Forestry Outlook Studies in Africa (FOSA)

Uganda

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Please note that the views expressed in this paper reflect those of the authors and should not be attributed to any of the institutions.

This paper has been minimally edited for clarity and style.

ABBREVIATIONS USED IN THE REPORT

AFWC	-	African Forestry and Wildlife Commission
CBFM	-	Collaborative Forest Management
CBO	-	Community Based Organizations
CDM	-	Clean Development Mechanism
DFID	-	Department for International Development
ESD	-	Energy for Sustainable Development
ESMAP	-	Energy Sector Management and Assistance Program
EU/UK	-	European Union/United Kingdom
FAO	-	Food and Agricultural Organization of the United Nations
FD	-	Forest Department
FF	-	Farm Forestry
FOSA	-	Forestry outlook Study
FRM&CP	-	Forest Resource Management and Conservation Plan
FA	-	Forestry Act
FSUP	-	forestry Sector Umbrella Program
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GHGs	-	Green House Gases
GoU	-	Government of Uganda
ICRAF	-	International Council for Research in Agro forestry
IFF	-	Intergovernmental Forest Forum
IGAD	-	Intergovernmental Agency for control of Desertification
IPF	-	Intergovernmental Panel for Forests
NARO	-	National Agricultural Research Organization
NEMA	-	National Environment Management Authority
NFA	-	National Forest Authority
NGO	-	Non-Governmental Organization
NORAD	-	Norwegian Agency for Development Cooperation
NWFP	-	Non Wood Forest Products
MAAIF	-	Ministry of Agriculture Animal Industries and Fisheries
MFPED	-	Ministry of Finance, Planning and Economic Development
PAF	-	Poverty Eradication Fund
PEAP	-	Poverty Eradication Action Plan
PMA	-	Plan for Modernisation of Agriculture
UFD	-	Uganda Forest Department
UFSUP	-	Uganda Forestry Sector Umbrella Program
UK	-	United Kingdom
UIA	-	Uganda Investment Authority
UNFCCC	-	United Nations Forum for Convention on Climate Change
UNIDO	-	United Nations Industrial Development Organization
UNDP	-	United Nations Development Program
UWA	-	Uganda Wildlife Authority
FORI	-	Forest Research Institute
THF	-	Tropical High Forests
TOF	-	Trees outside Forests
SADC	-	Southern African Development Community

WWF - World Wild Fund

SUMMARY

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Overview of the most important expected changes

Uganda will continue to experience rapid population growth in the next 20 years. Economic growth has been projected at 7% per annum but this will largely depend on peace and stability in all areas in the region and the success of the proposed government programs of poverty eradication modernisation for agriculture. The following important changes are expected to impact on the forestry sector in the next 20 years:

- Increased demand for forest products such as fuel wood and construction materials due to a rapid population growth in Uganda coupled with increased incomes. This is expected to accelerate deforestation. The most threatened forests are those located on privately owned land and the government owned forest plantations. It is expected that in 2020 there will be a shortage of sawn timber in Uganda.
- Increased agricultural expansion into forested areas and woodlands to cater for the growing population.
- Improved agricultural production through intensification of agriculture and an increased knowledge in productive agricultural methods will reduce the pressure to convert forestland into agricultural land. This is in line with the proposed modernisation of agriculture. Through this process it is expected that farm forestry will make significant contributions towards the provision of fuel-wood and poles for construction among other tree products in Uganda. It will also be instrumental in afforestating marginal lands.
- Collaborative forestry management will be an important form of forestry management especially where land is communally owned.
- Eco-tourism in Uganda will be more developed and better marketed by the private sector and it will be an important source of revenue. Natural forests will be managed more for their environmental values than for their productive functions.
- There will be better regulations for the access to the genetic resources in our forests. Uganda will be earning money from bio-prospecting ventures using our bio-diversity. The country will also be in a better position to tap the global initiatives on forestry and environment protection to finance more investments in forestry.
- Commercialisation of some NWFP will increase.
- The government institutions involved in the management of forestry will be more coordinated with clearer roles and responsibilities. They will be more focused on facilitation than management.
- Adoption of more non-timber materials in building construction and adoption of non-wood fuels to a large extent especially by the urban communities. This is assuming Uganda can sustain an economic growth of 7% as projected.

Recommendations

There is no doubt that Uganda has a high potential for forestry development that has not been adequately exploited. While there is an increased awareness of the environmental importance of trees, there are insufficient incentives to pursue tree planting and sustainable forestry management. The key issue therefore is how to motivate people to take a deeper interest in investing in forestry including sustainable management of the forest resource base. There is need to explore ways of narrowing the gap between policy formulation and implementation as well as to promote activities that reduce pressure and dependency on land and tree resources. The chapter on accomplishing the vision has made detailed recommendations to this effect.

PREFACE

The Uganda forestry outlook study is a concise account of the general direction of development of the forestry sector in 2020. It outlines the current status and trends as well as the vision of the forestry sector in Uganda in the year 2020. It designed to critically examine the internal and external factors influencing the forestry sector, assess their implications, construct future scenarios and formulate a national vision for the forestry sector in the year 2020. The process is participatory, involving major stakeholders from government departments as well as from the private sector and non-governmental organizations.

The Uganda forestry outlook study feeds into the forestry outlook study for east African sub region that will in turn contribute to the production of the final product, the Forestry outlook for the year 2020 also known as FOSA. The study is an analysis of the future potential of the forestry sector to contribute to the well being of the African citizen through it's economic, social and environmental functions. It analyses the status, trends and driving forces shaping African forestry. The primary objective of FOSA is to serve the development needs of the forestry sector in Africa. FOSA strives to identify policies, programs and investment options that will drive the forestry sector in a desirable direction. It aims at providing a framework and focus for investment in Africa. FOSA intends to provide lending institutions; investors, development partners and the private sector a basis for review of their forestry portfolios.

FOSA was initiated by FAO at the request of the African countries through the African Forestry and Wildlife Commission (AFWC) at their 11th meeting held in Dakar, Senegal in April 1998. FAO is working in collaboration with African Development Bank and European Commission in the development of FOSA. FAO continues to seek the participation of other institutions such as World Bank, IGAD, SADC, non-governmental organizations and the private sector in the implementation of FOSA.

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It is my sincere hope that this study will make a contribution towards the eradication of poverty in Uganda.

1. INTRODUCTION

1.1 Uganda's Vision for the 21st Century

Uganda is a country with high potential for effective conservation, sound sustainable natural forest management and viable timber plantations. It has great potential for sustained economic growth. Despite her small size of only 0.02% of the world's total dry land area, Uganda has over 11% and 7% of the known world's total of species of birds and mammals respectively. It is not surprising therefore, that she was referred to as the "pearl of Africa" by Sir Winston Churchill at the start of the century. The translation of this potential into reality has been curtailed by several factors. The major factor has been bad governance and politics of the last 30 years that has led to the destruction of people, infrastructure and the economy. Consequently, Ugandans have experienced poverty, low levels of human development and environmental degradation resulting in the country being one of the poorest in the world. Today, about 46% of Uganda's population live below the poverty line.

The greatest challenge for the government in Uganda today is how to address the issue of poverty. It is the vision of all Ugandans to restore the 'pearl of Africa' to its former glory. Through a wide consultative process, Ugandans from all walks of life agreed on a collective vision for the country. The vision for Uganda for the 21st century is that of **"a prosperous people, harmonious nation and beautiful country"** (MFPED, 2000; Vision, 2025). Uganda's Vision 2025 will provide a planning framework for the country for the next 25 years.

1.2 Uganda's Forestry Sector Vision

Uganda depends heavily on subsistence agriculture as the main source of livelihood. Agriculture is sustained by about 85% of the population who are rural based. The agricultural sector is largely undeveloped characterised by family labour, rudimentary technology, poor crop husbandry, lack of improved seed, lack of pesticides, lack of fertilisers, a land use policy and with a low rate of land use. It is against such a background that the role of forestry in the development of Uganda is considered as crucial in the eradication of poverty.

The Uganda Forest Policy states the country's forestry sector vision as: a sufficiently forested, ecologically stable and economically prosperous Uganda. A national forestry program is being developed to ensure the conservation, management and sustainable development of the forests to meet local, national, regional and global needs and requirements for the benefit of present and future generations. Although there has been a long period of upheaval and considerable damage to some forests, there is still a solid ecological basis from which sustainable forestry can operate. It is part of Uganda's development strategy that forest resources play a full part in development to maximise the positive impact on poverty.

