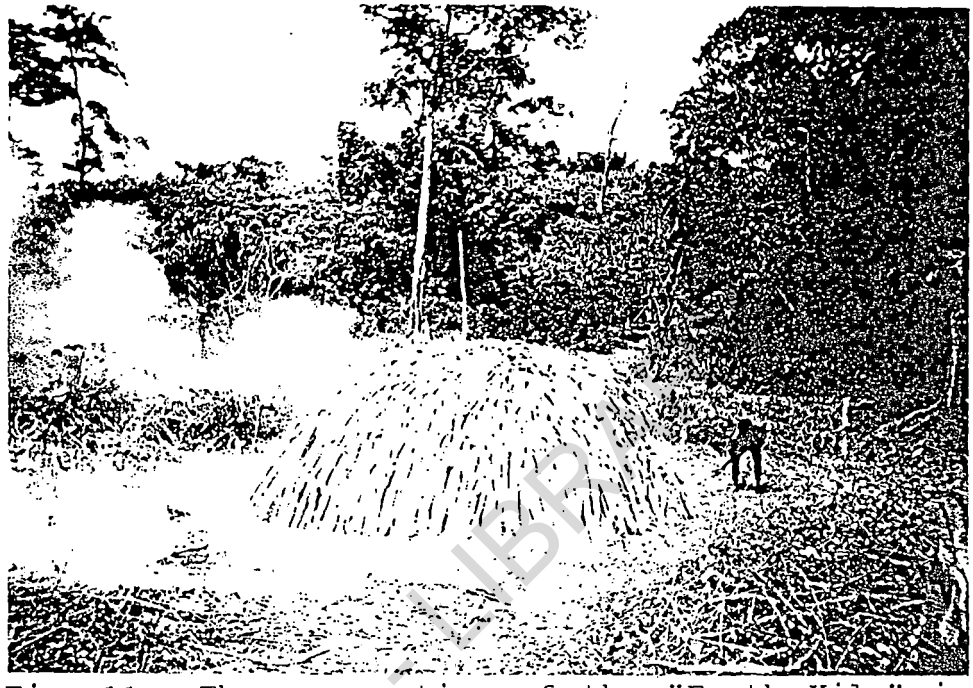

Fig. 11 The preparation of the "Earth Kiln" in Mabira Forest Reserve

Fig. 12 The final stages of the "Long Kinyankole Kiln" in Mabira Forest Reserve, 1992

Table 11: Frequency of woodfuel transporters in jinja

Means of Transport	Frequency of Respondents			
	Charcoal		Firewood	
	No.	%	No.	%
Vehicle (Motoring)	5	2	-	-
Bicycle (Cycling)	159	76	10	83
Foot (Walking)	2	1	2	17
Canoe* (Water way)	43	21	-	-
Total	209	100	12	100

Source: Uganda (Govt. of). Forest Department Technical Report: *National Biomass study phase I* (Nov - 1989 to Dec. 1991), Kampala: 1992 p. 102.

Note *: refers to any transport on water.

A total of 221 transporters were interviewed in the Jinja area. 209 of these were transporters of charcoal and 12 were transporters of firewood. Most of the charcoal (see Fig. 13) and firewood that is used in Wakisi sub-county is transported on bicycles, canoes and by foot. Although among our respondents only 40 per cent own bicycles, it was found that these bicycles are used mainly for petty trade which includes firewood and charcoal transportation Vehicle transport forms a major component in the transportation of woodfuel however, bicycles have proved to be more versatile. Apart from transporting charcoal from charcoaling sites, (see Fig. 14) bicycles also take part in the distribution of charcoal delivered by canoes from landing sites. Bicycles are also used

Fig. 13 Illegally burnt and bagged charcoal in Mabira Forest Reserve, 1992

Fig. 14 Bicycle-charcoal transport, 1992

to get woodfuel from areas that would otherwise be inaccessible to vehicles.

Further, bicycles form a major component of the internal transport network providing a market to door service. Thus, bicycle transporters make more trips (29 trips per month) than any other means of transport in this area. The following table 12 shows the average load of charcoal and firewood per trip and number of trips per month for each transport means to the market place.

Table 12: **Average load of charcoal and firewood per trip by various means of transport (Jinja area)**

Means of Transport	Average Load (tons per Trip)		Average No. of trips per month	
	Charcoal	Firewood	Charcoal	Firewood
Vehicle (Motoring)	0.40	-	6	-
Bicycle (Cycling)	0.05	0.06	29	23
Foot (Waking)	0.05	0.04	15	15
Canoe (Water away)	0.93	-	4	15

Source: Uganda (Govt. of), Forest Department Technical Report *National Biomass study Phase I (Nov. 1989 - Dec. 1991)* Kampala: 1992, p. 103.

Vehicle transport carries a total of 2.4 tons of woodfuel per month, bicycle transport carries 2.83 tons of woodfuel per month, foot transport carries 1.35 tons of woodfuel per month and canoe transport carries 3.72 tons of woodfuel per month. It is however vital to reiterate here that before vehicles and canoes are loaded with woodfuel, bicycle transport is extensively used especially in inaccessible areas. Thus the author contends that bicycle transport has played a major role in the depletion of forestry resources and hence exacerbated deforestation. However, this should not be taken as a campaign against bicycle transport. Indeed bicycle transport is an important component in the socio-economic lives of the Wakisi people. The bicycle is used to transport water, foodstuffs and human beings among many other uses.

The high amount of woodfuel equivalent to 3.72 tons that is transported by canoe is due to dependence on woodfuel from the Islands in Lake Victoria. Due to deforestation on the mainland, charcoal traders have now shifted to the Islands where hitherto very little commercial exploitation of woodfuel was taking place. Of the 200 people interviewed, 80 percent said they get about 50 percent of their fuelwood from the Islands.

Similarly those who use vehicle transport get about 60 percent of the fuelwood they transport from other districts such as Kamuli and Iganga. The effect has been that by going

to far places where fuelwood is still more abundant, vehicle transport has reduced on the rate of depletion of forestry resources in the Jinja area.

Foot transport contributes only 1.35 tons to woodfuel transported per month and is not very fundamental in the commercialisation of fuel. However, as a form of transport it is basically the link for all the other forms of transportation.

On the other hand, the radio has played a role in forestry conservation. 9 percent of the households interviewed claimed to have heard forestry conservation campaigns from Radio Uganda Programmes. Usually the main thrust of Radio forestry Conservation Programmes is tree-planting. However the number of households (20 percent that has access to radio is still small and very few (10 percent) of the households interviewed indicated that they had planted trees as a result of radio programmes. Hence, the radio has not been all that effective in forestry resource conservation. This is more so because issues of fuelwood transportation are never an issue on the radio programmes.

By and large, understanding the role of technology in daily life is crucial in understanding deforestation trends. Both low and high-level technology have adverse effects on forestry resources and it is only when one understands the

role of each type or level of technology that one can come to grips with the unfolding reality of the depletion of forestry resources.

4.2.3 Deforestation, Labour and Social Relations

In this section the author examines how deforestation manifests itself at the household level and how it is influenced by labour and social relations. The relations at the household are situated within a wider context of socio-economic and political factors at National and International levels. The table 13 below shows the different ways through which peasant cultivators in Wakisi sub-county obtain fuelwood.

Table 13: Different ways of obtaining fuelwood

Method of Obtaining Fuelwood	No. of Respondents	Percentage of Total (%)
Searching fuelwood from Gardens	115	76.6
Labour (selling personal labour to get firewood)	35	23.3
Buying	138	92.0
Begging	28	15.3
Stealing	16	10.7
Others	9	6.0

Source: Research's Field Notes, 1992

Note: Percentanges add up to more than 100% because some respondents obtain firewood by more than one modality.

The different approaches of obtaining fuelwood are by no means exclusive of one another. The different percentages show the dominant strategy for the respondents in question. Out of 200 respondents 76.7 percent indicated that they obtain their fuelwood from their gardens. The type of fuel gathered from the gardens includes twigs and crop residue; especially plant residues such as Maize stalks. Buying of fuelwood for household use ranked highest (92 percent). Those who work for others (labour) and are paid in terms of fuelwood represent 23.3 percent of the total. While begging and stealing represent 15.3 percent and 10.7 percent respectively. Others, (6.0 percent) includes the use of other kinds of fuel such as paraffin.

The current changes in land and tree use, especially reflecting a cash economy, have resulted in opportunities for the marketing of tree products in Wakisi sub-county. Of particular significance is fuelwood collected from farm-holdings. Fuelwood is now very scarce in urban areas such the industrial area of Jinja and Njeru. Poor peasants can derive considerable cash income from their roadside sale. A bundle of split firewood of one-metre in length, and about one-third metre high, is currenty sold for UShs. 600 (US $0.5) and a small tin of charcoal (3kg) is currently sold for Ushs 500 (US $ 0.4). With these roadside sales some households earn upto Ushs. 12000 (US $ 10) per month. This has meant pressure on the available trees that are scattered on the farm-holdings

with the result that the trees are becoming less and less. Cash obtained from the roadside sale of firewood is used to meet household needs like buying salt, paraffin, soap, school fees for children, and paying government tax such as graduated tax.

Men dominate the sale of building poles, firewood, charcoal and timber while women collect fuelwood for use in the household. Many men have moved into the fuelwood trade as cash-earning opportunities have increased. The effect of this phenomenon has been heavy burden on the women as they have to spend long hours in the collection of fuel, especially crop resides, for household use. The result has been a control of the men over the trees on the farm-holdings. Women can only use firewood at the discretion of the man.

The farm-holdings especially those in the 5-20 acre category, obtain most of their fuel requirements from trees such as *Artocarpus heterophyllus* and coffee branches. These trees are usually grown on their farmholdings or around the homesteads. In the past, especially in the early 1980s the trees were felled at the end of their productive lives. With the growth of cash-economy trees are not cut even before reaching their productive lives and this has accelerated deforestation in Wakisi sub-county. The trees can be felled by hired labourers, cut into small logs and then left to dry. For the households within the 5-20 acre-landholding-category the

fuelwood from fruit trees provides a fuel of relatively high density than crop residues predominantly used by the poorer peasants. The firewood from fruit trees provides an intense heat which means that cooking can be completed quickly, yet, it burns slowly so that the fire can be left unattended for fairly long periods.

Poverty, in the form of limited access to land and to the trees or crops which can be grown on it, leads to the consumption of fuels of lower quality. The use of lower quality fuels in turn serves to reproduce the poverty of the households in question by diverting women's labour from other productive activities. For poor house holds one way of obtaining fuelwood has been through stealing from neighbours and the Government Forest Reserves such as Mabira.

Those who steal fuelwood from the Government Forest Reserves leave near the Reserves such as in the parishes of Kalagala, Konko, Wakisi and Nakalanga. Most destructive to the forest are those who burn charcoal in the Forest Reserve. The tendency is to clear all trees in the vicinity where the charcoaling process is to take place. Charcoal burners contribute 80 percent of those who steal firewood from the Forest Reserves. The illegal exploitation of forest resources has contributed to deforestation. The fraction contributed by big capitalists to deforestation is mostly in the form of firewood and timber. Firewood is used particularly in tea

processing at Luwala tea factory. The following Table 14 shows the amount of firewood extracted from Mabira Forest Reserve by Luwala Tea Estates Company Ltd.

Table 14: **Firewood extracted from block 174 and 175 (Mabira Forest Reserve) by Luwala Tea Estates, Mukono District**

Year of Operation	Amount of Firewood extracted (m^3)
1984	2260
1985	3150
1986	4541
1987	5600
1988	6890
1989	7900
1990	8100
1991	10980

Source: Compiled from Uganda Government, Forest Department Returns for Luwala Tea Estates Company Ltd., Mukono District.

Luwala tea-estates have been cutting firewood from mabira Forest Reserve without planting any trees to replace those being cut. A letter from the Forest Department dated June 28, 1991 to Luwala Tea Estates Co. warned:

> "You may recall that when you were stopped from cutting from Compartment 175 you were supposed to immediately begin planting compartment 174. This has not been the case. You have instead moved

> into compartment 174 and cut all the trees that were remaining standing" (Uganda, Forest Department Communication, Ref. 3/44).

The effect of big capital mainly foreign owned such as Luwala tea estates Company Ltd. on forestry resource conservation can be great. In the case of Luwala Tea Estates Co., the Company has stopped cutting firewood from Mabira Forest Reserve due to a Government ban on all forms of forestry exploitation in Mabira Forest Reserve. But what that means is that Luwala Tea Estates Co. has now to look for firewood from private growers and those include peasants, who have trees on their farm holdings.

The peasants are attracted by the price of firewood which currently Ushs 60,000 (US 50) for about 64m^3 of firewood. The peasants look for any avaible trees to cut and sell firewood to earn some cash to meet basic domestic needs such as clothing salt, soap and health costs. The effect of this commercialisation of firewood has been reduced availability of firewood in Wakisi sub-county and thus, rising deforestation trends.