1.3 Status of the Forestry Sector in Uganda

1.3.1 The Natural Forests

Uganda's forests fall into two major categories namely the natural forests and the plantations. Natural forests supply the bulk of forest products but plantations are gaining prominence. High Forests in Uganda were in the past degraded so much such that only 100,000 to 200,000 ha can be considered as 'productive' forest. It is estimated that of this only 50,000 ha are exploitable. The rest is so degraded that it will have to be protected for at least another 20 years. In 1995, the Forest Department estimated that an annual allowable cut of about 200,000 cubic meters would be yielded from natural forest reserves in the next 15 years (Forest Department, 1995). In 1995, it was

estimated that an annual allowable cut of about 100,000 cubic meters of wood would be yielded from public and private forests within the next 15 years (Forest Department, 1995).

At the beginning of the century, the tropical high forests (THF) under government ownership covered about 3,090,000 ha or 12.7% of the country. Current estimates indicate that the THF estate under government ownership has now been reduced to 730,000 ha or 3.6% of Uganda's land area (Forest Department, 1999). Current predictions estimate that if allowed to continue at the present rate, wetlands and open water areas will be reduced to 4,500 km^2 and 36,900 km^2 respectively by the year 2006 (Forest Department, 1996). Deforestation in Uganda has mainly been due to a rapid increase of a population with no other economic options coupled with breakdown of law and order during the turbulent years of the 1980s. During that time, forest reserves were cleared indiscriminately.

1.3.2 Forest Plantations

The existing forest plantations were established in the 1960 and 70s. They are in a poor state. Data on their productivity is scanty. In 1995, it was estimated that an annual allowable cut of about 150,000 cubic meters was expected from the forest plantations for the next 15 years (Forest Department, 1995).

Despite a favourable climate and soils, Uganda has only a limited area of timber plantations, mainly pine and cypress. These are mostly mature or semi-mature but years of neglect have led to fire damage. Lack of pruning and thinning has reduced the potential value for high quality timber. Industrial forest plantations in Uganda consist of softwood or conifer and hardwood plantations. They cover about 345 km^2 of which the majority is planted with softwoods. Government owned plantation forests are estimated at 240 km^2 making up only 2.2% of gazetted forests. The main objective of the plantation establishment is to provide raw material to forest industries in the form of saw logs and or pulpwood (Falkenberg et al, 2000).

Most of the hardwood plantations (eucalyptus) are in peri-urban areas for the purpose of supplying mainly fuel-wood and poles to urban enterprises. The Forest Department owns about 900 hectares of these plantations while about 1,000 hectares belong to the private sector but is on reserved land.

The private sector, especially tea and tobacco processing companies has also established plantations. Private woodlots are also scattered all over the country. These private wood lots and plantations are estimated to cover an area of about 13,000 ha (NORAD, 1999).

1.3.3 Threats to the Forest Estate

In the last 100 years Uganda's forests have faced severe pressures mainly from agricultural conversion as a result of population increase, urban demand for charcoal, over grazing, uncontrolled timber harvesting and policy failures. The forestry cover has shrunk from 45% in 1890 to the present 20.3 % of the total land area in Uganda. Currently, the rate of deforestation is estimated to be about 1% per annum (Kigenyi, 1995). The annual cost of deforestation in Uganda has been conservatively estimated at US$ 3.8 –5.7 million per year (Falkenberg et al, 2000). Currently, deforestation is minimal on gazetted forest reserves, it is mostly occurring on privately owned or ungazetted public forests. Military warfare in Uganda has contributed much to deforestation. Uganda has had a turbulent history and sometimes guerrilla groups launch their attacks from forests and woodlands. This has led to poor management of forests and in the past, clearance of some forest in search of rebels. Today rebels have occupied Rwenzori Mountains in Uganda since 1997. This

has prevented any meaningful conservation activity indeed in December 1999 UNESCO added this site to its list of world heritage sites in danger.

1.3.4 Economic Contribution of the Forest Sector to Gross Domestic Product

In Uganda, the value of forestry in terms of its contribution to the national welfare or even gross domestic product (GDP) is very difficult to estimate. This is due to lack of adequate data on its output and services. Environmental services at the moment are difficult to estimate in monetary terms. It is therefore not surprising that different figures have been used over the years to reflect the contribution of the forestry sector in Uganda to GDP. The Ministry of Finance has been estimating it to be about 2% for the last 10 years while the Forest Department put is at about 6%. These figures exclude the environmental services, which have not been quantified. The actual percentage contribution of the forest sector and other primary sectors to GDP is expected to decrease as that of other sectors increases. This is in line with economic development in the country.

1.3.5 Environmental Services

Probably the greatest contribution of the forest sector to the economy of Uganda is the environmental services it provides in terms of climate regulation, soil conservation, and protection of biodiversity and carbon sequestration. Unfortunately, these services are not quantified. The forests of Mt Elgon, Rwenzori, Bwindi and Mgahinga have substantial values as watershed areas and reservoirs for unique biodiversity.

The exploitation of the environmental services of forestry is to be enhanced by the active promotion of farm forestry as proposed in the Plan for Modernisation of Agriculture (PMA). Farm forestry is to be used, as the means for improving soil productivity and for it's multiple socio-economic benefits in almost all the farming systems in the country. Agriculture, as already, mentioned is the backbone of Uganda's economy.

1.3.6 Social Functions of Forestry in Uganda

The forestry sector plays a significant role in the lives of Ugandans in the following areas:

- Employment: The forestry sector offers significant employment. Rough estimates put the current annual turnover of business in forestry at close to Ush 297 billion with the non-monetary value accounting for 30% of this.
- Raw materials for Construction and Furniture Making and Energy: The forestry sector provides energy and raw materials for the construction and furniture making industries. Over 90% of the national energy demand is from firewood and charcoal. While about 400,000 cubic meters per year is used in the construction industry and for furniture making (Claus-Michael, 2000).
- Food Security, Cultural and Spiritual Values: The rural population in Uganda depends on forests for food security, agricultural productivity and cultural and spiritual values that depend on trees and environmental services from trees. Forests are a major source of medicinal plants, which are mostly used by the rural population (about 90%).

1.3.7 Institutional set up of the Forestry Sector.

Management of the Forest Resource

The constitution of Uganda (1995) vests the responsibility for managing Uganda's gazetted forest resources in the government but at different levels and in different agencies. The key agencies are Forest Department, Uganda Wild life Authority and local government (District Councils). All other partners support, collaborate and complement the efforts of the government in providing financial

and technical support, human resource development or training materials and publicity. The role of each agency has been elaborated upon in Chapter 5.

Forestry Research

The key agency for forestry research is the National Agricultural Organization (NARO) through the Forest Research Institute (FORI). Other government departments that are involved in forest research are the Forest Department (FD), Uganda Wildlife Authority (UWA) and the Universities of Makerere and Mbarara. A number of NGOs are also involved such as ICRAF.

National Economic Planning

The Ministry of Finance, Planning and Economic Development is responsible for the overall economic planning of the country and therefore has a direct role in ensuring that forest matters are included in the national planning and allocation of resources. It also coordinates all external financial input to any planning or implementation of forest related activities, which is meant to assist in the government.

2 FACTORS LIKELY TO INFLUENCE FORESTRY IN UGANDA DURING THE NEXT TWO DECADES

2.1 Factors External to Forests and Forestry

The most important external factors influencing the forestry sector in Uganda today are population growth and economic growth. These two factors directly or indirectly influence important trends such as the energy consumption patterns, agricultural productivity and the growth of other sectors in the economy which in turn have an impact on the demand and supply of forest products and services. Below is a description of the most important external trends likely to influence the forestry sector in Uganda today.

2.1.1 The Impact of Population Growth on the Forestry Sector

POPULATION FACTS	
Current Population [(1)]	21,466,000 people increasing at a rate of 2.9%
Structure	47% below 15 years
Average density	90 persons per km^2
Projected Population in 2020	37 million
Life expectancy	45 years
Threats to the population	AIDS but this has now been reduced to less than 10% Ebola epidemic – still a new phenomena.
Factors influencing settlement patterns	Land productivity, climate, landforms, vegetation and water supply
Urban population	15% but increasing at a rate of 6.4% annually
Rural population	85% but increasing at a rate of 2.4%
Most densely populated areas	Lake Victoria crescent, fragile highlands in South west and east of the country
Impact on forest cover and demand for forest products	❖ Migration of landless people from the densely populated highlands to the lake Victoria crescent forests and other forests to engage in charcoal production and pit sawing for charcoal and timber to sell in urban centres has accelerated deforestation ❖ Agricultural expansion into forest land. ❖ Deforestation by refugees of forests near their camps ❖ Rapid rate of urbanization is increasing the demand for charcoal and timber for construction and furniture. ❖ Demand for charcoal is increasing at a rate of 6% similar to the rate of urbanization. ❖ The construction industry is growing at a rapid rate of 10 to 20%.
Measure taken to curb deforestation	❖ Increased protection of government owned forests. Uganda Wildlife Authority now manages 44% of the THF. ❖ Collaborative forest management is being tried out in some few cases. ❖ Agricultural intensification is being promoted in densely populated fragile highlands by NGOs. The PMA will also promote this. ❖ Ministry of Energy is advancing promotion of alternative sources of energy.

The rapid population growth in Uganda has led to increased deforestation in peri-urban areas and the densely populated fragile highlands in the east and south west. The increase in urban population corresponds to the increase in the demand for charcoal of 6% per annum. This has serious implications on deforestation. Charcoal production accelerates deforestation because unlike firewood, which is mostly got from dead branches and stems in rural areas, charcoal production involves the felling of live trees. Charcoal production is also highly inefficient due to wasteful

[1]NEMA (1998)

technologies currently in use. The rate of urbanization is faster than that of population growth and unless something is done to provide cheaper fuels to the urban population, deforestation is expected to increase at a similar rate if charcoal remains the dominant fuel for the urban dwellers. The consumption of sawn timber and poles are also increasing with urbanization. Most of the private forests are located in the less densely populated areas around Lake Victoria and the islands. These are also near to the biggest urban centers in Uganda and are a source of construction materials as well as charcoal. These forests are the most threatened in the country. Agricultural expansion into forestland has been discussed in detail under developments in agriculture.

2.1.2 The Impact of Economic Growth and its Related Effects on the Forestry Sector in Uganda

For the past 10 years GDP growth in Uganda has exceeded population growth indicating a slight improvement of per capita income in real GDP terms. Since the late 1980s and early 1990s poverty levels have been declining largely due to increased economic growth. There is better distribution of wealth in the rural areas as opposed to the urban centres. On the whole, analysts have revealed that an annual decline of 2.5% in absolute poverty was registered in the country between 1992 and 1996 (NEMA, 1999). Uganda is in its early stages of development and as such the rapid economic growth will inevitably impact on the forestry sector for at least the next 20 years. It has accelerated urbanization and with it the demand for charcoal as already discussed. It has led to the growth of building construction and therefore increased the demand for timber and poles for furniture and construction. Economic growth however is also expected to have positive impacts in the long run. It is expected that it will lead to a shift to use of alternative sources of energy, alternative construction materials and furniture other than those from wood, agricultural intensification, increased ecotourism and the development of other sectors in the economy which should reduce the population's dependency on land. Some of these tends are already evident and are in government plans such as the Poverty eradication action plan (PEAP) and the Plan for the Modernisation of Agriculture (PAM). Some important trends about Uganda's economy and developments in other sectors likely to influence the forestry sector are outlined as below:

Relevant Facts on Uganda's Economic Growth
❖ Average GDP rate for the last 10 years has been 6.5% per year. ❖ Average percentage increase of per capita GDP over the last 10 years has been about 3.3%
❖ PEAP [1] to decrease percentage of population living in relative poverty from the current 85% to less than 30% in 2020.
❖ PMA [2] targets to increase per capita income to US$ 500 per year and rate of GDP growth to 7.5% per year at farm level.
Developments in the Agricultural Sector
❖ About 200,000 [3] hectares of land are cleared annually for agriculture and grazing.
❖ Agriculture employs 86.6% of the population in Uganda, contributes about 40% to GDP and generates 90% of foreign exchange earnings.
❖ PMA estimates that area under crop production will increase from 5,300 thousand hectares in 1996 to 6,925 thousand hectares by 2002 – an increase of 30.7%. This may lead to increased deforestation unless an appropriate land use policy is in place.
❖ PMA will promote farm forestry.
Developments in other Sectors
❖ The share of the manufacturing sector in the total GDP has been increasing steadily from 8.4% in 1996/97 to 9.1% in 1997/98. The average annual percentage increase is 15.9% (NEMA, 1998).
❖ Much of the industrial growth has been in agro processing.
❖ The mining sector has grown by 48.2% from 1996 to 1997 as a result of private sector investment.
❖ The construction industry is growing rapidly at a rate of 15 to 20%. This is expected to continue for the next 20 years.

1 Poverty eradication action plan
2 Plan for Modernization of agriculture
3 Estimated by Ministry of Agriculture in 1994

❖ Uganda's main road network covers about 25,757km of which 49% is dry weather, 41% all weather and 9% tarmac. About 90% of the road become impassable during the rainy season. This has a negative impact on the growth of other sectors but has made it difficult to commercially exploit certain forests hence decreasing the rate of deforestation.
❖ Government road sector development program emphasizes road maintenance and rehabilitation of rural feeder roads.
❖ Telecommunications has been liberalized and several private companies have emerged to provide mobile telephone networks which now span all over the country.
❖ The print and electronic media are largely owned by the private sector and reach out to all sectors of the population in many languages. There has been a considerable increase in the number of newspapers, FM radio stations and television channels in the last few years. This is a positive trend and it is expected to help exchange of information, improve access to technologies and strengthen interaction.
Dependence on Biomass Energy Use
❖ Biomass energy accounts for about 96% of the countries energy consumption. It is used mainly in form of firewood. Total woody biomass production for charcoal, commercial firewood and collected wood fuel has been conservatively estimated at about 28.6 million cubic meters solid. This almost matches the demand, however woody biomass demand (rural and urban) is increasing at a rate of over 3% per annum. [(1)]
❖ Wood fuel is used in households and small-scale industries such as in the production of lime, processing of fish, agro processing and brick making.
❖ Firewood consumption in rural areas is estimated at 600 to 900 tons of air-dry biomass per capita per year.
❖ In urban areas, the average per capita charcoal consumption was estimated at 150Kg per year (Forest Department, 1992)
❖ Some areas in Uganda have a surplus of biomass energy while others have a deficit. The overall picture is that Uganda has a surplus of biomass energy.
❖ Woody biomass demand is increasing by over 3% per annum. Nearly 3.5 million tones of wood is commercially sold for fuel annually. Studies show that over one third of that amount (over 1.3 million tones is consumed in the industrial sector (tea, fish, lime). [(4)]
❖ Charcoal consumption is increasing at a rate of 6% per annum. In 1994, about 400,000 tones of charcoal was produced and marketed in Uganda. Urban household use accounted for about 70% of that demand while commercial establishments such as hotels accounted for 25%.

The PEAP strategic objective on forests is to enhance sustainable natural resource management and biodiversity conservation, raise public awareness and ensure access to least cost energy sources. Afforestation and reforestation programs through large scale and household programs, private and public peri-urban tree planting are some of the priority actions to be undertaken by the year 2020. If this plan is adhered to, the demand for forest products will not have adverse effects on the environment.

2.1.3 Changes in relative role of different sectors

Uganda's economy mostly relies on the primary sector, especially agriculture. *Appendix 3* shows the structure of the national economy and the major sector contributions comparing 1992 and 1997. It has been the policy of government to address this imbalance by favouring development in the industrial and services sectors. The services sector has been largely stagnant for some time but growth in the manufacturing, construction, transport and hotel sectors have registered significant growth. However, agriculture is being promoted as the vehicle for poverty eradication in Uganda and will therefore continue to dominate Uganda's economy in the next 20 years. Agriculture expansion is expected to have adverse impacts of forestry if this is not combined with proper land use planning to guarantee control of deforestation, soil erosion, loss of biodiversity it will not be sustainable.