Timber exploitation presents even a higher amount of wood extracted from Forest Reserves. However, just like fuelwood, estimates of how much wood is cut for timber per year are difficult to assess. The following table 15 shows the amount of roundwood cut from Mabira Forest Reserve over a five year period.

Table 15: **Roundwood (timber) extracted from mabira by Kiira Sawmill and Plywood Factory**

Year	Amount of wood (m^3)
1984	2240
1985	2288
1986	3790
1987	4180
1988	5910

Source: Complied from Uganda Government Forest Department, Timber Returns for Kiira Sawmill and Plywood Factory, Mukono District.

The 1989 to 1992 represents the time when Mabira Forest Reserve was closed to all legal exploitation of forestry products. According to field interviews that period represents an estimated exploitation of 4000 m3 of timber from the Forest Reserve.

The exploitation of forestry resources from Forest Reserves is basically controlled by the Forest Department. When the Forest Department legally closed the Forest Reserve from all forms of exploitation the result was increased pressure on the wood available on peasants' farm holdings and continued illegal exploitation from the Forest Reserves. Thus deforestation results from cumulative land-use decisions through time and these decisions ought to be considered as part of a wider socio-economic and political analysis. The chronology of the evolution of deforestation has been

discussed in chapters two and three. Suffice it to mention here that social and physical landscape in which the peasants find themselves has long been impacted on by colonial socio-economic and political factors, first in the form of colonialism and later as part of a long-term development of world capitalism.

In the section the author analyses the role of the state in the Management of forestry resources.

4.3 CULTURAL AND ECONOMIC DIMENSIONS AND STATE MANAGEMENT OF FORESTRY RESOURCES

In this section the author analyses how livestock production practices, agriculture, right to onwership (of capital, land and trees), culture, gender, education and health are affected by State Forestry Conservation efforts and how they interact with deforestation.

4.3.1 Livestock Production Practices

Livestock keeping forms a significant part of the livelihood of peasants in Wakisi sub-county. The following table 16 shows the amount of livestock in Wakisi sub-county over an eight year period (1985-1992).

Table 16: **Livestock production in Wakisi sub-county (1985-192)**

Year	Type of Livestock			
	Cattle	Goats	Sheep	Pigs
1985	1300	3500	460	4300
1986	1440	4000	580	5020
1987	1580	5000	630	6000
1988	1600	4500	776	6000
1989	1560	4700	820	5000
1990	1560	5000	760	5300
1991	1620	5200	800	4500
1992	1400	3900	560	4000

Source: Compiled from Annual Production Reports, Uganda, Department of Veterinary Service, Mukono District.

Livestock are a source of cash, meat, milk, and dung cattle dung is used as manure and in some cases in its dry form a fuel. Livestock production in Wakisi sub-county is an integral part of subsistence agriculture. Due to the nature of demographic influence and agrarian relations, livestock production is a major problem to the majority of peasants Wakisi sub-county. With decreasing pasture and forestry resources in general it is quite difficult to keep very big numbers of livestock in Wakisi sub-county.

Although the Uganda Forestry Policy (1988) tries to address the issue of helping farmers to practice agro-

forestry, (see Appendix IX) the emphasis is on trees and livestock is relegated to the Department of veterinary services or even sometimes to the Department of Agriculture. The agri-silvi-pastoral systems are more often than not mere verbal slogans by forestry extension personnel simply to fit in the tune of the day but not as a professional obligation. Forestry practice still remains inclined to the protection and exploitation of Government Forest Reserves and not as an extensive programme for helping peasants to adopt a culture of tree management and environmental conservation. In this context therefore, livestock is looked at by a forester as a menace that destroys trees and ought to be fought by all means. Thus the Forest Department Communication asserted the following:

> "Grazing in Mabira Forest Reserve has reached alarming proportions. This is especially noted in Wakisi sub-county. The parts most affected are: Kirugu, Wakisi, Wabiyinja, Wabusanke and Naluvule. Grazing is another form of encroaching on forests which destroys trees especially the undergrowth and therefore cannot be allowed in a natural forest like Mabira (Uganda Government, Forest Department, Ref MAL/93,: 1).

The above communication was addressed to a local chief. Our argument is further concretized by a similar communication from the Forestry Department to the same local chief on the same subject of illegally grazing in Mabira Forest Reserve:

> "As you may already know, the above subject is not new in your sub-county but

> has persistently grown from bad to worse. It is absolutely illegal for anyone to take livestock which include cows, goats, sheep and pigs into a Forest Reserve and worst of all to graze... By copy of this letter the police is asked to take note and arrest anyone found grazing in the Forest Reserve as per Chapter 246 Section 14 sub-section 2 of the Forest Act" (Uganda Government Forest Department, Ref. KY4/1/1991 : 1-2).

Although the method of arrest and punishment had been used before, the communication indicates that the problem of illegal grazing has grown from bad to worse. The same communication indicates that the Forest Department was working tirelessly to replant the formerly encroached areas in Mabira. The report further claims that the efforts of the Forest Department were being curtailed by illegal grazing through the act of livestock trampling on young seedlings and hardening the soil making the planting of trees difficult (See Fig.15). The result was the order issued by the Forest Officer to the local chief to infrom his subjects about the great harm caused by livestock to the forest and to order them to desist from the act of grazing livestock in the Forest Reserve. However, without addressing the real root cause which is discussed later in this section, of the problem of illegal grazing, the problem has persisted as the following report shows:

> "Illegal grazing of cows has been noticed in most areas within the charge. Efforts have been made to contact the local chief and Resistance Councils (RCs) of the concerned areas but it is unfortunate that some of these animals belong to them (the local chiefs). So little work has

> been done on this issue" (Uganda Government Forest Department, Nazigo Range Monthly Report Sept. 1992 : 1).

The implementation of the Forest Act has not stopped the problem of illegal grazing as can been seen from the above statement. Grazing in the Forest Reserve has continued (see Fig. 16) not because of ignorance on the part of grazers but due to socio-economic factors that the Forest Department does not seem to have addressed. Cows, goats, sheep and pigs still graze in the Forest. The animals trample on young seedlings and browse on the young trees. Grazing is an important factor in deforestation.

The effect of grazing and browsing by livestock on deforestation should not been noted only in Government protected Forest Reserves but also on lands belonging to peasants. The following table 17 shows the size of livestock and number of households from the people interviewed.

Fig. 15 Grazing of cows in Mabira Forest Reserve, 1992

Fig. 16 Grazing of cows, goats and sheep in Mabira Forest Reserve, 1992

Table 17: Size of Livestock herd and number of Households in Wakisi sub-county, 1992

Type of Live-stock	Total No. of Live-stock	Size of Livestock herd and Number of Households										Total No. of Households	
		0 - 5		5 - 10		10 - 15		15 - 20		Over 20			
		No.	%	No.	%	No.	%	No.	%	No.	%		
Cattle	570	54	84.4	7	10.9	3	4.7	-	-	-	-	64	100%
Goats	546	7	43.8	2	12.5	-		5	31.2	2	12.5	16	100%
Sheep	90	5	71.4	2	28.6	-		-		-		7	100%
Pigs	132	21	84.0	-		4	16.0	-		-		25	100%
None	-	-		-		-		-		-		38	100%

Source: Researcher's Field Notes, 1992

The households interviewed had a total of 570 cows, 546 goats, 90 sheep and 132 pigs. When the number of livestock is analysed in terms of the number of persons per square kilometer in Wakisi sub-county, livestock production presents an issue for concern. The average herd size of livestock in Wakisi sub-county is generally small falling within the range of 0-5. 84.4 percent for cows, 43.8 percent for goats, 71.4 percent for sheep and 84.0 percent for pigs. Wakisi The effect of livestock on deforestation is partly a factor of the size of land-holdings. Table 18 below shows the size of landholding and size of herd of livestock.

Table 18: **Households, Size of Landholding and Livestock**

Size of Holding	Households	No. of Households with			
		Cows	Goats	Sheep	Pigs
0 - 5	132	20	100	20	50
5 - 20	16	10	14	20	9
20 - 50	-	-	-	-	-
50 - 100	2	2	2	2	2
Total	150	32	116	42	61

Source: Researcher's Field Notes, 1992

All those who have landholdings which are more than 5 acres own some livestock. All the respondents intervieweed reported that they had claimed to have reduced the size of the number of their livestock by more than 50 percent over a

five-year period. The reduction in herd size has been prompted by restrictions on grazing in Mabira Forest Reserve and the formerly abandoned tea-estates and sugar-cane plantations. Other reasons for reduction in herd-size include selling to get cash for medical treatment, to pay school fees, to meet domestic needs such as salt and fuelwood, to pay for witchcraft services, lack of veterinary drugs and selling to get cash to pay taxes.

The majority of the population have landholdings of less than 5 acres. However, most of them own some livestock. The largest number of livestock are found with the rich peasants who own more than 5 acres of land. These rich peasants can employ labourers to drive their animals over distances of more than 10 kilometers in search of pasture. Many of these animals are grazed along the roadside, in the Forest Reserves, along the tea-estates and sugar-cane plantations, and along the river banks.

At the household level, fodder is an important factor in livestock production and contributes up to 60 percent of the animal feeds in over 40 percent of the households. Branches of trees such as *Ficus natalensis*, banana leaves and stems are cut and fed to the animals. Because trees have to be cut regularly for fodder, usually the trees fail to coppice and die-back and this causes deforestation.

Further, goats, cows and sheep browse on young trees in the peasant farms and reduce the chances of survival of young seedlings that would otherwise regenerate naturally. 60 percent of those interviewed indicated that livestock belonging to rich peasants had broken into their farms and destroyed their food crops and trees. Moreover the general complaint from the poor peasants is that the milk from the cattle of the rich peasants is sold in towns such as Jinja and not in the villages.

Thus far, livestock production practices have been directly influenced by the interaction between rich peasants, poor peasants, the local chiefs and the State policies. It is important to understand how the above factors operate in order to address the problem of deforestation in the context of livestock production practices in Wakisi sub-county. The poor peasants have found themselves in a vicious cycle of poverty and social distress. The State policies as practiced by the Forest Department have so far not addressed the issue of social differentiation in Wakisi sub-county and the need to provide alternatives for the poor peasants who struggle to survive.

4.3.2 Agricultural Practices and Deforestation

According to interviews carried out with the elderly people in Wakisi sub-county, it was concluded that in per-colonial societies in Wakisi the peasants integrated food

crops, livestock and trees. This was largely within the system of bush and fallow management of land. Reportedly, a forest was usually cleared, cultivated and crops grown in it. After a period of say five years, the place was left to fallow and the cultivator moved to a new area while the old piece of land regenerated into forest and acquired soil nutrients. The cultivated areas were grown with perennials such as bananas and it was possible to grow the perennials with trees such as *Ficus natalensis* and *Markhamia platycalyx* while at the same time some livestock was kept on the same piece of land.

Thus, the practice of "agro-silvi-pastoralism" is not new in itself in Wakisi. But today there is a shift to seasonal crops such as maize, soy-beans, cassava and beans. The factors that are responsible for this shift are population pressure, agrarian relations and the interaction with socio-economic factors. The land has to support a large number of people and food crops such as maize and beans have to be produced on an intensive scale to feed the population. 75 percent of the people interviewed are "squatters" and thus do not have permanent ownership of land. Consequently, they end-up cultivating only seasonal crops that such as maize and beans. Further, the growth of a cash economy demands that people grow crops that grow in a short time of usually only 3 months to raise cash for households needs. From our knowledge of the soils and trees currently grown in Wakisi sub-county we

suggest the introduction of more tree species through agro-forestry research (see Appendix IV).

The seasonal crops need a lot of sunlight for intensive growth. So the peasants in general avoid cultivating them in the same plots with trees. The cultivation of seasonal crops on an intensive scale has resulted in deforestation. Out of the 150 households interviewed 53 percent had small banana plantations and 50 percent maintained small coffee shambas of on average 0.25 acres. Thus, there is a general shift away from the perennial crops to seasonal crops.

The Forestry Policy (1988) mentions the establishment of extension and research services aimed at helping farmers, organisations and individuals to grow and protect their own trees for timber, fuel and poles; as well as to encourage "modern" agro-forestry practices (see Appendix IX). But even the recent invention of the term "agro-forestry" may not provide a theatre for a tree-food strategy apart from encouraging foresters to think about the relationship between their trees and the agriculturalists' crops.

The society in Wakisi sub-county has been drawn into commoditisation with the result that peasants have to depend on the market for almost all household needs such as fuelwood, salt, and medical services. The growing trend towards commoditisation of necessity demands that peasants have to get

cash in one way or the other. For Wakisi sub-county since the main economic activity for the people is cultivation (70 percent), the peasants have resorted to fast growing crops such as beans and maize to earn cash. The land is therefore under constant use. Even the trees that would regenerate naturally are not given the chance to do so. The poor peasants who cannot meet their cash needs from their farms have to sell their labour to rich peasants, tea-estate companies and sugar-cane factory for cash.