2.1.4 Impact of Modernisation of Agriculture of Forests

Modernisation of agriculture may put more pressure on land resources as large tracks of land are opened for cropping. There is a misconceived idea that Uganda has 16.7 million hectares of arable

1 ESD 1995

land and only 32% of this is under cultivation. Most of this so-called arable land is under forests, swamps and woodlands, which are also very necessary for our well being. The expansion into new areas may spell deforestation, loss of biodiversity, increased use of agro-chemicals and possible pollution of surface and ground water. The modernization of agriculture in Uganda could lead to loss of our natural forests and the associated biodiversity, on private land while increasing the number of planted trees on farms. This can be avoided if it emphasizes agricultural intensification as opposed to expansion and the promotion of farm forestry. Trees as an agricultural commodity have offered farmers an economic alternative of using marginal land and have relieved the natural vegetation of pressure. They can provide a means of rehabilitating degraded land and raw materials for small-scale industries in rural areas.

2.1.5 Developments in the Industrial and Services Sectors

Though dependency on agriculture is still heavy, its contribution to GDP is slowly declining while that of manufacturing is increasing. The growth in the manufacturing sector has been boosted by increased foreign investment to the tune of USD 834 million and joint ventures to the tune of USD 507 million in the fiscal 1997/98 (NEMA, 1999).

There is still lack of competitiveness in the manufacturing sector with regard to international and regional markets. Industrial growth is still too low to absorb the labour force sufficiently to significantly reduce pressure on the forest resource. Some industries like tobacco, tea, lime production and fish processing depend heavily on trees for fuel though efforts have been made by some of these industries such as Rwenzori Highland Tea Co. and British American Tobacco to plant trees to meet their own needs. Increase in activities of such industries could lead to increased tree planting if well guided. Uganda has comparative advantage in agro-processing, tourism and mining industries and these are expected to dominate in the year 2020.

The rapid rate of building construction is due to the fact that the building boom comes after nearly two decades of very little construction. There is therefore a large backlog in this field as well as an acute shortage of housing in many towns for example, in 1996, only about 8% of Ugandans lived in permanent structures (UNIDO, 1997). There is a near three-fold increase in construction from 1985/86 to 1994/95.

It is expected that rapid growth will continue up to 2020 and the demand for forest products is expected to grow almost as fast as the industry itself. Much of the timber is from tropical high forests though market for timber from coniferous plantations has been increasing. The furniture industry is closely linked to economic growth and disposable incomes and is highly dependent upon the availability of sawn timber and cane products from the country's forests. Natural forests provide the prized hard wood for this industry and for construction. Due to increased protection of Uganda's natural forests, today a good amount of hard wood is smuggled from neighbouring D.R. Congo. It is expected that natural forests on private land will be exploited excessively to serve the growing construction and furniture industry. Unless commercial tree planting is done on a large scale and non-wood substitutes are adopted for energy and construction, it is estimated that within 20 years Uganda will actually be importing timber.

Under the Forest Resource Management and Conservation Program (FRM&CP), mechanisms will be developed to involve the private sector in ecotourism initiatives and joint ventures with the communities. Some factors that have hindered the development of ecotourism in Uganda include poor accessibility to some tourist sites, poor hotel facilities in most areas, insecurity and poor publicity. Other constraints are the high cost of fuel as compared to neighbouring countries, high

electricity, telephone and water tariffs which make tours to Uganda prohibitive. For example, Ugandans find it cheaper to go for holidays to say Whitesands Hotel in Mombasa in Kenya than to Mweya Safari Lodge in Queen Elizabeth National Park.

2.1.6 Energy Use

Causes for Increased Biomass Demand: The increasing demand for biomass energy over the years is due to increase in national human population and an increased influx of refugees. There has also been a lack of affordable alternatives. Wood fuels are obtained from bush land (30%), woodland (20), arable agricultural land and fallow land (48%) and natural forests 2% (UNDP/ESMAP, 1996).

Charcoal Production and Its Impact on Forests: Charcoal is mostly used in the urban areas. Most charcoal is produced from private land and the implications are that increasing urbanization will lead to increased deforestation.

Potential for Substitutions

The government has stepped up efforts to make alternative sources of energy available to Ugandans. There is considerable effort to increase use of electricity. Currently about 5% of the population uses electricity. With increased industrial activities in the country, the demand for energy is expected to increase.

Assuming an annual GDP growth rate of 6%, demand for electricity and petroleum is projected to increase at around 6-7% per year (ESD, 1996). To date, the increased demand in the industrial sector of 14% has not yet been matched by increased production in electricity. So far the commissioning of the second power plant of 200mW capacity has already been done and this has increased on electricity production. The National Biomass Study of the Forest Department estimates that Uganda's hydroelectric power will still account for only 5% of total energy consumption by the year 2015 even with the planned increase in production and reduction in tariffs.

The consumption of biomass energy is expected to increase with population at a similar rate of 2.5%. The use of alternative energy sources (wind, solar, geothermal and biogas) is expected to increase in response to the rising demand. Exploitation and development of renewable energy sources could contribute to environmental conservation and change the status of rural Uganda by improving the quality of life. The Chinese Government has committed about $ 170,000 for the construction of 20 demonstration biogas digesters and training of Ugandans in the design construction and maintenance. The Indian Government has also expressed interest in biogas development in Uganda. There has been an effort to increase the use of solar energy by the government but most Ugandans still cannot afford the technology. Uganda has a high level of solar insolation and sunshine all year around. The potential for harvesting solar energy is therefore great (NEMA, 1999). There is also potential for biogas production especially for those households that rear cattle.

Potential for Improvement of Efficiency

It has been estimated that over 17,000 tones of charcoal per annum can be saved if only 15% of urban households use improved, well-made, energy-efficient charcoal stoves with end use efficiencies of 30% (ESD, 1996). There has to be work on training, stove quality control, promotion and monitoring in order for these benefits to be achieved. There has been effort to increase efficient use of biomass energy by improving rural energy cook stoves, lime production and rural traditional

charcoal production through training and construction of demonstration kilns for lime and charcoal production. The Netherlands Government is supporting this effort through the Ministry of Energy.
Uganda needs to ensure that all trees felled are utilized as fully as possible. At the moment there is much wastage of the forest resource base in wood based industries due to inefficiency of machinery. The conversion of both indigenous and plantation timber is generally inefficient (about 25% when 50% to 60% is possible).

2.1.7 Expected Impacts of Development of the Transport Sector on Forestry

The development in transport and telecommunications is expected to have a positive impact on the forestry sector. It will be easier and faster to access information, which should lead to better management of the forest resource. It will also be easier to access the forests hence enabling better management. This will also encourage tourism, which should in turn generate an income for the management of gazetted forest reserves. The unprotected forests on private land may however be more heavily exploited as their accessibility is increased.

2.1.8 Economic Liberalization

Effect on the availability of Products and Services

Uganda has pursued policies aimed at promoting the growth of a market-based economy with less central government involvement. The key for accelerated economic development is believed to be decentralization and private sector development. The promotion of market-based development was introduced when market failures were still prevalent in the economy. Ownership of property, particularly land was not streamlined when the development strategy was adopted. This is particularly important, bearing in mind that Uganda's economy is heavily dependent on natural resources. The over exploitation of natural resources for economic gain was partly due to lack of/or inadequate environmental policies and regulations to guide the use of the environment and natural resources when the strategy was adopted. It is believed that unregulated production and consumption activities are likely to have negative impacts on the environment, making sustainable development difficult to achieve in the process (NEMA, 1998).

Effect of Globalisation on Local Industries and Employment

Economic liberalization is associated with increased industrialization, increased GDP and more employment opportunities. To some extent this has been realized. A few industries have been established in Uganda but these face stiff competition with foreign industries, which produce cheaper and better quality products. While Uganda has provided a market for foreign products, the country has not benefited much from markets abroad. The export base continues to decrease while the imports increase hence making the local currency weaker as compared to the US dollar. As percentage of GDP, total export of goods and services declined 25.9% from 1996 to 1998.

Development of the Forestry Sector in View of Economic Liberalization

Uganda has a favourable climate for forestry. This can be exploited to produce timber for export to neighbouring countries (currently, timber exports are banned). To the south is the heavily populated Rwanda, to the North is mostly desert-like Sudan, and to the East is Kenya that has lost most of her forest cover. The forests in Tanzania are mostly in the South and currently geared towards export markets of South Africa. Uganda is however disadvantaged as far as international trade is concerned. The bulk of wood and non-timber products are exported in semi-processed forms, denying it opportunity for job creation and profit from value added products. Uganda's capacity for investment in industries capable of manufacturing competitive and quality goods remains weak.

Uganda needs to develop ecotourism as it has comparative advantage in this as well as agricultural production.

2.2 Internal Factors

The following is an account of trends within the forestry sector likely to have an impact on the future of forestry in Uganda.

2.2.1 Policy and Institutional Changes

Changes in Ownership and Management of Forests

Government is restructuring the forest sector. It will adopt a sectoral approach and hence consolidate the forestry mandate. The forest department will be transformed into a semi autonomous agency, which will clearly separate the production and normative roles of government. Planned government policy is to devolve and privatise production activities in forestry. The local communities and the private sector will play a more prominent role in the development of forestry in future. Administrative levels that are closer to households, preferably the local councils will implement farm forestry in particular according to the PMA. The proposed Forestry Policy and Forestry Act seeks to extend the forestry frontier beyond the narrow forest reserves confines into people's households. Stakeholder participation, holistic approaches in addressing farmers needs, partnership and cooperation of all stakeholders and sustainability and protection of the environment are fast gaining importance in forestry in Uganda. They are expected to provide an interface for linkage between modern forestry and modernization of agriculture (MFPED, 1999). Pilot projects on collaborative forest management and ecotourism are currently under way in the Forest Department. Some of the negative impacts of this new institutional set up have been discussed in Chapter 5 under accomplishing the vision

2.2.2 Impact of Global Initiatives on National Efforts to Develop Forestry and Protect the Environment

Uganda is signatory to many international agreements and conventions concerning the forest sector. Below is an account of the country actions towards implementation of some global initiatives.

The Kyoto Protocol

One of the mechanisms for mitigation of climate change spelt out by the Kyoto Protocol and relevant to developing countries is the Clean Development Mechanism (CDM). The CDM permits developed countries to buy emission reduction units from developing countries in order to meet industrial emission commitments. The CDM intends to assist countries in implementing sustainable development and in obtaining funds to carry out project activities resulting in certified emission reductions of GHG. Carbon emission reductions can be banked or sold by the respective developing countries from the year 2000. Reduction in emissions will only be certified if they are additional to any that would occur in absence of the project activity.

Action Towards Implementation of CDM in Uganda: The Meteorological Department in Uganda is the focal point for developing guidelines for the implementation of the CDM. It has put in place a 2-year project to kick-start the CDM process and encourages actual CDM investments within acceptable national and international frameworks. Task forces have been established in the Forest Department, Energy Department, and Transport sector and will also involve socio economists. The task forces are to develop criteria for screening CDM projects. Such projects should be within national development plans, be sustainable, attractive for investment and should not encourage environmental degradation.

The Issue of Funding Forestry Projects through CDM: The EU/UK does not see carbon sequestration through the forestry sector as eligible under phase 1 i.e. 2000-2012. It is therefore possible that this initiative may not have a significant impact on the forestry sector in Uganda by 2020. The development of ecotourism, horticulture and agro forestry are some of the areas that are being fronted by the forestry task force in Uganda as relevant to the CDM. Mere tree planting is regarded as inadequate as the trees may be cut down and burnt hence releasing carbon dioxide in the atmosphere.

The IPF and IFF Processes

The UN ad hoc Inter-governmental panel on Forests (IPF) and the Inter-governmental Forum on Forests (IFF) has been assessed by Uganda through a national consultative process to investigate their relevance to our situation and to work out strategies on how they can be incorporated in our national forest program. Their value in relation to national priorities has also been assessed and proposals for integration into national programs made. The National Forest Program has specifically been identified as the vehicle for the implementation of the IPF proposal. The IPF Program Element II covers financial assistance, technology transfer, capacity building and information. This element could be used to attract foreign investment in the forestry sector in Uganda.

Convention on the Protection of Biodiversity

The Convention on Biological Diversity confers upon the country the sovereignty over her genetic resources and stipulates that access to the resources must be on mutually agreed terms, negotiated on the basis of prior informed consent. The government of Uganda is aware that access to genetic resources in Uganda's forests has been largely unregulated, with an inadequate framework for granting prior consent and certainly no mechanism for fair and equitable sharing of benefits. There is therefore need to improve the regulatory framework governing the access to the genetic resources in Uganda's forests. Efforts are in progress to address these issues and to allow access to these resources for economic development. There is a growing realization that the conservation of biodiversity has to be justified in economic terms otherwise it will not survive the pressure from the growing population.

Actions on the Convention on the Protection of Biodiversity: Uganda commissioned a study to evaluate the implications of ratifying the convention on biological diversity in 1996. The study recommended that policies to do with biological diversity should be changed to incorporate the provisions of the convention. It also recommended a review of the legislation on intellectual property rights in relation to biological diversity conservation and utilization to modernize protection of intellectual property in the context of emerging international trends. Various studies were made aimed at legislative reform in various bio-diversity related fields such as forestry, wildlife and national parks, fisheries and wetlands. Apart from this various policies, programs and plans have been created and approved by government these include:

- The National Environment Management Authority policy,
- The Wetlands policy and the wildlife and National parks policy,
- The Forest policy is still awaiting approval.

With enabling policies and legislature in place, it is expected that the perception of policy makers, civil society and people as regards these initiatives will be improved. The National Environment Management Authority (NEMA) has been contracted to produce a national biodiversity strategy and action plan. This will hopefully address the integration of biodiversity and traditional knowledge in various land uses.

2.2.3 Investment in the Forestry Sector

Past Investments in Forestry

There was a well-developed forest industry in Uganda in the early 1970s, mainly based on harvesting in tropical high forests, and owned by Asians. It included sawmills, a particleboard factory, a plywood line, a match factory and a number of treatment plants and drying kilns. Saw mill output was about 86,000 cubic meters in 1970. There was a severe decline over nearly two decades due to nationalization, civil war, and the expulsion of Asians, lack of spare parts and lack of skills. In 1995, the output was estimated at only about 12,000 cubic meters per year.

Current Investments in Forestry

This shortfall has been compensated by a large increase in the activity of pit sawyers who now have a share of 90% of the domestic market. It was estimated in 1995 that about 3,000 pitsawyers were operating. This development has led to poor utilization of the forest resource. Pit sawyers only saw that part of the tree, which is convenient for them converting about only 25 to 30 % of the tree. They are wasteful in their conversion and they select only the best species leaving the rest to waste. Because of their cheap production costs and frequent avoidance of royalty payment and sales tax, pit sawyers are able to sell valuable timbers at such low prices that investments and production in sawmilling is discouraged. This trend is being reversed as royalties have been increased and a number of mobile saw mills are now operating in forest plantations and natural forests. They are also producing at low capacity due to lack of skills and poor integration of the harvesting and the conversion activities as well as lack of saw doctoring/equipment and difficulties in provision of spare parts. In 1995, the total installed capacity was at 67,000 cubic meters (sawn) shared equally between hardwoods and soft woods. This indicated a capacity of less than 20% (Forest Department, 1995). The Norwegian Government is assisting Uganda to address some of these issues through the Combined Forestry Training Project.

Future Investments in Forestry

Since the liberalization of the market in Uganda, private sector projects in the forest sector have increased. According to Uganda Investment Authority, in 1999 a total of 90 projects mainly in wood and wood processing were assessed. However only four projects were concerned with forest management. The planned forest investment in 1999 amounted to nearly US$ 80 millions and an employment of more than 4,500 jobs. With a calculated rate of return of about 5% for Eucalyptus plantations, it is not likely that there will be much investment in forestry by the private sector though Uganda has a favourable climate for forestry (Falkenberg et al, 2000).

Large-scale sustainable private sector investment in forestry will largely depend on the availability of affordable funding for forestry projects and security of land tenure among other factors already mentioned. Future investments in forestry in Uganda seem to favour foreign investors more than Ugandans. This is because foreign investors have easy access to credit schemes, soft loans, subsidies, insurances and guarantees that local investors do not have. In Uganda, the main financial institutions that support the private sector are development banks and commercial banks. Loans to the private sector have mainly gone to wood processing enterprises, with practically none into forest management or afforestation projects. There has been an interest by EU to fund private sector tree planting initiatives. The Uganda Forest Department is in the process of developing guidelines on how this is to be done. This initiative is in realization of the fact that protection of natural forests needs to be followed by tree planting activities in order to be sustainable. The project is expected to start in the year 2001.