The Structural Adjustment Programmes (SAPs) of the International Monetary Fund (IMF) and World Bank (WB) demand that peasants produce enough crops especially grains for export. Peasants are now and again called upon to meet the demands of SAPs. One of the major demands of SAPs is to encourage the production and export of tradeables. Hence in Wakisi sub-county there is a shift from non-tradeables to the tredeable goods sector especially the primary commodities. The removal of inputs subsidy has made it diffecult for the poor peasants to buy essential inputs such as hoes and fertilizers. The peasants have been left to the "magical" power of the forces of supply and demand. The immediate effect has been the further shift from the "traditional" cash crop production to the growing of food crops which are now used as cash crops. The peasants then find themselves in a situation where they need to boy forest products such as fuelwood, which they would otherwise grow on their farms. As a result the peasant is

further forced to grow more crops to get more cash leading to even further deforestation.

Because of deforestation and denudation of the land, sources of water have been depleted. The springs that used to keep water even during the dry season have been cleared of forest cover. The natural springs have no water during the dry season because of the past evaporation which takes place. The land has no permanent cover and the water table is lowered. The bush and fallow system of cultivation is no longer feasible. Respondents also reported that rainy seasons are no longer reliable and rains are very erratic.

Nowadays due to the cash nexus, population pressure, commoditisation, proletarianisation and marginalisation, the poor peasants cannot easily copy up with deforestation trends.

4.3.3 Ownership Rights, Culture, and Education

Our study showed that 60 percent of our respondents are squatters on the land they occupy and 20 percent own land on public land and do not hold any land title. The first category comprises those who entered into some agreement with the owners of 'Mailo-land' and therefore hold some ownership which neverthess is not permanent. The second category is of those who own land through customary inheritance. Apart form the two major kinds of land ownership found among our respondents there is yet a third category of those who rent a piece of

land just for one season to grow crops such as maize and beans. Others are just labourers who take "take care of land" for their absentee land-lord-cum-employers. The last two categories comprise 20 percent of our respondents.

All the above categories of landless cultivators in Wakisi sub-county have insecurity of land tenure. As a result of insecurity of land tenure, peasants in Wakisi sub-county do not undertake long term projects such as conserving and planting trees on pieces of land they occupy. This lack or neglect of sense of improvement of land is also reinforced by the fact that 40 percent of the peasants interviewed tend to shift from one piece of land to another.

The poor peasants are often forced to move to new places as a result of rich peasants and/or landlords increasing rent, coming to disagreement over what type of crops to grow or as ownership of land changes.

There is a difficulty, if not impossibility of successfully implementing forestry conservation schemes or arresting deforestation trends within agrarian structures that are characterised by sharp socio-economic and political inequalities between the state, big capitalists, rich peasants and poor cultivators.

All timber trees such as *Chlorophora excelsa* and *Maesopsis eminii* belong to the landlord irrespective of who planted them. Also according to the Forests Act Revised Edition, 1964 all such timber trees growing on Public Land belong to the State. The double insecurity of tenure of trees has resulted into a lot of deforestation. Because peasant cultivators lack ownership rights they usually cut the trees "illegaly" for firewood and charcoal and no planting takes place.

As far as insecurity of land tenure is concerned, women are affected along with the men. However, insecurity of land tenure and products of land such as trees is compounded for women due to cultural "stereotypes". Out of 200 people interviewed, 180 (or 90 percent) said it is men own property such as land, trees and houses if they are married. In the case of land, the woman is supposed to depend entirely on the husband except in women headed households. In our study 90 percent of the women respondents said that land and trees belong to their husbands or were borrowed from husband's parents or from other people. The lack of ownership of trees and land for women has proven a big hinderance to forestry conservation efforts. An analysis of women's participation in forestry conservation will be presented in section 4.4.

The problem of property ownership between the different gender, and among peasants of different social categories is

compounded by the nature of Forest extension programmes. In 1992 in Mukono District, 97 percent of the Forestry extension personnel were men and in Wakisi sub-county in particular, there was no wamen Forestry extension officer. The absence of Women Forestry extension officers is exacerbated by the notion that men do not as a matter of custom approach another man's wife without the consent of the husband. In fact the author had to seek permission from husbands to talk their wives. The gender inequality in forestry extension services has had the tendency of relegating women to the periphery.

According to this study, of the women who had been visited by Forestry extension personnel, 85 percent had met such women at the Women Project Sites in contrast to men whereby 80 percent of them were and had been visited in their homes. From the above evidence it is reasonable to argue that had such women not set up the Women Tree-planting Project they would almost never have an opportunity to talk to Forestry extension personnel.

Deforestation has also been facilitated by culture which, among other things, requires that the father sub-divides his land among his children. As a result the land becomes increasingly sub-divided and fallow periods are gradually reduced and finally eliminated. Bush is no longer allowed to grow and regeneration of trees becomes a story of the past. And in line with the cultural problem is the low level of

education. The following table 19 shows the level of education and the number of respondents.

Table 19: **Level of education and Number of respondents**

Level of Education	Number of Respondents Percentage male or female in this category		Total	
	No	%	No.	Percent of Total %
No Formal Education	M 20	28.2		
	F 51	71.8	71	35.5
Primary 1-4	M 5	23.8		
	F 16	76.2	21	10.5
Primary 4-7	M 34	52.3		
	F 31	47.7	65	32.5
Secondary 1-4	M 27	71.1		
	F 11	28.9	38	19.0
Secondary 4-6	M 4	80.0		
	F 1	20.0	5	2.5
Total	200		200	100.0

Legend: F - Female
M - Male

Source: Researcher's Field Notes, 1992

From table 19 it can be seen that 46 percent of the respondents had education up to primary four. This category of

respondents could not read and write. And among those who had no formal education, the women ranked highest (71.8 percent). Within the category of those with education up to primary 4 still the women formed the biggest percentage (76.2 percent).

The level of education has affected the depletion of forestry resources at two levels; at the level of forestry extension programmes and the household level. At the level of forestry extension, forestry personnel and other extension officers are known to approach peasants who can read and write. While at the household level, it is those with formal education who easily get access to information and materials necessary for tree planting. The following table 20 shows the level of education and participation in tree planting.

Table 20: **Level of Education and number of Respondents who had planted Trees and percentage of total within different Levels of Education**

Level Education	Number of Respondents				Total of Respondents
	Planted Trees		Not Planted Trees		
	No.	% of total	No.	% of Total	
No Formal Educ.	16	22.5	55	77.5	71
Primary 1-4	10	47.6	11	52.4	21
Primary 4-7	28	43.1	37	56.9	65
Secondary 1-4	30	78.9	8	21.1	38
Secondary 4-6	5	100.0	-	-	5

Source: Researcher's Field Notes, 1992

77.5 percent of the respondents without formal education had not planted trees in the past five years and the majority (71.8 percent) in this category are women. However in the category of secondary 1-4 and secondary 4-6, 79 percent and 100.0 percent respectively of the respondents said that they had planted trees the past five years. Thus, the trend is for those with more formal education to plant trees. The evidence from table 20 shows that there is a bias for extension officers to concentrate on peasants with formal education neglecting the majority of peasants who fall within the category of no formal education. This tendency of only addressing the "educated" reproduces inequality at the local level in Wakisi sub-county. The poor use their resources such as forestry resources without replenishment and this has greatly contributed to deforestation.

The problem of ignoring or neglecting peasants with no formal education in extension services is compounded by the fact that women are the majority in this category. Women undertake the majority of tasks in agricultural production. Women also perform tasks associated with biological and social reproduction such as cooking, caring for the young, the sick and old, and do such other work to sustain dominant gender relations. Further, women face unequal allocation of and control of resources. The issues of differential treatment or opportunities with respect to ownership rights, culture, gender, education and health need to be addressed and where

possible restructured to provide for equality. Such reforms would enhance the overall strategy of afforestation and reforestation. The question of property ownership particularly of land and the products of land such as trees is very crucial in determining control and decision making.

4.4 THE COMMUNITY AND STATE INTERACTION VIS-A VIS FORESTRY RESOURCE MANAGEMENT

This section presents an analysis of the interaction between the legal framework and related instruments on one hand and the local Communities in Wakisi sub-county on the other hand. The local communities in this case are the intended participants in forestry resource management and accordingly the target beneficiaries of such forest development-cum- management programmes/strategies.

Tree production can be promoted under individual, government or community management. The production can also be promoted on private government or community (belonging jointly to a village or group) land, for commercial or non-commercial use. "Farm forestry" usually implies individuals growing trees (to sell or for own use) on private land. Social forestry on the other hand implies the planting of trees for meeting the needs (especially of fuel and fodder) of the rural people usually through the use of government or community land under government or community management respectively. Such tree

planting when undertaken by the community (typically on village land) is also often termed community forestry.

In the past five years (1987 to 1992), numerous schemes under the three systems of forestry management described above have been tried in Uganda with the financil support of International Aid Agencies such as Food and Agricultural Organisation (FAO), United Nations Development Programme (UNDP), Danish International Development Agency (DANIDA) and carry American Relief Everywhere (ARE). In Wakisi sub-county DANIDA and CARE initiated some work on Farm forestry. The performance of these projects in Wakisi sub-county will be discussed in details in section 4.51.

However, despite the fact that DANIDA, CARE and JEEP (Joint Energy and Environment Project, a local NGO) had initiated some forestry conservation work (particularly tree planting) in Wakisi sub-county, there is almost no physical evidence of their operations among the people. Table 21 shows the local peasant participation in community programmes.

Table 21: **Local Community participation in Community Projects.**

Programme		Participated No.	%	Never Participated No	%
Community Forestry	M*	10	11.1	80	88.9
	F*	70	63.6	40	36.4
Other Community Programmes e.g. Spring Protection	M	82	91.1	8	8.9
	F	30	27.3	80	72.7

*Note: M - Male
F - Female

Source: Researcher's Field Notes, 1992

11.1 percent of the male respondents had been involved in some kind of Community Forestry Project and for the female the percentage was 63.6 percent. The higher percentage for women participation is partly contributed by the presence of Women Tree Planting Projects such as Malindi and Naminya Tree Planting Projects. 91.1 percent of the male respondents had been involved in other community programmes such as spring water source protection and the corresponding percentage for females was 27.3 percent. Community Development Programmes such as spring water source protection, digging roads, etc. are usually done under local authority bye-laws.

Since fuelwood scarcity is a major or serious problem in Wakisi sub-county it is reasonable expect a high participation by the peasantsin forestry programmes. However, while the

while the Forestry officials and those involved in forestry conservation programmes may accept that community forestry or farm forestry is for the people they are still far from demostrating that it is and should be by the people. They seek to decide what is good for the community rather than letting the community decide what is good for themselves and help them in doing it.

The false assumption by those who implement State policies in Community and Farm Forestry schemes is that the community will actively participate in tree planting. Yet on the other hand very little effort has been made by the scheme initiators to actively involve the people in scheme identification, design and subsequent implementation. On the other hand, the unequal pattern of landownership and control, and the power structure operating at the household and in Wakisi sub-county as a whole, circumvent voluntary participation by the underprivileged. In the absence of structural transformation such as redistributive land reform, community involvement in forestry programmes is likely to be extremely difficult in most cases, and in some perhaps not feasible. Community involvement in forestry programmes is the crux in deforestation for the Forest Department. The peasants are seen by those who implement State Policies to destroy their environment by cutting trees out of ignorance and not planting any. With low level lack of community participation in forestry conservation, deforestation will remain a problem

at least in the foreseeable future and deforestation will become worse.

Evidence from our study indicates that peasants are not necessary opposed to community programmes per se. 91.1 percent of the male respondents had been involved in community development programmes such as spring water sources cum-improvement (See Fig. 17 and 18). Evidence from out study indicates that peasants are not necessarily opposed to Community Project perse 91.1 percent of the male respondents had been involved in Community Projects such as spring water source protection-cum-improvement.

In Wakisi sub-county adults particularly those above the age of 18 years are required by local rulling to participate in community programmes. However, women participation in programmes such as water source protection was found to be low (27.3 percent of the females interviewed) compared to (91.1 percent of males who were interviewed).