Constraints to Private Sector Participation

Private sector participation is hampered by:

- Lack of skills,
- Inadequate tree and land tenure arrangements,
- Poor quality of seed and planting stock for plantation forestry,
- Market disincentives for investment and re-investment of profit,
- Lack of appropriate information,
- Unrealistic pricing system that undervalues timber as used until the recent past,
- Lack of transparency in offering of land permits,
- Unclear conditions to replant trees in plantations,
- In some cases, government and non-governmental subsidies have distorted the market forces of demand and supply making it unprofitable.

2.2.4 Technological Advancements, Transfer and change of Focus

Research Efforts in Forestry at the National, Regional and Global Levels

Forestry research in Uganda was originally focused on forest conservation and management and was instrumental in bringing about the maintenance of the forest resource and increased productivity. Today, the lead agency for forestry research, the Forest Research Institute (FORI) under National Agricultural Research Organization (NARO) in the Ministry of Agriculture conducts research geared towards addressing national agricultural policy objectives of poverty eradication and sustainable development through agricultural modernization. Its future plans are to increase research into collaborative forest management with local communities, and to develop non-timber products among other issues.

Future plans for the development of plantation forests includes the development of indigenous tree species for forest plantations. There are indications that developments in the field of biotechnology elsewhere are being transferred to Uganda by the private sector. One company is already in the business of promoting fast growing eucalyptus species for electricity production. The Ministry of Energy is also using technological advancements in energy conservation from other parts of the world to improve efficiency of charcoal and lime kilns as well as cook stoves.

3 THE FORESTRY SECTOR IN 2020

The aim of this out look study is not to predict the future but to develop future scenarios of the forestry sector in Uganda based on the analysis of the driving forces and trends to the year 2020. In Uganda increasing pressures on the forest resources is evident, however, there are efforts by government through policy reform and institutional changes to reverse this trend. The outlook of the forestry sector in 2020 will therefore largely depend on whether or not these efforts by government and non-governmental organizations are well implemented to have a positive impact. Due to the fact that there is inadequate data on forestry, it has not been possible to come out with quantitative analysis of the sector in 2020. The following is an overview of the forestry sector in 2020.

3.1 State of the Natural State Owned Forest Estate & Conservation of Biodiversity

- Currently this is only 30% of the forestland in Uganda or about 1.5 million hectares or 7% of the total land area. With deforestation estimated at 1% per annum, this area may be reduced to about 1.2 million hectares in 2020. Since protection of these forests has been increased it is not likely that deforestation will be more than this. It has already been estimated that encroachment has been reduced to less than 2% per annum (NEMA, 1998).
- State owned natural forests will be better managed and stoked.
- The contribution of state owned natural forests to wood production will decrease while their contribution to ecotourism and services will increase. This is because the emphasis is now on protection of biodiversity rather than on the productive functions as was originally the case.

Influencing factors: Increased protection through policy and institutional changes. Global initiatives that support biodiversity conservation, the growth of ecotourism, improved conflict management by NGOs.

3.2 State of the Natural Forests on Private Land

- Currently this is about 70% of the forestland in the country or about 3.5 million hectares or 17% of the total land area. This is where most of the deforestation will take place. The demand for timber has been accelerating at a rate of 1% higher than the population growth (2.9%)[(1)] that is at about 4% if this is interpreted to reflect the rate of deforestation, then in 2020 the natural private forest will be reduced to less than 700,000 hectares. This scenario could be worse since the figure does not take into account the rate of forestland conversion into agricultural land and the increased demand for biomass fuels.
- The above scenario is assuming that the proposed forest policy, the PEAP, the PAM and other related policies and plans are NOT properly implemented. It also assumes that a favourable land policy is not in place as is currently the situation.

Influencing factors: rapid population growth, rapid urbanization, rapid growth of building construction, accelerating demand for timber, wood fuel and agricultural land, lack of favourable land policy. Lack of wood substitutes.

1Claus Michael Falkenberg et al (2000)

3.3 State of Plantation Forests

- Currently forest plantations only cover 0.2% of all forest land in the country or about 34,000 hectares. About 65% of this is government owned while the rest is privately or customarily owned.
- Most of the state owned plantations are in a very poor state. There has been little planting. Within the next 5 to 10 years all the existing stock will have been exhausted.
- The area under forest plantations may increase if the proposed privatisation of forest plantations is encouraged with appropriate incentives.
- There will be a large deficit of saw logs as most trees if planted at all will still be very young. Industrial planting was last done in some cases as far back as 1975.

Influencing factors: lack of private sector involvement in establishment and management of forest plantations. Poor management of existing plantations. Lack of incentives for the private sector to invest in forestry. Abundance of trees outside forest reserves which will provide the bulk of timber and poles in the country.

Reversing the trend: The proposed forest policy seeks to promote productive forestry plantation businesses and urban forestry. If well implemented the trend could be reversed.

3.4 State of Trees Outside Forests

- Area under TOF is expected to increase. From 1989 to 1998 it increased from 23% to 28% (Kaboggoza et al, 1998). Farm forestry is traditionally practiced in some areas. PAM is also to actively promote it. NGO have been focusing on on-farm tree planting for the last decade.
- Increased contribution of TOF to production of wood fuel and timber as well as services such as soil erosion control and rehabilitation of marginal lands.

Influencing factors: Policy and institutional changes such as the PMA. NGO efforts. Lack of accessibility to gazetted forest reserves. Increasing demand for forest products and services due to increasing population and economic growth.

3.5 State of Non Wood Forest Products

- In Uganda about 80% of the population depends on traditional plant medicines. There is no indication that this trend is to reverse. It is likely that this situation will remain for the next 20 years partly because it is difficult to change people's behaviour.
- Commercialisation of some NWFP will be more prominent in 2020. Some of the more promising NWFP are ecotourism, honey, mushrooms, shea butter, gums/resins, rattan, medicinal plants, wild foods and handcrafts.
- It is expected that with increasing economic growth some NWFP will be less in use in preference for modern alternatives. Most NWFP are associated with traditional use and poverty. Their use is at household level and therefore outside the established marketing system. This makes it difficult to record and plan for.

Influencing factors: The commercialisation of NWFP will be promoted by the uniqueness of their nature and the liberalization of trade.

3.6 State of Wood Demand and Supply Situation

- From 1988 to 1999, wood production increased by 1% faster than the population growth implying an over exploitation of certain forest areas (Claus-Michael Falkenberg et al, 2000).
- The production index for timber has steadily increased from 58 in 1990 to 600.5 in 1997. There is no possibility that the demand for forest products and services will be significantly reduced in the short to medium term.
- The rate of wood biomass demand is 3% per annum. The rate of charcoal demand is 6% per annum. While some districts have a biomass fuel surplus others have a deficit. Overall the picture is that Uganda has a surplus of biomass fuel. At this rapid rate of demand, by 2020 Uganda will have a deficit
- If the demand and supply equation was balanced in 1995 as estimated by ESD 1995 at 28.6 million cubic meters solid in 1995, then in the year 2020, the demand will be at more than 50 million cubic meters solid assuming a rate of 3% per annum.

Influencing factors: Population growth, rapid rate of urbanization, lack of affordable alternatives, lack of affordable improved stoves.

Table 1: Effect of Agricultural Expansion on Forest Vegetation Extrapolated to 2020

Forest Vegetation	Area 93/94 (ha)	Area 1998 (ha)	Area 2006 (ha)
Plantations	35,000		50,000
TROPICAL HIGH FORESTS (FULLY STOCKED)	650,000	603,870	500,000
TROPICAL HIGH FORESTS (DEGRADED)	275,000	280,000	220,000
Woodland	3,975,000		2,900,000

Source: Adopted from State of Environment Report 1996/98 (NEMA, 2000)

3.7 Important Trends Concerning Non Wood Forest Products (NWFP)

Data on NWFP in Uganda is scanty, however, it is a well-known fact that they play a big role in sustaining the well being of most rural people in Uganda. There are no statistics in Uganda showing the economic contribution of NWFP to GDP. It is expected that the commercialisation of NWFP will lead to the commercial planting or domestication of trees for the purpose of producing commercial NWFP such as shear butter, gum resins, honey, silk and rattan. In Uganda today, shea butter is gaining importance. The shea butter project in Northern Uganda sells shea butter to cosmetic industries in America at USD$ 60 per kilo. More markets are being sought. Rattan cane has been over exploited in forest reserves in Western Uganda because of increased demand. The harvesting of gum arabic was halted due to political insecurity in Northern Uganda. Other NWFP gaining in importance in Uganda are the production of honey and ecotourism. There is also a Natural Chemotherapeutics Research Lab that carries research in medicinal aspects of plants. The centre was established in 1963 and is fully equipped with the most basic sophisticated equipment used in the extraction of medicines from plants.