Although govrnment authorities and even men are increasingly becoming aware of the women's problems women's role in drawing water, collecting fuelwood, agriculture and domestic activities leave them very little time for resting or even for participating in social and political work (See Fig.19 and 20). They are still relegated to the kitchen and playing the dominant role in meeting the consumption and

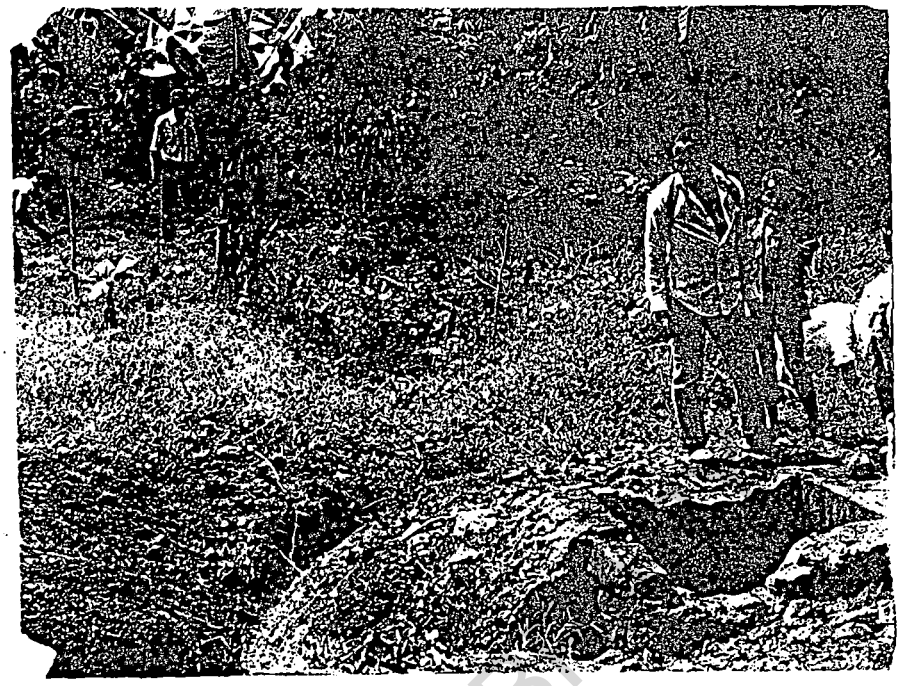

Fig. 17 Local Chiefs (Malindi Parish) inspecting a spring water source, 1992

Fig.18 Peasants participating in community spring water source protection, Malindi, 1992

Fig. 19 Woman carrying firewood from Mabira Forest Reserve, 1992

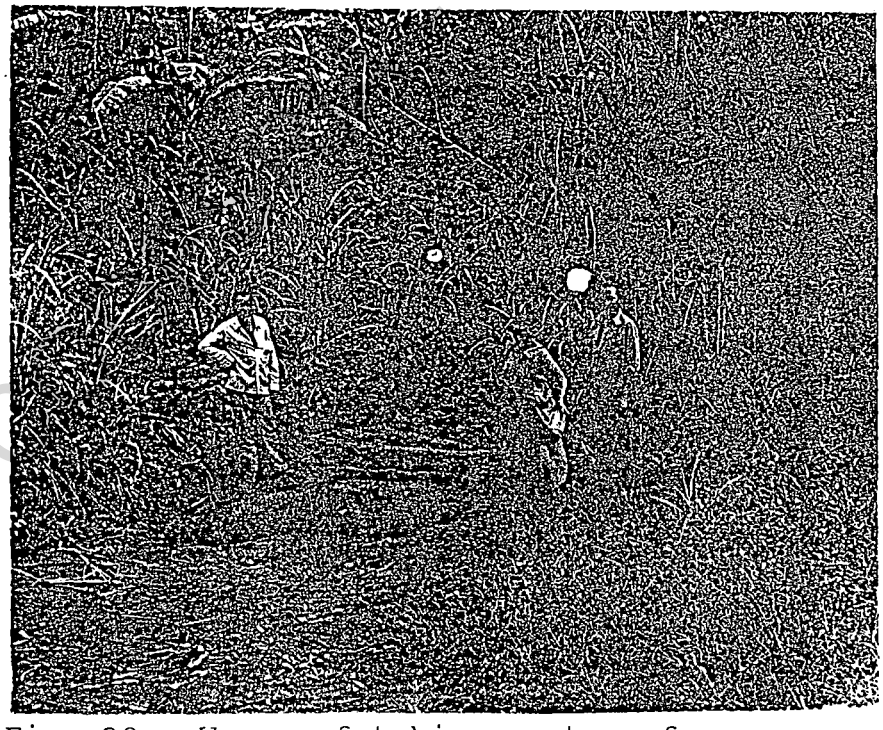

Fig. 20 Women fetching water from a spring, Malindi, 1992

protection demands of the family. The women who have managed to join the women tree-planting projects were either widows, women house-heads, young girls or wives of "educated" men. Sometimes the peripherisation of women is attributed to culture. The result has been the consequence that deforestation is not a big problem in Wakisi sub-country.

Although women are involved in tree-planing projects, their role in establishing woodlots has been minimal. Since most peasant women have very little economic control and ownership of property such as land, there is almost no way they can have political decisions and power. At the sub-couty level they can not take policitical decisions that may help to conserve forestry to offset deforestation trends. At the household level to 79 percent of the women interviewed indicated that they can not plant trees without the consent or permission from their husbands. As a result, the Malindi women tree-planting Project has almost stalled. Women have tried to go around the problems by incorporating three male members in the project. How successful this new strategy will be is beyond the scope of this study.

59 percent of the male respondents stressed the importance of training and mobilization as the basis for ensuring the success of tree planting in the sub-county to offset deforestation trends. The reasons for failure of community or farm forestry programmes were given as: lack of

seriousness on the part of forest extension officials; lack of training for local participants; ignorance; erroneous of poor timing of forestry programmes with to rainy seasons; lack of security of land tenure; lack of tree seeds and seedings; too much work and sickness. A more detailed analysis of the performance of Forestry Conservation Programmes is given in the next section 4.5.

4.5 THE ROLE OF FOREIGN AID AND VOLUNTARY AGENCIES

In this section we shall discuss the role played by Foreign Aid Agencies, Non-Governmental Organisations (NGOs) and Forestry Conservation Programmes as instruments for the transformation of local institutional framework for the enhancement of Uganda's forestry management in particular and national development in general.

In Uganda, a multi-purpose project, the Forestry Rehabilitation Project (FRP) was launched in January, 1988 (Uganda Government, Project UG/90/RO2 Implementation status Report. 1992 : 3). The Project has the following as its main objectives to meet domestic needs for timber, fuelwood and other wood products on a sustainable basis, and to increase the area for and improving the management of conservation forests in order to project unique ecological systems such as nature forest reserves. The project components are: Peri-urban plantations development; Farm forestry; Natural High Forest Management and Conservation; Soft wood plantation

rehabilitation; Forest Department rehabilitation and Training (Uganda project Implementation Status Report, 1992: 3).

The expected benefits from the project are increased production and availability of plantation woodfuels and poles; increase of other wood products for the rural population, and conservation of soils in the rural areas. Other anticipated benefits of the FRP are improved management and conservation of natural forests for sustained production and increased revenue collection from forest products for government; increased productivity of softwood plantations; and Forestry Department Institutional strengthening and capacity building (Uganda, Project Document 1987: 26). And according to the Project Document (July - June, 1987), the implementing Agency is the Uganda Government, Forest Department (Uganda, Project Document 1987: 26).

The financing Agencies for the FRP were International Development Agency (IDA), Danish International Development Agency (DANIDA), European Development Fund (EDF), United Nations Development Programme (UNDP), Norwegian Agency for International Development (NORAD) and Carry American Relief Everywhere (CARE) (Uganda Project Document 1987: 20).

Of the Project components Wakisi sub-county was to benefit from Natural High Forest management and conservation, and at a later stage, Farm Forestry. In this section the

analyses of the projects is in the context of the previous analysis in the previous sections of this chapter. Empirical evidence has already been given in the previous sections especially in regard to problems of fuelwood scarcity, livestock production, agrarian issues and community participation in forestry programmes.

The Natural High Forest Management and conservation Component is reported to be progressing steadily (Uganda Project Implementation Report 1992: 2). The physical achievements include; the establishment of tree nurseries, removal of encroachers from Mabira Forest Reserve, construction of houses and revision of Forest Reserve management Plans. In Wakisi sub-county none of the benefits of the physical achievements go to the peasants in solving their basic needs such as fuelwood and fodder. The success of FRP in Wakisi sub-county is seen by the Forest Department in terms of the activities, such as removal of encroachers from Mabira Forest Reserve, that took place within the confines of the Forest Reserve. The apparent low level of concern for provision of basic needs to those who live near Mabira Forest Reserve has increased pressure on the forestyr resources. Thus, illegal activities such as charcoaling, firewood cutting, pitsawing and illegal livestock grazing are still taking place in the Forest Reserve (Uganda, Project Implementation Report 1992: 11). Although the Farm Forestry component is reported to have achievement progress in the

establishment of nurseries in the rural areas and agro-forestry tree species, education and training of farmers on tree growing and establishment of agro-forestry demonstration centres (Uganda Project Implementation Report 1992: 10), none of those activities are near being regarded as a success. All the tree nurseries that had been establishd are, to say the least, in a pathetic situation and essentially no longer functional. Education and training of farmer on tree growing and establishment of agro-foresty demostration centres never took off at all in Wakisi sub-county-under the Farm Forestry component.

The Farm Forestry component suffered disbursement and procurement problems. The flow of funds continued to be a problem both with replenishment of the project account and payments from the special accounts. This prompted DANIDA to propose withdrawing its flow of funds through IDA and channel it through CARE a proposal to which the Forest Department objected to. This was inspite of the fact that DANIDA funds which had been channelled through the Forest Department and IDA had been unsatisfactorily accounted for (Uganda, Project Implementation Report: 5). Of all the six components of FRP it is only the Farm Forestry component that has stalled due to poor accountability. It is reasonable to argue that the Forest Department has not yet fully recognized the importance of involving the peasants in managing forestry resources. The lack of appreciation of people's participation in forestry

resource management has led to bottlnecks like poor accountability of funds by the Forest Department.

The termination of the Farm Forestry component of FRP compounded the problem of deforestation. For, example, the National Tree Planting Programme (NTPP) which was launched on Monday April 7. 1992 was estimated to cost a staggering sum of Ush. 1.0 billion (US $ 1.2 million) to be spread over a period of three years. The money had been estimated to establish 3950 tree nurseries at Resistance Council II(RCII) in all districts of Uganda. The NTPP was to be funded by DANIDA under the Farm Forestry Component (Uganda, New Vision April 13 1992: 1).

The contradictions started with the project document. The format and content of the project document (FRP, July - June 30 1988 are unsuited to tackling the formidable tasks required for a successful conservation programme. This is because the project document dwells mainly on technical issues like the construction of building, number of tree nurseries to be established and number of agro-forestry demostration plots. There is a short anodyne introduction to the economy of Uganda the vegetation and then the project decument emphasizes the need for conservation and the nations laudable attempts to met it. There is no political analysis of the ruling classes and how they express their interests through the state and its institutions. And there is no analysis of the civil society (the peasantry) where the conservation is supposed to happen.

There is little scope for an in-depth analysis of the political - economic context of the conservation programme.

As already argued in chapter three, the post independence forestry conservation policies in Uganda were based on implicit assumptions which have only slowly evolved from a colonial euro-centric and messianic intellectual frame of reference which has endured the waning of empire and the regaining of political independence.

The closure of Mabira Forest Reserve to humans and livestock in 1987 has not, at any rate, been successful because the social context has been analysed insufficiently. As a result, several cases of uncontrolled pitsawing and unlicensed burning of valuable timber for charcoal still exists (Uganda, Project Implementation status Report, 1992:5) The Forestry Department will continue using force to protect the Forest Reserve. This has ended up with the state attempting to protect the environment from the majority of the people who use it. The promotion of protection of Forest Reserves at the expense of helping peasants to develop a culture of forestry conservation and management for fuelwood, fodder, timber, soil protection and economic development will continue to exacerbate deforestation trends.

The programmes have failed to acknowledge the potential conflict between progress in production, consumption and

technology vis-a-vis the environment. Any programme has to address the economic well being of the intended population to ensure success. Further, there is no co-ordination among the various Aid organisation at the sub-county level and this raises the problem of accountability and responsibility. They duplicate work to no avail.

83 percent of our respondents indicated that too many agencies in one area doing the same thing in different ways confuses the peasants. The trend is aggravated by the fact that the Forest Department Officers are natural scientists, foresters and have very little or no socio-economic-cultural biases which are very instrumental in making programmes at the sub-county level a success. Consequently, the programmes have been based on a technical approach and evaded an integrated approach which involves ecological, socio-economic, political, institutional, cultural and gender forces.

Desk supervision has greatly contributed to the failure of the programmes. "Field reports are so irregular and often not verified" (Uganda, Project Implementation Status Report, 1992:5). Project Officers do not have regular contact with villages and hence they do not have an in-depth appreciation of the problems of peasants obtaining on the ground. As a result there is poor monitoring and control of the projects (Uganda, Project Implementation Report 1992: 61).

The few gains from Farm Forestry have been highly differentiated. It is generally practiced by rich peasants who have land to set aside for tree growing. 79 percent of our respondents said that the firewood and poles are sold to urban dwellers rather than to the peasants in the village (See Fig. 21 and 22). Also land belonging to the rich peasants the would otherwise be used for growing food crops is shifted to growing trees and thus lowering land for borrowing and renting by the landless. The shift to tree growing is less labour intensive and reduces chances of employment for the landless. And finally, the poor will have less access to crop residues for fuel.