The greatest hindrance to the growth of NWFP is poor marketing. The ecotourism potential of Uganda is unmatched but largely unexploited. However, with increased political security and development of infrastructure, ecotourism may be an important source of revenue for the country in the next 20 years. Eco-tourism if well managed and marketed, could have high returns with little

strain on the environment. Herbal medicines are gaining importance worldwide and it is expected that our forests will in future be important sources for international markets. At the moment the extraction of herbal medicines for international markets has often led to destruction of certain plant species such as Prunus africans. By 2020, we may see increased management of forests for NWFP.

3.8 Important Trends Concerning Conservation of Biodiversity

This is expected to increase due to increased good will from the international community who are willing to fund their conservation due to their cross border environmental functions. The Uganda Environmental Conservation Trust (Ecotrust), a body established to seek funding for the protection of Uganda's environment, has started acquiring critical biomes for the purpose of protecting them from degradation and promotion of ecotourism. Some land surrounding the Rwenzori National Park has already been acquired with funding from World Wild Fund (WWF).

3.8.1 Management Of National Parks

National parks in Uganda are areas of national importance for nature and landscape conservation and natural heritage preservation. They are the strictest forms of protected areas. They are areas established to preserve natural or scenic resources while allowing research and controlled tourism. Activities such as livestock management, charcoal burning, collection of firewood and medicines and making of traditional handicrafts may be granted by UWA on a special permit.

3.8.2 National Parks in Uganda: Importance and Trends

Uganda's tourism evolves around its 10 national parks, 29 wildlife reserves, sanctuaries and communal wildlife areas covering some 56,000 km^2 and about 14,900 km^2 (Falkenberg et al, 2000). The tourism sector in Uganda is a main exchange earner, a revenue contributor, employment provider and precursor for investment. This sector has continued to register an average growth rate of more than 10% annually (1995-1997). This is higher than the global tourism growth rate. It is expected that in the year 2020, the area reserved for protection of nature and wild life will have increased. This is because there is likely hood that re-alignment of boundaries where encroachment has occurred will be carried out, especially in Mount Elgon and Queen Elizabeth National Parks. Furthermore all fishing villages in Queen Elizabeth Park will be formally designated as wild life sanctuaries under the wild life statute. There are plans to create new wild life reserves in East Madi, Kaiso-Tonya and Lipan. Collaborative management is proposed for these new wild life reserves. In line with this, areas that are no longer serving significant conservation functions or those heavily encroached will be excised from the existing protected areas (NEMA, 1999). NGO's such as CARE and IUCN promote productive and sustainable land use in buffer zones as well as sustainable exploitation of non-wood forest products from forests.

3.8.3 Important Trends Concerning the State of Wood Demand/Supply Situation

Data on wood production and consumption is unreliable and outdated, however the general picture is that the demand for wood products is on the increase in Uganda to cater for the growing population. Much of the production is on private land, however, the majority of sawn timber production is from the forest reserves. Increase in living standards will lead to increase in charcoal consumption and this trend is already evident. Wood for charcoal production is the biggest wood consumer in the formal market with a share of over 55% (Claus-Michael Falkenberg et al, 2000). Generally, the wood fuel demand is growing faster than the demand for any other fuel. The table below shows the development of industrial production index for saw milling and timber.

Table 2. Development of industrial production index for saw milling and timber.

	1990	1991	1992	1993	1994	1995	1996	1997
Index of industrial production	58	58.1	80.3	102.2	107.0	118.8	325.7	600.5

4 ASSESSMENT OF THE IMPLICATIONS

The overall picture in Uganda is that there will definitely be increased demand for forest products and services in the next twenty years. It is therefore expected that within the next 20 years, there will be more dependence on the forestry sector. This trend will have the following implications:

- More employment opportunities in the forestry sector as more people seek to exploit the increasing demand for biomass fuels and timber for construction. This trend may spark off increased establishment of woodlots and peri-urban plantations in densely populated and peri-urban centres. It is therefore expected that there will be increased contribution of the forestry sector to household incomes and hence greater contribution to GDP;
- The establishment of more forest plantations to exploit the current trends will lead to less dependence on agriculture for a livelihood by the rural population. This will lead to more agricultural intensification and increase the environmental contributions of forestry. Marginal lands will benefit from increased tree planting and agroforestry will be actively practiced for commercial gain. Tea and tobacco industries are already promoting tree planting by putting in place more effective forestry extension programs and encouraging and training farmers to plant trees to meet the energy demand in a sustainable manner. Farmers in densely populated areas also have woodlots on marginal lands;
- The potential of farm forestry to provide labour intensive off farm employment makes it a feasible investment given that shortage of land in Uganda is more of a perception than a reality. This reduces pressure on the land for cultivation and grazing activities;
- Trees will also be grown more for their multipurpose functions and their contribution to food security is likely to increase. Fruit trees will be more prominently propagated. PMA will also promote this trend;
- As the debate on climate mitigation gains momentum, there is a likely hood that tree planting will gain prominence for climate mitigation;
- The conservation of biodiversity and the promotion of ecotourism will be more prominent in Uganda and this will increase the forestry sector's contribution to GDP as it potential for bio prospecting and tourism are exploited.
- The commercialisation of some NWFP will provide a source of income to some rural communities;
- The functions of the Uganda wildlife Authority and the Forest Authority will be more clearly spelt out. They will focus more on facilitating the sustainable management of the forest resource while leaving the productive and management functions for the private sector and local communities;
- The private sector and local communities will be more involved in the management of the forest resource base than ever before. Collaborative forest management, joint forest management, privatisation of forest plantations are some of the ongoing trends that are likely to gain momentum and change the face of forestry in Uganda;
- Forestry research has already been integrated into agricultural research in Uganda. It is more demand driven and aims at serving the needs of PMA. The Forest Research Institute (FORI) is under the Ministry of Agriculture;

- Multi disciplinary research is now more prominent with participatory research methods more in use than the old traditional methods;
- Efforts are also under way to devolve some government functions in the forestry sector to sub-national levels of government. The government is committed to divestment of a number of central government departments among which is the forest department. Natural resource management, including some aspects of forestry is a decentralized service to district and sub-district levels. Agriculture, which is the natural home for farm forestry, has already been decentralized;
- The government is currently interested in the privatisation of industrial timber plantations and divesting farm forestry to more frontline agencies and levels that have a closer rapport with the peasant households. These will focus more on implementation through more collaborative and participatory mechanisms (MFPED, 1999).

5 ACCOMPLISHING THE VISION

5.1 Changes within the forestry sector

5.1.1 Policy and Institutional changes

Uganda is moving in the right direction as far as laying the foundation for the creation of a favourable forestry sector is concerned. The policy and institutional problems have been noted and pointed out to government by a forestry sector review mission. Plans are under way to address some of them and as a result the forestry sector in Uganda has undergone significant changes in its strategic direction in the recent past.

5.1.2 Accomplishing More Investment In The forestry Sector

In order to encourage more participation in forestry management by the private sector:

- There is a need to move away from over emphasizing the conservation and environmental functions of forestry at the expense of the productive functions. Under decentralization, forestry appears to have either been misconstrued as a service or else the capacity of the local authorities to handle the burden was overestimated. The fact that no revenue can be got from half of the permanent forest estate since this was created for the sole purpose of environmental conservation was certainly over looked (MFPED, 1999);
- There is need for technology and information transfer to the private sector regarding the profitability of investing in forestry and on the availability of funding mechanisms;
- There is a need to adopt a forest accounting system with a strong economic component. In the draft for the modernization of agriculture in Uganda, forestry is referred to as a low value crop. This is due to the fact that we do not have adequate data on the forest resource state, demand and supply situation and total monetary value of goods and services accruing. It is therefore very difficult to establish the real value of forestry to Uganda. This has led to gross underestimation of the contributions of forests to the economic development and well being of the country. In turn this has undermined the appreciation of the sector, which is now accorded a disproportionately low priority, especially in terms of fiscal allocations. The overall effect is that the value of trees as a renewable natural resource to be grown harvested and utilized for socio-economic development of the country is being clouded and overwhelmed by uninformed sentimentalism in favour of environmental protection and biodiversity;
- It is also essential that economic models for all major types of forest/plantations be developed and that a forest information system be put in place to provide reliable data for planning;
- In order to encourage more private sector investment in sustainable forest management, loans for such should have lower interest rates and longer grace periods than the normal industrial credits. Uganda should also investigate the potential of innovative financing mechanisms and incentives to help the private sector and make an effort to access international financing mechanisms for the forest sector and environmental conservation.