Fig. 21 Eucalyptus poles ready for sale, 1992

Fig. 22 Eucalyptus posts ready for marketing, 1992

Concluding Remarks to Chapter Four

In this Chapter the researcher has shown on the basis of field/empirical data that deforestation is a threat to the environment and to the people of Wakisi sub-county in particular, and to the growth of Uganda's economy in general. High population density has put pressure on the available forestry resources with devastating effects of deforestation such as scarcity of fuelwood and soil degradation. With a population density of 852 persons per square kilometer, Wakisi sub-county is densily populated.

Forestry resource conservation has been impacted upon by the level of technology, labour and social relations. The poor have found themselves in a vicious cycle of environmental degradation particularly deforestation. The vicious cycle sets in particularly with rising scarcity of fuelwood. The poor resort to the use of crop residues for fuel. The use of crop residues for cooking leads to lower inputs of soil organic matter, poor soil structure, reduced protection from the erosion effects of heavy rainfalls and winds and hence, reduced crop yields. The land is overgrazed and the carrying capacity for livestock declines. The poor are pushed to more marginal areas to cut more forest for new farm land. Land becomes highly fragmented and everything including fuelwood becomes commoditised. The State has done little in addressing fundamental issues that impact upon deforestation and these include: agrarian relations, culture, gender, livestock

production practices, income levels, ownership rights particularly of land trees. Consequently, the state has done little in involving peasants in conserving their environment and addressing the problem of deforestation. The Forestry Conservation policies hitherto pursued have been characterised by Forest Officers protecting the environment and forestry resources in particular which are in Government Forest Reserves with little emphasis on helping the majority of the peasants to conseve forestry resources on the vast expanses of land occupied by the peasants. Finally, current Programmes by the Uganda Government and other Donor Agencies have had little impact on reducing deforestation trends in Wakisi sub-county.

Notes

1. Personal Communication between Researcher and Chairmen of Parish Resistance Councils (RCII) in Wakisi sub-county, September, 1992.

2. For a detailed analysis of the theory of the post-colonial state see: Brett, E.A. 1992. Colonialism and underdevelopment in East Africa, London: Heinemann and Mamdani, M. 1976. Politics and Class Formation in Uganda, London: Heinemann.

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CHAPTER FIVE

SUMMARY, MAJOR FINDINGS, AND RECOMMENDATIONS

5.1 Summary of the Study

Deforestation in Wakisi sub-county in Mukono district in Central Uganda, is a phenomenon that began even before the advent of colonialism. However, the indigenous local institutions had developed mechanisms which performed the co-ordinating and regulatory functions in forestry resource management and use. The long fallow periods which were the traditional practice then, restored soil fertility through regeneration of vegetative and forest cover on the cultivated land. The people had also instituted rules and procedures which ensured social equity, stable livelihood and resource sustainability. However, such traditional systems of resource use and management came under pressure with the onset of colonialism. The spread of cash crop cultivation by peasants put pressure on forestry resources. While crops such as coffee and bananas have beneficial effects on tree conservation, the growth of export commodities such as cotton, peanuts and maize reduced forest cover and soil fertility and increased soil vulnerability to erosion. The deleterious effects on forestry resources are exacerbated by continuous mono-cropping of food crops such as beans. Mono-cropping was a policy that was encouraged by British colonialism.

The colonial economy was basically designed to meet the economic interests of the colonial master. Uganda as a colony was a source of raw materials such as timber, charcoal, rubber and cotton and therefore the colony was designed for exploitation and not for socio-economic development. The alien capitalist class that was encouraged to thrive was just interested in exploitation of the natural resources and not their conservation. As a result during the colonial period very minimum effort was made to develop an institutional framework vital for conserving the forestry resources especially on the vast expanses of public land where crops such as cotton and coffee were cultivated.

Further, the colonial policy of gazetting particular areas as Forest Reserves had the tendency of alienating people from the forestry resources they had conserved for generations. The colonial State protected the forestry resources against expoitation by the local people through strict laws. Emphasis on forestry management was put on the forest estate under colonial administration. Deforestation was exacerbated by the colonial policy of creation of labour reserve areas and concentrating people in the so-called productive areas. The policy of labour reserve areas put pressure on the forestry resources where people had been concentrated. The labourers needed fuelwood and land for growing food crops. The forestry resources gradually got depleted and the result has been deforestation.

At independence in 1962, the post-colonial state inherited the Forest policies and laws that had been designed to suit the interests of colonialism. The post-colonial state continued to utilize and enforce the colonial Forest policies and laws which emphasized resource exploitation rather than Conservation. The policy of exploitation of forestry resources resulted in very disastrous deforestation trends. The socio-economic and political turmoil characterised by corruption, wars, economic decline and dictatorship especially between in 1966 and 1986 further exacerbated deforestation trends.

The efforts by the Forest Department in the early 1970s to recognize the importance of forestry conservation and peasant participation in forestry conservation did not secure or meet with success. The economic decline of the 1970s and the purely technical approach to forestry development and conservation that gripped the Forest Department in that decade (1970s) made the Forest policy an issue on the book-shelves. The Forest Department was therefore not in a position to meet the growing demand for fuelwood and timber for the expanding population without serious deforestation.

Increase in human population has resulted in deforestation. We have shown by empirical evidence from our research that the demographic trends such as migration and fertility have resulted in a population density in Wakisi

sub-county of 852 persons per square kilometer. Population pressure has resulted in a high demand for more agricultural land and forestry resources especially in form of fuelwood. Consequently, the cultivation of marginal lands has intensified and deforestation trends have increased leading to soil erosion and general soil degradation.

Deforestation in Wakisi sub-county has been further enhanced by the type and level of technology used. The low level of technology especially the use of the hoe has resulted in serious land fragmentation resulting in further deforestation. The use of the exe and panga (bush-knife) in harvesting leads to alot of wood waste. On the other hand, large tea-estates such as Mulange and sugar-cane plantations have been established by the clearing of large tracts of land with the adverse effects of deforestation.

Further, the use of inefficient technology in the production, distribution and consumption leads to alot of waste of forestry resources. The earth kilns, the open hearth and use of the "traditional" charcoal stove have led to great losses in what would be otherwise useful wood energy. These wood energy losses have added to deforestation as more wood has to be cut to try and meet the demands for the rural households and urban dwellers.

The production, distribution and consumption of forestry resources is to a great extent controlled by labour and social relations at the local, national and international levels. The poor peasants have to sell their labour to acquire fuelwood. The labour that would be put into economic fields is spent on searching for firewood and crop-residues further aggravating the poverty situation of the poor. Fuelwood is now a commodity to be sold and bought on the market. In Wakisi sub-county it is the men who dominate the sell of charcoal and firewood. Money that would otherwise be spent on meeting other basic needs such as health costs is spent on buying fuelwood.

Livestock keeping forms a significant part of the livelihood of peasants in Wakisi sub-county. The majority of the households own some kind of livestock such as cattle, goats and sheep. Livestock have caused deforestation especially through grazing and browsing. Little pasture and fodder is available for livestock. Consequently, livestock production has become very difficult in Wakisi sub-county. Unfortunately, forestry policies so far are not compatible with livestock production. The tendency is to protect trees against livestock instead of managing trees and livestock for sustained production.

The poor peasants with very small landholdings ranging from less than one acre to five acres, have suffered more dis-proportionately in livestock production than the richer

peasants with larger landholdings ranging from five acres to 100 acres or more. The rich peasants are also able to employ labour to work on their farms and to drive their cattle over long distances in search of good pasture and water.

The sharp socio-economic inequalities between the different categories of peasants, gender and capitalists have resulted in unbalanced agrarian relations. Factors such as small landholding, poor soil fertility and poverty have forced the poor peasants to over-cultivate their landholdings. Further, the growing of seasonal crops such as maize, and beans to meet the demands of Structural Adjustment Programmes (SAPs) for increased production of non-traditional export crops has accelerated deforestation. Consequently, the poor peasants do not get easy access to firewood and hence depend on crop residues for fuel. The land is further deprived of crop manure resulting in poor crop yield and lower incomes.

The crux of agrarian relations is the inequality in land and tree tenure. The majority of peasants lack ownership of land and trees grown on the land especially timber trees. The lack of ownership of land and trees has led to further deforestation and absence of tree planting. Women have suffered more from insecurity of land and tree tenure than men due to cultural barriers and stereotypes.

The unequal agrarian relations have curtailed peasant participation in forestry conservation programmes. Efforts by the state to involve peasants in forestry programmes have been minimal and have not availed much. The local people have not been involved in project formulation and implementation. The inequalities obtaining at the household level and in the community include unequal pattern of landownership and control. In addition, unequal income levels, unequal education levels between the different categories of peasants and gender. These factors preclude the possibility of local people having equal chances of participating in community forestry programmes. Due to unequal patterns of landownership and control, unequal income levels and education, women tree planting projects have achieved very little in terms of tree planting to upset deforestation trends.

The state and donor Agencies involved in community and Farm Forestry programmes have done very little to address the major obstacles to community participation. The International donor Agencies involved in Forestry Rehabilitation Projects have continued in the colonial policy of stressing the protection of Government Forest Reserves. The colonial policy has evaded the urgent need to help peasants develop a culture of Forestry management to meet their basic needs for fuelwood, fodder, food and building poles. Consequently, the programmes by donor Agencies have failed to appreciate and resolve the conflict between progress in production, consumption and

technology vis-a-vis the rational forestry resource development and conservation.

From the foregoing summary of our main research findings, a number of conclusions can be drawn to the factors that have enhanced deforestation and curtailed forestry conservation in Wakisi sub-county in particular and Uganda in general. One of the contributory factors to deforestation is the assumption of state sovereignty over forests thus disenfranchising local communities and creating uncertainty and insecurity of land and tree tenure, and policies and laws governing resource use and access. Further, the rapid expansion of population over the past three decades has greatly intensified the pressure on forestry resources. The pressure on lands, forests, pasture and water is likely to grow to breaking point in the absence of a major expansion of employment opportunities in the non-agricultural sectors and significant intensification of farming, forestry and animal rearing.

Hence, the fate of forestry resources will be determined by the interactions between numerous and economically diverse peasants on one hand and the natural resources from which such peasants derive their livelihood. The peasants have some vested interest in the sustenance of forestry resources for their very existence and way of life are at stake. The fact that many of their activities contribute to the impoverishment

of forestry resources is a powerful testimony to the situation into which the peasants have often been pushed.

One of the promising moves to resolve the apparent conflict between peasants and forestry resources, is the realisation by some planners that forestry conservation is as much about social process as physical ones. And that the major constraints are not technical but socio-economic. However, while socio-economic criteria may often exist in the minds of some planners, there is an alarming failure to relate social and economic needs to acceptable forms of forestry conservation. In the final analysis, if the peasant will not take forestry conservation to heart, no amount of model building, empirical plot studies or legislation will result in the preservation of forestry resources.

Further, biomass energy shortages are partly a function of poverty and the increasing scarcity of fuel is partly a symptom of the underlying economic forces and demographic pressures which are making the poverty worse. Fuelwood scarcity is exacerbated by the exploitation of forestry resources by big capitalists especially in form of firewood, charcoal and timber. Thus, in the formulation of policies and strategies to solve the deforestation problem a number of factors must be integrated and these include; culture, income levels, agricultural and livestock production practices, ownership rights and gender.

Gender relations are an important factor in land and forestry resource management. Gender relations are also an integral part of issues or questions of productivity and forestry resources sustainability as well as those of social equity. A gender perspective is important in informed policy decisions. It goes beyond the dominant women and forestry approaches which focus on women's current roles and look at their face-value concerns through special "women's projects". Such women's projects tend to address the symptoms not the causes of women's resource management difficulties and are likely to be marginalized by powerful male members of the community or taken over by male members of the community.

A grasp of the complexity and centrality of gender relations in "traditional" African life gives specific scope for working towards reinforcing men's and women's shared and complementary interests especially so in managing and harvesting natural resources such as forests.

Social or community forestry initiatives also raise potentially complicated questions of ownership and access, and will often require substantial institutional innovation if they are to succeed. At the sametime, the issue of increased fuelwood production needs to be linked structurally to that of distribution if the schemes are to fulfil their intended aim. The success of the schemes requires full local participation. Unfortunately, such involvement has been circumvented in most

cases by the top-down method of scheme implementation characteristic of the implementing bureaucracy particularly the Forest Department. The top-down method is aggravated by the hierarchical socio-economic structures of the community in Wakisi sub-county. The causes of project failure therefore, lie not in the antagonism between people and trees, but in the antagonism and differential interests between people and people, between forestry officials and communities, between classes and gender

The conflicts between people and people exhibit themselves at the local, national and international levels. International debates more often link the destruction of forestry resources to losses of global biodiversity than to the socio-economic circumstances of the people living in and around them. Because of the danger of marginalizing local issues there is a strong case of orientating a substantial body of policy oriented research towards local people's own perspectives on forestry resources.

Considering forestry and development from the view point of people's own perceptions and priorities mean appreciating how far rural people's views differ from global perspectives or those of government officials or northern donor Aid Agencies. It also means taking account of diversity within rural populations such as between different gender,

people within different social categories and different livelihood groups such as farmers and pastoralists.

5.2 The Major Findings of the Study

5.2.1 Deforestation in Wakisi sub-county is currently a very serious problem. The extent of deforestion can be deduced from the current area of the sub-county which is under forest cover. Whereas in 1965 about 90 percent of present day Wakisi sub-county was under forest cover, by 1992 only about 5 percent of the sub-county is under forest cover.

5.2.2 The main causes of deforestation in Wakisi sub-county include: clearing of land for crop production, logging for timber, charcoaling and felling trees for firewood, building poles and brick-making. Further, a high population density of 852 persons per sq. km has resulted in pressure on forestry resources and hence deforestation. The use of inefficient technology, such as the open hearth in cooking and the axe in harvesting trees results in a lot of woodwaste which in turn leads to enhanced deforestation. Also the establishment of large sugar-cane and tea-estates in the sub-county has led to deforestation. Other causes of deforestation include livestock grazing and browsing, inequitable land and tree tenure-system among households and between peasants of different gender.

5.2.3 Government Policy regarding Forest Reserves encouraged misuse of forest resources and subsequent deforestation

especially during the regime of Idd Amin from 1971 to 1979. During that period people were allowed to move into, live in and cultivate in Forest Reserve Areas.

5.2.4 Large households such as those with more than 10 members consume more firewood than smaller households. Large households consume upto 8000kg of firewood per year. Households which have more young members especially below the age of 14 years need to prepare more meals per day as necessity to feed the young compared to households which have more adult members who can afford to cook fewer meals per day.

5.2.5 The following are the major impacts of deforestation in Wakisi sub-county: reduction in biomass especially scarcity of fuelwood and subsequent increased use of crop residues for cooking; diversion of labour from other productive fields such as cultivation of food crops to fuelwood collection/gathering, and general poverty among the peasants. Further, there is increased drying up of spring water sources, erratic rains and cultivation of marginal lands resulting in soil erosion and siltation of the River Nile.

5.2.6 The Current Forest Policies and strategies that are implemented so as to address the deforestation problem in Uganda in general and Wakisi sub-county in particular do not integrate fully or adequately all issues of culture, gender, agriculture and Livestock production practices, income levels

and ownership rights which are fundamental for a successful forestry conservation programme. This conforms to the second hypothesis of this study which stated that in the formulation of policies and strategies to address the deforestation problem in Uganda in general, and in Wakisi sub-county in particular there is no integrated approach to factors such as culture, gender, agriculture and livestock production practices, income levels, ownership rights, etc.

5.2.7 The majority of employed personnel who work on forestry conservation projects in Wakisi sub-county are technical foresters (and usually males) and hence they cannot easily integrate socio-economic and gender issues in addressing the deforestation problem. Further, project formulation is done by expatriate technical personnel with very little input by the local people who, through experience, know the local socio-cultural and production environment better than the expatriates.

5.2.8 The participation of peasants in forestry conservation projects in Wakisi sub-county is very low. This is partly due to the fact that the multiplicity of policies, bye-laws and strategies pursued so far in tackling the deforestation problem have not involved fully the local communities in project formulation and implementation. Further, differences in socio-economic levels including differences in educational opportunities, preclude the possibility of equal peasant

participantion in forestry conservation projects.

5.2.9 In "traditional" society in Wakisi sub-county women and men used to work together in the management of forestry resources. Normally, it was the women who decided how much wood to use and how much of it to leave on the farms or burn. However, nowadays, with the increased marginalisation of women especially due to commoditisation of forest products and the dominance of men in ownership of land and forest products such as timber, women cannot fully participate in forestry conservation.

5.2.10 There is very little co-ordination of forestry conservation projects both at the national level in Uganda and at the local level in Wakisi sub-county. Lack of co-ordination of projects has resulted in duplication of work especially at the local level.

5.3 **Recommendations**

5.3.1 The deforestation problem in Wakisi sub-county should, as a matter of urgency, be tackled without further delay because the present deforestation trend is already alarming and inaction in addressing this problem is a potential disaster for the livelihood and standard of living of future generations.

5.3.2 The efficiency with which existing supplies of biomass are utilized should be improved through modern energy efficient technologies, including biogas plants and efficient kilns. Improved charcoal stoves of efficiency ranging from 25 to 30 percent should be widely disseminated in order to reduce woodfuel consumption. The Open hearth which is used by the majority of peasants should be improved upon to reduce excessive loss of woodfuel. Further, the use of alternative modern fuels such as electricity and paraffin for domestic purposes should be encouraged.

5.3.3 The Government should institute strategies to encourage peasants to practice family planning to reduce the size of households especially through the provision of appropriate health care programmes targeting both gender.

5.3.4 The amount of biomass resource especially for fuelwood should be increased in Wakisi sub-county especially through the practice of "Agro-silvi-pastoral" system so as to protect marginal lands from soil erosion, improve agricultural output and livestock production, improve on rainfall regimes, protect spring water sources and reduce river siltation.

5.3.5 Water for domestic purposes should be provided in Wakisi sub-county especially through the drilling of boreholes as many spring water sources have dried up.

5.3.6 Policy related analysis must focus also on the process, as well as the immediate outcomes, of gender related forestry resource management.

5.3.7 For personnel working on forestry conservation programmes it is recommended that there should be a mixture of qualified interdisciplinary personnel with a firm grounding on interdisciplinary research methodology orientation, must be with facilities for project implementation and should involve both gender. Expatriate personnel should only be for reinforcing local efforts, enhancing local capabilities and building upon indigenous knowledge, expriences and skills.

5.3.8 Donor Agencies should fully involve local people, including local experts in the design, implementation and evaluation of community projects so as to ensure relevance, appropriate implementation and sustained success of such projects.

5.3.9 It is recommended that organisations working on forestry conservation programmes both at the national and local level should be co-ordinated to avoid duplication of work, waste of resources and confusing peasants. The multiplicity of Donor Agencies and NGOs and their supported projects should be coordinated by committees comprising of village leaders, Government representatives and representative of such Donor Agencies and/or NGOs.

5.3.10 At the national level it is recommended that there should be a strong forest conservation unit for handling/processing data collection, data analysis, strategic policy formulation, policy and programme design and monitoring projects implementation.

5.3.11 A participatory approach to forestry resource conservation is vital for successful forestry programmes. Therefore, local institutions, organisations and groups should be strengthened to manage forestry resources for sustained production. Grassroots democracy and broad based development should be fostered in order to realize forestry resource management and development.

5.3.12 In order to strengthen participatory approach to forestry resources conservation, NGOs and Donor Agencies should focus more attention and offer technical and financial assistance to peasants in Wakisi sub-county. Financial and technical assistance should be used to solve technical problems, to elaborate programmes for raising labour and resource productivity, to conduct research and experimentation.

5.3.13 There should be intensive research to probe various aspects such as livestock production, agriculture and socio-economic factors. Research should involve the local people and should be towards local people's own perspectives on forestry

conservation. Research should develop comprehensive packages for the satisfaction of fuel and other needs such as food of different types of peasant households. It is recommended that there should be an interdisciplinary problem solving approach characteristic of development studies.

5.3.14 The issue of women marginalisation should be addressed especially making sure women get more access to land, trees, credit, education and other services at the national and local levels in order to promote forestry resource conservation and address the deforestation problem. Women should also get more political power at the national and local levels especially in regard to taking decisions concerning the conservation of forestry resources. Government, Donor Agencies and NGOs should then encourage women and men to work together in addressing the problem of deforestation. Adult education should be introduced in Wakisi sub-county for successful forestry resource conservation.

5.3.15 We strongly recommend a structural transformation where there is access and ownership of land and forestry resources for the majority of peasants and particularly women. There should be a land tenure system which incorporates forestry conservation practices and which will encompass not only property rights to land but also to trees.

5.3.16 There should be constant training, sensitization and

conscientisation of all forestry resource producers, distributors and consumers to make them understand all the strategies taken for forestry resource conservation. In addition forestry resource conservation should be part of the school curriculum upto University level.

5.3.17 Government, Donor Agencies and NGOs should follow up the training programmes by helping peasants to establish tree nurseries in rural areas. Water should be provided for nursery establishment especially by drilling of boreholes.

5.3.18 Peasants should be encouraged to use appropriate methods of agriculture such as the use of manure, planting crops which could provide nutrients to the soil such as leguminous plants. Peasants should also be encouraged to keep improved livestock and practice zero-grazing, set up control bands, ridges and practice agro-forestry in their farms.

5.3.19 Appropriate wood harvesting methods such as the use of the hand-saw should be introduced in the villages by the Government and Agencies working on forestry resources consevation projects.

5.3.20 Large-scale users of wood such as Tea-estates and institutions should be encouraged to establish their own woodlots or fuelwood plantations.

Finally, we realise that the implementation of our recommendations outlined above may be slow and halting. This is mainly due to administrative difficulties, technical bottlenecks, conflicts of interest within and between local communities. However, the heightened awareness of the disastrous consequences of deforestation at local, national and international levels, mutuality of interests in forestry resource conservation among different sectors and social groups from the local to global levels provide a favourable platform for concerted effort. Further, the above factors will be made concrete by the existence of indigenous knowledge, skill and inventiveness.

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APPENDIX I

HOUSEHOLD QUESTIONNAIRE

Village ..... Household No. .....

1. Name of Interviewee .....

2. Age ..... yrs

3. Sex ..... a. Male .....
   b. Female .....

4. Educational Qualification

   a. No formal education
   b. Primary 1-4
   c. Primary 4-7
   d. Secondary 1-4
   e. Secondary 4-6
   f. University education
   g. Technical educational
   h. Adult education

5. Marital Status

   a. Not Married
   b. Married .....(date).....
   c. Divorced .....(date)..... Reason .....
   d. Widowed .....(date).....
   e. Separated .....(date)..... Reason .....

6. What are the Major economic activities of this household?

   a. Crop production
   b. Livestock Keeping
   c. Tree production
   d. Wage employment
   e. Other .....(specify) .....

7. Estimated Annual Household income in 1991 and 1992.

   a. Less than 60,000 (UShs)
   b. Between 60,000 and 240,000 (UShs)
   c. Between 240,000 and 600,000 (UShs)
   d. Between 600,000 and 1,200,000 (UShs)
   e. Over UShs 1,200,000.

8. How much land do you own?

a. Less than 5 acres
b. Between 5 and 20 acres
c. Between 20 and 50 acres
d. Between 50 and 100 acres
e. Over 100 acres

9. Have you planted any trees, over the last 5 years?
If yes .....to 10, If No, to 11.

10. If yes, for what purpose?

a. Fuelwood
b. Poles for building
c. Timber for sale
d. Fodder for animals
e. Fruits for food and sale
f. Soil fertility
g. Other .....(specify) .....

11. If No, Why .....(explain) .....

12. What fuel do you use for cooking?

13. Where do you get the fuel from? ..... Estimate distance ..... km.

14. Who collects the firewood? .....who buys the fuel? .....

15. Is there a shortage of firewood in your village .....
If yes go to 16.

16. How do you solve the problem of fuelwood shortage? .....

17. How may of the following livestock do you own

Type	Number
a. Cattle	.....
b. Goats	.....
c. Sheep	.....
d. Pigs	.....
c. Other (specify)	.....

18. What is the pasture status

a. Plenty
b. Just enough
c. Not enough ..... to 19

19. a. If not enough, what do you think are the causal factors for scarcity?

b. How do you make up the requirements for pasture.

20. Is there any NGO or local group working on a programme to plant trees and/or erosion control.

21. Do you carry out any environmental programmes or activities?

Which ones and how often per week? .....

Are they voluntary or by local government rules? ..

Are all people in the village involved in these programmes, If not why? .....

22. Are there government forestry staff assisting and advising you on forestry conservation and tree planting? .....

23. How does the government help in solving your environmental and other problems e.g. ..... provision of tree seedlings, water wells, project funds? ..... etc.

24. How do the Resistance Committees in this area encourage people to plant trees.

25. Have people moved from this household/village to other place over the past five (5) years;

If Ye, which of the following are your reasons for this migration:

a. Poor soil fertility for gainful agriculture
b. Poor availability of water in this village
c. Poor of lack of adequate pasture for livestock in this village
d. Lack of trees for building purposes
e. Other reasons (specify)

APPENDIX II

INTERVIEW SCHEDULE FOR CHIEF AND ELDERS

1. Name of Interviewee .....

2. Age ..... yrs

3. Sex ..... a. Male
b. Female

4. Education Qualification .....

5. Marital Status

a. Not Married
b. Married .....(date).....
c. Divorce .....(date)..... Reasons
d. Widowed .....(date) .....
e. Separated .....(date)..... Reasons

6. What are the major economic activities of this village/sub-county?

a. Crop production
b. Livestock keeping
c. Tree production
d. Other .....(specify)

7. What are the major environmental programmes in this village/sub-county?

8. Who are the people involved in forest conservation programmes in this village/sub-county.

9. What are the government efforts in forest conservation programmes.

10. When did most of the environmental problems in this village/sub-county begin as far as you remember? .....

11. Do you think deforestation has become a big problem in this village sub-county. If Yes, why do you thing it has become a problem?.....

12. What are the patterns of land ownership in this village/sub-county.

13. Have there been any people moving in and out of this village/sub-county over the last five (years) If yes, why?.....

APPENDIX III

INTERVIEW SCHEDULE FOR DEPARTMENT PERSONNEL

1. Name of Interviewee .....

2. Age ..... yrs

3. Sex ..... a. Male
   b. Female

4. Educational Qualification .....Rank/Title .....

5. Marital Status .....

6. What are the main activities of your Department? .....

7. What environmental conservation programmes does your department carry out? .....

8. How do you co-ordinate your activities with other departments in carrying out your activities?

9. Which NGOs and Foreign Aid Organisations are carrying out environmental programmes in the district/sub-county.

10. What suggestions do you give for solving environmental degradation problems in the district/sub-county.

APPENDIX IV

Table of Suggested Tree Species and their uses for Agroforestry Research

Tree Species	Uses
Acacia abyssinica	Fd, Ch, PP, Md, Fod, Bf, Sd, Orn, Nf
A. albida	Fd, Ch, PP, Cu, Ss, Md, Fod, Sd, Mul, Nf, Sc, Wd, TD,
A brevispica	Fd, Md, Fod, Orn, Lf.
A. elatior	Fd, Ch, TF, Md, Fod, Sd, Nf.
A. gerrardii	Fd, Md, Fod, Nf.
A. holocericea	Fd, Ch, TF, FF, Fod, Orn, Mul, Nf, Sc, St. Wd, Lf.
A. lahai	Fd, Ch, TF, PP, OE, Nf.
A. mearnssi	Fd, Ch, TF, PP, FL, TH, Md, Bf, Orn Sc, Wd, Fb, RGG, TD.
A. mellifera	Md, Bf, Nf, Sc.
A. nilotica	Fd, Ch, PP, TH, CU, Md, Fod, Bf, Nf, Sc, St, Wd, RGG, TD, Lf, Tb.
A. polyacantha	Fd, Ch, PP, TH, FF, Md, Fod, Bf, Ec, St, RGG.
A. senegal	Fd, Ch, PP, TH, FF, Md, Fod, Bf, Nf, Wd, Rgg, TD.
A. seyal	Fd, Ch, TF, PP, Fod, Bf, Sd, Orn, Nf, Sc, TD, Lf.
A. tortilis	Fd, Ch, FT, PP, Fod, Bf, Sd, Orn, Nf, Sc, TD, Lf.
A. Xanthophloea	Fd, Ch, FT, PP, Fod, Bf, Orn Nf, TD.

Acokanthera Sch. TH, Md, MUl.

Acrocarpus fraxin. Fd, TF, Bf, Sd, Orn, Mul, Nf, Wd.

Adansonia digitata Fd, CU, Bb, FF, Vg, DS, Md, Fod, Bf, Sd, Orn Mul, Fb, RGG, TD.

Adenanthera pavonina Ug, Sd, Orn.

Afzelia guanzensis TF, Cu, Bd, Md, Sd, Orn.

Albizia amara Fd, Ch, TF, PP, TH, Md, Fod, Orn, Mal, GN, Nf, Sc, RGG, Lf.

A. coriaria Fd, Ch, TF, PP, Bb, Md, Fod, Bf, Sd, Orn, Nf, Tb.

A. gummifera Fd, TF, Bf, Md, Cu, Bb, Sd, Orn, Nf, St, Wd.

A. lebbeck Fd, Ch, TF, PP, FL, Fod, Bf, Sd, Orn Mul, GM, Ec, Nf, Sc, Wd, RGG, TD.

Anacardium occ. Fd, Ch, PP, FF, DS, OE, JS, Md, Bf, Orn, Sc, Wd, RGG, TD.

Annona senegalensis FF, Md, Fod, Orn, Wd, TD.

Azadirachta indica Fd, Ch, TF, PP, OE, Md, Fod, Bf, Sd, Orn, Mul, Ec, Sc, Wd.

Azanza garckeana TH, FF, JS, Fod, Bf, Sd, Orn, Mul, GM, Fb.

Balanites aegypti. Fd, Ch, TF, PP, TH, CU, FF, Vg, OE, Md, Fod, Sd, Mul, Nf, Wd, RGG, Tb.

Balanites orbicul. Fd, Ch, PP, TH, FF, Fod, Sc.

Bambusa spp. PP, Cu, Vg, Fod, Sc.

Bauhinia variegata Fd, TF, TH, Fod, Sc.

Berchemia discolor FT, PP, TH, FF, DS, Fod, Bf, Sd, Orn, Wd, RGG, Lf, Tb.

Borassus aethiopum TF, PP, TH, FF, Vg, DS, OE, Fb, TD.

Boscia coriacea	Fd, TF, PP, CU, FF, Md, Fod, Bf, Tb.
Brachylaena hullen.	Fd, Ch, PP, Cu, Sc.
Brachystegia Sp.	Fd, TF, Md, Fod, Sd, Nf.
Bridelia micrantha	Fd, Ch, FF, PP, TH, FF, Md, Fod, Sd, Mul, Nf.
Cadaba farinosa	Fd, Vg, SS, Md, Fod.
Caesalpinia decapetala	Md, Fod, Bf, Orn, Mul, Gm, Nf, Lf.
Cajanus cajan	Fd, FF, Fod, Bf, Ec, Nf, Sc, Wd, TD.
Calliandra calothyruss	Fd, PP, Fod, Bf, Sd, Orn, Ec, Nf, Sc, Wd, TD.
Callistemon citrinus	Fd, Ch, Bf, Sd, Orn, Wd.
Colodendrum capense	Fd, Ch, TF, PP, TH, Bf, Sd, Orn, Mul, Wd.
Carisa edulis	Fd, FF, Vg. DS, Md, Orn, TD.
Cassia siamea	Fd, Ch, TF, PP, Md, Fod, Bf, Sd, Orn, Mul, EC, Wd, Bm.
Cassia spectablis	Fd, Ch, PP, TH, Sd, Orn, Mul, Wd.
Casuarina cunni-nghamiana	Fd, Ch, TF, PP, Fod, Orn, Mul, Gm, Nf, Sc, Wd.
Casuarina equisetifolia	Fd, Ch, TF, PP, TH, Bb, Fod, Orn, Mul, GM, Ec, Nf, St, Wd, TD, Lf.
Ceibs pentandra	Fd, TF, Md, Fod, Sd, Orn, Sc, Fb.

Combretum molle	Fd, PP, TH, Md, Fod, Bf, Mul, GM.
Combretum schumanni	Fd, Ch, TF, PP, TH, Cu, Md, Bf, Mul, GM.
Commiphora african	Fd, CU, FF, DS, Md, Fod, Orn, RGG.
Commphora eminii	Fd, TF, Md, Fod, Sd, Sc, Lf, Bm.
Conocarpus lancifolius	Fd, TF, TT, Ch, PP, TH, Bb, Fod, Bf, Sd, Orn, Mul, Gn, Ec, Sc, Wd.
Cordeaaxia edulis	Fd, FF, Fod, Bf, Mul, Gm, Ec, Nf. Sc, TD.
Cordia Africana	Fd, TF, Cu, FF, Md, Bf, Sd, Orn, Mul, Gm, Sc, Fb, RGG.
Cordia sinensis	Fd, TF, PP, Cu, FF, Md, Fod, Bf, Fb, RGG, Bm.
Croton macro-strachyus	Fd, Ch, PP, TF, Md, Bf, Sd, Orn, Gm, Lf, Bm.
Croton mega-locarpus	Fd, Ch, TF, PP, Md, Bf, Sd, Orn, Gm, Lf, Bm.
Cupressus lusitanica	Fd, TF, PP, Sd, Orn, Wd, Lf, Tb, Bm.
Cyphomandra betacea	FF, Vg, Js.
Dalbergia melanoxylon	Fd, CU, Md, Fod, Mul, GM, Nf.
Dalbergia sisoo	Fd, Ch, TF, PP, TH, CU, OE, Fod, Bf, Sd, Orn, Ec, Sc, St, Wd, Td.
Delonix regia	Fd, Bf, Sd, Orn,

Dicrostachys cinera	Fd, Ch, PP, TH, Md, Fod, Bf, Nf, Sc, Fb, Lf.
Diospyros mespiliforms	Fd, Ch, TF, CU, FF, Md, Fod, Bf, Sd, Orn, Mul, Gm, Nf.
Diospyros scabia	Fd, Ch, TF, CU, Md, Fd, Bf, Sd, TD.
Dobera glebra	Fd, TF, CU, FF, Fod, Sd, RGG.
Dodonea angustifolia	Fd, Ch, TF, PP, TH, Md, Fod, Bf, Sd, Orn, Ec, Wd, Lf.
Dombeya goetzenii	Fd, TF, Md, Bf, Mul, Gm, Fb.
Dombeya Rotundifolia	Fd, TF, Md, Fod, Bf, Orn, Bf.
Dovyalis caffra	FF, JS, Fod, Bf, Orn, Lf.
Ekebergia Capensi	FT PP, TH, Fod, Bf, Sd, Orn, Wd.
Entada abyssinica	Fd, Md, Fod, Sd, Orn, Nf.
Eriobotya japonica	Fd, PP, CU, FF, JS, Bf, Sd, Orn, Mul, Wd.
Erythrina abyssinica	Fd, CU, Md, Fod, Bf. Orn, Mul, Nf, Sc.
Eucalyptus Camaldulensis	Fd, Ch, TF, PP, OE, Fod, Bf, Sd, Orn, Sc, Wd, TD.
Eucalyptus citriodora	Fd, TF, PP, Bf. Orn, Wd, RGG.
Eucalyplus globulus	Fd, Ch, TF, PP, Md, Bf, Sd, Wd.

Eucalyptus saligna	Fd, Ch, TF, PP, VP, Md, Bf, Sd, Wd.
Euclea divinorum	TF, TH, FF, Md.
Euphorbia tirucalli	Fd, Md, RGG, Lf, BM.
Faurea saligna	Fd, Ch, TF, PP, Md, Bf, Orn, Mul, Wd, TD.
Ficus Sycomorus	Fd, CU, FF, Md, Sd, Orn, Mul.
Ficus thonningii	Md, Fod, Sd, Orn, Mul, GM, Fb, RGG, Lf.
Flacourtia indica	Fd, TF, FF, Md, Fod.
Flemingia macrophylla	Fd, Md, Fod, Mul, Sc, TD.
Fraxinus pennsy vanica	Fd, TF, PP, Fod, Bf, Orn, Wd.
Garcinia livingstone	FF, Md, Fod, Sc.
Gliricidia sepium	Fd, Ch, TF, PP, TH, Vg, OE, Fod, Bf, Sd, Orn, Mul, GM, Nf, Sc, Wd, Bm.
Gmelina arborea	Fd, Ch, TF, PP, VP, TH, Fod, Bf. Sd, Orn, Sc, St, Wd.
Grevillea robusta	Fd, Ch, TF, PP, VP, Fod, Bf. Sd, Orn, Mul, Gm, Wd, Bm.
Grewia bicolor	Fd, TF, PP, TH, CU, FF, Md, Fod.
Grewia villosa	Fd, TF, PP, TH, FF, Md, Fb.
Hagenia abyssi	Fd, TF, PP, Fb, CU, [illegible] Orn, Gm, Sc.

Hakea saligna	Sd, Orn, Sc, Wd, Lf.
Hyphaene Compressa	Fd, PP, CU, Bb, FF, Ss, Sd, Fb, Th.
Hymenaea verrocasa	FT, Bb, RGG.
Jacaranda mimosifolia	Fd, PP, CU, Bf, Sd, Orn, Mul, Wd.
Juniperus procera	Fd, TF, PP, Fl, Md, Bf, Orn, Wd.
Kigelia Africana	Ch, PP, Ss, Md, Fod, Bf, Sd, Wd.
Lamnea Schweinfurthii	CU, FF, Md, Fod.
Lawsonia inermis	TH, Md, Fod, Th, TD.
Leucaena leucocephala	Fd, Ch, TF, PP, Fod, Bf, Sd, Orn, Mul, Gm, Nf, Sc, Wd, TD, Lf.
Macademia tetraphylla	Ch, TF, FF, OE, Bf, Orn, Wd.
Maerus subcordata	Fd, TF, PP, VP, OE, Fod, Sd, Orn.
Maesopsis eminii	Fd, TF, PP, VP, OE, Sd, Orn,
Mangifera indica	Fd, FF, Ds, Fod, Bf, Sd, Orn, Mul, Gm, Sc, Wd, RGG.
Manihot glaziovii	Fod, Sd, Orn, EC.
Manilkara sansibarensis	TF, FL, Bb, FF, RGG.
Markhamia lutea	Fd, Ch, TF, PP, TH, Bb, Md, Bf, Sd, Orn, Mul, Sc, Wd.
Melia azedarach	Fd, TF, PP, TH, Md, Bf, Sd, Orn, Sc, Wd, Lf.

Melia volkensii	Fd, TF, Md, Fod, Bf, Mul, Gm, EC.
Millettia dura	PP, TH, Fod, Sd, Orn, Mul, Gm.
Mimosa scabrella	Fd, TF, PP, Sd, Orn, Mul, Gm, Nf, Sc, Lf.
Maringo oleifera	PP, FF, Vg, OE, Md, Fod, Bf, Sd, Sd, Wd, TD.
Myrianthus holstii	Fd, Ch, FF, Fod, Sw, Wd.
Newtonia buchananii	TF, Bb, Fod, Sd, Orn, Mul, Nf.
Ocotea usambarensi	TF, VP, Md.
Olea europaea	Fd, Ch, TF, PP, Fl, TH, CU, FF, Ss, Md, Bf, Orn, Wd, Tb.
Olea hochstetteri	Fd, TF, VP, Md.
Olea Welwitschii	Fd, TF, VP, Md.
Ozoroa insignis	TF, OE, Md.
Pappea capensis	Fd, TF, PP, FF, OE, Md, Fod, Bf, Sd, Orn.
Parkinsonia acueata	Fd, Ch, Md, Fod, Bf. Orn, Mul, Gm, EC, Nf, St, Sc, Lf.
Persea americana	Fd, FF, Sd.
Phoenix reclinata	Fd, PP, TH, FF, Md, Fod, Orn, Mul, Th.
Piliostigma thonningii	Fd, FF, Orn, Fb, Th, TD.
Pinus patula	Fd, TF, PP, Sd, Orn.

Pithecellobium dulce	Fd, PP, FF, Ds, OE, Fod, Bf, Sd, Sc, Fb, RGG, Lf.
Podocarpus falcatus	Fd, TF, PP, VP, Md, Sd, Orn.
Podocarpus latifolius	Fd, TF, PP, Fl, Md, Sd, Orn.
Polyscias kikuyuensis	Fd, TF, VP, CU, Md, Mul, Gm, Sc.
Prosopis chilensis	Fd, Ch, TF, PP, FF, Fod, Bf, Sd, Orn, Nf, Sc, st, Wd, RGG, TD.
Prosopis joliflora	Fd, Ch, FT, PP, CU, FF, Vg, Md, Fod, Bf, Sd, Nf, Sc, Wd, Lf.
Prunus africanus	Fd, Ch, TF, PP, TH, Md, Bf, Sd, Orn, Gm, Wd.
Psidium guajava	Fd, VP, FF, Ds, OE, Md, Sc, TD.
Rhus natalensis	Fd, FF, Md, Fod, Sd, Ec, Tb.
Samanea saman	TF, TH, CU, FF, Fod, Sd, Orn, Nf, RGG.
Schinus molle	Fd, Ch, PP, Ss, Md, Bf, Sd, Orn, Sc, Wd, RGG, Lf.
Sesbania bispinosa	Fd, PP, Md, Fod, Sd, Mul, GM Nf, Sc, St, Wd, Fb, RGG.
Sesbania sesban	Fd, PP, Fod Sd, Mul, Gm, Nf, Sc, St, Fb.
Spathodea campanulata	Fd, Ch, CU, Md, Bf, Sd, Orn, Mul, Wd.
Strychnos henningsii	TH, DS, Md.
Stychnos spinosa	Fd, TF, FF, Md, Fod.

Syzygium cuminii	Fd, Ch, TF, PP, TH, FF, Md, Fd, Bf, Sd, Orn, Gm, Wd, TD.
Syzygium guineense	Fd, Ch, TF, PP, PH, FF, Md, Fod, Bf, TD.
Tamarindus indica	Fd, Ch, TF, PP, CU, Bb, Ss Ds, Md, Fod, Bf, Sd, Orn, Mul, Nf, TD.
Teclea nobilis	Fd, Ch, TF, PP, TH, Md.
Teclea trichocarpa	Fd, Ch, PP, Sd, Orn.
Terminalia brownii	Fd, Chi, TF, PP, TH, CU, Md, Fod, Sd, Mul, EC, TD.
Terminalia catappa	FF, Sd, Orn, TD.
Terminalia mentally	Sd, Orn.
Terminalia prunioides	Fd, TF, PP, TH, Mul, Gm.
Terminalia spinosa	Fd, Ch, TF, PP, Lf.
Thevetia peruviana	Md, Sd, Orn, Sc, Lf.
Tipuana tipu	Fd, Ch, TF, PP, Fod, Bf, Sd, Orn, Wd.
Trema orientalis	Fd, Ch, TF, PP, Md, Fod, Bf, Sd, Orn, Mul, Nf.
Trichilia emetica	Fd, TF, PP, Md, Fod, Bf, Sd, Orn, Wd, RGG.
Vangueria madagscariensis	Fd, TF, CU, FF, Md.
Vernonia amygdalina	Fd, Ch, Vg, Md, Fod, Orn, Sc, Lf, Tb.
Vitex doniana	Fd, Ch, TF, PP, CU, FF, Vg, Md, Fod, Bf, Sd, Mul, Nf, TD.

Vitex keniensis	Fd, TF, VP, FF, Wd.
Warburgia ugandensis	Fd, TF, Ss, Ds, Md, Fod, Sd, Orn, Mul, Gm, Sc, RGG.
Ximenia americana	Fd, TH, FF, Md, Fod.
Zanthoxylum chalybeum	Fd, Md, Fod.
Zizyphus mauritiana	Fd, Ch, TF, PP, TH, CU, Bb, FF, Ds, Md, Fod, Bf, Sd, Sc, Wd, Lf, RGG, TD.

Legend:

Fd	-	Firewood	Orn	-	Ornamental
Ch	-	Charcoal	Mul	-	Mulch
TF	-	Timber/Furniture	Gm	-	Green manure
PP	-	Poles/Posts	Ec	-	Erosion control
FL	-	Flooring	Nf	-	Nitrogen - fixing
VP	-	Veneer/Plywood	Sc	-	Soil conservation
TH	-	Tool Handles	St	-	Soil stabilization
CU	-	Carvings/Utensils	Wd	-	Windbreak
Bb	-	Boat building	Fb	-	Fibre
FF	-	Fruit/Food	Th	-	Thatch

Vg	-	Vegetable	RGG	-	Resin/Gum/Glue
Ss	-	Seasoning	TD	-	Tannin/Dye
DS	-	Drink/Soup	Lf	-	Live fence
OE	-	Oil/Edible gum	Tb	-	Tooth brushes
JS	-	Jam/Syrup	Bm	-	Boundary marking
Md	-	Medicine			
Fod	-	Fodder			
Bf	-	Bee forage			
Sd	-	Shade			

APPENDIX V

The 1929 Forest Policy Statement.

The 1929 Forest Policy gave the following set of objectives

1. To retain under forests or afforest all areas of land the retention of which under forest is considered necessary on climatic or other indirect grounds.

2. To meet with due regard to vested rights such of the demands of the population of Uganda as cannot be met by individual or local administration efforts.

3. To advise individual and local native administrations in all matters appertaining to arbori culture or forestry.

4. In so far as it is consistent with the three proceeding objects to manage the State forests of Uganda so that they will give the best financial returns on the capital invested.

APPENDIX VI

The 1939 Forest Policy Statement.

The 1939 Forest Policy Statement had the following objectives.

1. Reservation by the state of suitably situated areas of land, either already under forest or capable of afforestatin, of sufficient extent for the maintenance of climatic conditions suitable for agriculture for the preservation of water supplies, for the provision of forest produced required in agriculture and industrial development or for demostic use, and for the prevention of erosion on land liable to destruction if put to other uses.

2. Management of the Forest property of the state so as to obtain the best financial returns on its capital valve and the expenses of management, in so far as such returns are consistent with the primary objects of management set out above.

3. Ecouragement and assistance of forestry undertaken by Native Authorities and private enterprise.

4. Building up by education and propaganda of an understanding among the people of the value of forests to them and to posterity, and the technical aducation African foresters.

APPENDIX VII

The 1948 Forest Policy Statement.

1. To reserve in perpetuity, for the benefit of the present inhabitants of Uganda and of posterity, sufficient land (either already forested or capable of afforestation) to maintain climatic conditions suitable for agriculture, to preserve water supplies, to provide forest produce for agricultural, industrial and domestic purposes, and to maintain soil stability in areas where the land is liable to deterioration if put to other uses.

2. To manage the forest estate to obtain the best returns on its capital value and the expenses of management in so far as such returns are consistent with the primary aims set out above.

3. To foster, by education and propaganda, a real understanding among the people of Uganda of the value of forests to them and their descendants.

4. To encourage and assist the practice of sound forestry by Local Authorities and provide enterprises, and to educate selected Africans in technical forestry.

APPENDIX VIII

The 1970 Forest Policy Statement.

The 1970 Forest Policy Statement had the following objectives.

1. To reserve in perpetuity adequate land as forest estate so as to ensure;

   i) a sustained production of timber and other forest products for the needs of the country, and where feasible for export also;

   ii) protection of water catchments, soils, wildlife, and amenity of land.

2. To develop that estate so as to obtain maximum production of wood for the lowest investment or to obtain the maximum financial return on investment.

3. To ensure efficient conversion of wood and wood products so as to reduce waste.

4. To carry out extention services aimed at

   i) helping farmers, organisations and other people to grow and protect their own trees.

   ii) educating the public about the role of forestry and forest industries for their welfare.

   iii) advising industries and users of wood on suitability and availability of various types of wood and wood products for various uses.

APPENDIX IX

GENERAL NOTICE No. 3 OF 1988

UGANDA, MINISTRY OF ENVIRONMENT PROTECTION, NOTICE

FOREST POLICY

The current Forest Policy of the Republic of Uganda is a follows:-

I. To maintain and safeguard enough forest land so as to ensure that:

1. sufficient supplies of timber, fuel, pulp, paper, poles and other forest products are available in the long-term for the needs of the country, and when feasible for export;

2. Water supplies and soil are protected, plants and animals (including endangered ones) are conserved in natural ecosystems, and forests are also available for amenity and recreation.

II. To manage the forest estate so as to optimise economic and environmental benefits to the country by ensuring that:-

1. The conversion of the Forest resources into timber, charcoal, fuelwood, poles, pulp and paper, and other products is carried out efficiently;

2. The forest estate is protected against encroachment, illegal tree cutting, pests, diseases and fires.

3. The harvesting of timber, charcoal, fuelwood, poles and other products applies appropriate sulviculture methods which ensure sustainable yields and preserves environmental services and biotic diversity.

4. Research is undertaken to improve seed sources for planting stock and the silviculture and protection methods needed to regenerate the forest and increase its growth and yield. Research is also carried out into new and existing products, including tourism and education with an aim of maximizing their utilization potential. Research is undertaken to monitor and promote the preservation of environment services and conservation for biotic diversity.

III. To promote an understanding of forests and trees by:-

1. Establishing extension and research services aimed at helping farmers, organisations and individuals to grow and protect

their own trees for timber, fuel and poles and to encourage agroforestry practices;

2. Publicising the availability and suitability of various types of timber and wood products for domestic and environmental services provided by forests;

3. Holding open days at regular intervals in all districts to demonstrate working techniques and bring attention to the positive benefits of forestry;

4. Promoting scientific research, environmental tourism, education and related activities inside the forest estate.

J.W. Okune

Minister of Environment Protection

Kampala 12th October, 1987.

APPENDIX X

List of Encroachers in Mabira Forest Reserve (Compiled by Ugand Government, Forest Department. Ref: BR/4/2. 23rd November, 1987: 3).

List of Encroachers per compartment/block

Compartment/Block	Number of Farm Families
171	293
172	310
173	240
174	245
175	62
176	3
177	2
178	29
179	112
180	230
181/183	340
184	170
185	259
186	3
187	23
188	91
189	176
190	67
191	1
194	169
196	88
197	1
198	1
199	1
202	55
203	62
204	1
205	92
Namawanyi	24
Namananga	59
Kalagala Falls	174

List of Foreign Nationals who enchroached on Mabira.

Nationality	Number of Farm Families
Barundi	40
Kenyans	2
Tanzanians	19
Rwandese	48
Zaire	83
Sudanese	18
Total	210

List of Encroachers Per District of Birth.

District	Number of Farm Families
Arua District	32
Bushenyi District	3
Hoima District	2
Kabarole Districtct	4
Kamuli District	193
Kampala District	91
Kabale District	44
Iganga District	671
Jinja District	136
Lira District	2
Luwero District	125
Madi District	2
Masaka District	58
Masindi District	2
Mukono District	1395
Mubende District	30
Mbarawa District	6
Mbale District	139
Mpigi Distict	106
Nebbi District	2
Rakai District	4
Rukungiri District	6
Soroti District	9
Tororo District	234
Total	3296