5.1.3 Technology changes

The issue of wastage of the forest resource base in wood based industries due to inefficient machinery will have to be addressed. Pit sawing is an effective method of sustainable utilization provided it is controlled properly. There is scope to assist pit sawyers with simple log handling technology and appropriate mobile band saw mills. In order to control wastage of our forest

resource base and improve the management of natural forests and plantations, there is need for more guidance and more strict enforcement to ensure:

- High quality sustainable management of natural forests based on good workable management plans;
- Minimizing unplanned extraction damage in natural forests;
- Increased enrichment planting;
- Leaving some plots within government timber plantations for research and seeds;
- Reforestation with fast growing commercially viable tree species.

Farm forestry is gaining importance in Uganda. The following technical interventions to promote farm forestry have been proposed in the following areas:

- Development of farm forestry extension packages for all farming systems in the country;
- Intensification of research into agricultural biodiversity and suitable farm forestry technologies and tree species for various agro ecological zones;
- Supporting the private sector to establish and manage tree nurseries for commercial purposes;
- Integrating agro forestry into school curricula;
- Building capacity of farmers and private sector in favour of farm forestry through training, retraining and information dissemination, developing training programs and field manuals for frontline extension agents and
- Identifying surveying demarcating and assessing natural forests on public and private land for technical management.

5.1.4 Human Development

The public has freedom to plant and manage their own trees but they are not adequately mobilized and have not internalised the value of trees. Today they are concerned more with the use of forest products and their interest in the management of the resources is still in its infancy. Forests and trees are taken for granted.

The promotion of farm forestry as stipulated in the PMA will require human resource development and a friendly extension service. Current government policy on devolution and privatisation emphasizes a localized, participatory and flexible approach to planning and institutional development with an implied sharper focus. There is limited financial and technical capacity at the district council levels for most of the devolved functions. There is need for capacity building at the sub district and lower levels. Existing agricultural extension staff needs to be reoriented towards farm forestry. Foresters also need to be recruited and retrained in extension methodologies.

According to the poverty eradication Action Plan (PEAP), government is to allocate more resources towards universal primary education, primary health care and modernization of agriculture. The plan aims at empowering the population through increased incomes and access to basic services and by building capacity. It is envisaged that with successful implementation of PEAP and annual economic growth rate of above 7.0%, mass poverty could be eradicated from society in the next 20 years. It is also envisaged that if sustained, in the next 20 years absolute poverty could be reduced to less than 10% and relative poverty to below 30%, while at the same time minimizing rural –urban disparities (NEMA, 1999).

Good governance is prerequisite for sustainable development. The government has the operation and independence of the judiciary. Constitutional order has been restored. Decentralization has been effected and allows local participation in planning and implementation of development projects.

Thee are also regular universal suffrage elections. In areas where there is still insurgency, however, economic activity remains disrupted and the displaced people have been causing environmental degradation and deforestation in refugee camps.

5.2 Changes outside the forestry sector

5.2.1 Changes in Policies of other Sectors

Several complimentary and enabling policies, laws and action plans have been formulated and these can be used to nurture forestry. The relevant acts and policies that impinge on the forestry sector include:

- The constitution of the Republic of Uganda (1995): Gives the state the responsibility of putting in place policies and legislation that can promote sustainable management of forests;
- The National Environment Statute (1995): Established NEMA that can issue guidelines concerning management of forest biodiversity in consultation with lead agencies;
- The Local Government Act (1997): Decentralized political powers to lower levels of government and accordingly puts the responsibility of management of forests under local governments;
- The Water Act 1999;
- Uganda Wetlands Policy 1995: establishes principles by which wetlands can be used and their productivity maintained sustainably. Some forests in Uganda are associated with wetlands (Sango-Bay);
- The Land Act (1998): The purpose of this is to provide for tenure, ownership and management of land;
- The Uganda Wild life Statute 1996: An enabling law for the implementation of the wildlife policy. It recognizes the need to conserve biodiversity and the participation of local communities in its management;
- The Agricultural Policy: Not yet formulated. It will have direct implications on clearance of forests for agriculture.

The above policies and legislative framework will encompass:

- Full consideration of poverty eradication in connection with all plans and actions;
- Creation and protection of bio-diversity resources;
- Sustainable management of forest resources regardless of ownership through the application of basic criteria and rules;
- Creation of additional forest resources through reforestation of degraded forest and other land identified as appropriate for the purpose;
- Support to an efficient and productive forest industry sector through fostering of conditions conducive to its flourishing;
- Decentralization to the lowest possible level consistent with wider criteria including national and international interest and making use of collaborative activities with local communities, groups and egos where appropriate. In 1997 forestry was decentralized but due to lack of plans, resources and personnel at district level, the forest resources were excessively exploited and the decision was reversed. As an interim measure, revenue sharing has been introduced with 40% of gross revenue directly credited to district budgets from where it is supposed to be allocated to lower levels;
- Full involvement of private sector in productive activities;
- Minimal involvement by government in any activity that could be carried out effectively by the private sector.

5.2.2 Areas for collaboration with other sectors

Government Sector Reforms

Significant government reforms are currently under way in almost all sectors to increase efficiency and economic growth. The government's reform processes are however very slow and difficult to implement. Sometimes implementation requires training and logistics and may entail a long process, which may stagnate the process. For example the minister for Water, Lands and Environment recently complained that implementing the land act entails a long process and the districts lack the capacity and facilitation. The land act was enacted in 1998 but up to now (2000); it has not been implemented (The New Vision July 12th 2000, page 6). The directorate of Water Development has issued a policy that promotes interaction between forests, climate and water resources. The National Wetlands Conservation and Management Program is working towards ensuring protection and wise use of wetlands.

Reforms in the Agriculture Sector

The PEAP and the PMA aim at sustainable natural resource management and conservation of biodiversity through environmental education, raising public awareness on public issues and building capacity in the districts. PMA will promote farm forestry. It should be noted however, that Uganda does not have a written agricultural policy, save for piecemeal statements occasionally made to parliament. This could be one of the reasons why in the past forest management has centred on permanent forest estate and not farm forestry (FF). Currently there are a number of other written policies with a direct bearing on agriculture and population. They are all disjoined and are not explicit on FF. The few agricultural laws that exist do have provisions, which could relate to the forest policy to nurture a symbiotic relationships for the benefit of farm forestry. There is a proposal to create a single and uniform category of forest reserves in order to open up the system and make it adequately responsive to innovation in forest/tree management in general and farm forestry in particular.

Reforms in the Energy Sector

Apparently there is an eclipse of the commanding importance of wood energy by electricity and petroleum in the Ministry of Energy. The fact that wood fuel provides over 90% of the energy consumed in the country has been ignored, to the detriment of development of the energy sector. Government policy on energy if any revolves around fossil fuels and hydroelectric power and yet these meet smaller proportion of the aggregate national energy demand. Policy decisions on these are taken oblivious of the radical and direct implications such are going to have on tree resources in the country.

Land Tenure Issues

The land tenure system in some parts of Uganda does not favour tree planting. Communally owned land tends to be deforested and there are no incentives for tree planting or retention for the individual. In most areas in Uganda, women carry the burden of crop cultivation though only 7% own land. Trees are long-term crops and women need security of land and tree tenure if they are to invest in them. The co-ownership of land by women and their husbands was supposed to address this issue in the Land Act. The issue has however been removed from the Land Act and pushed to the Domestic Relations Bill which has not yet been passed by Parliament. It is not debatable that natural resource use with an open access system for which no property rights are defined for individuals or communities risks degradation or depletion. This has been one of the factors that have led to deforestation on non-gazetted land.

Another issue of contention is that the Land Act 1998 could be a threat if people claim ownership of forest reserves they have occupied for more than 13 years. Private ownership of land could also lead to more fragmentation and hinder bigger blocks of land, which would otherwise have been developed for community forest plantations.

5.3 Who will do what

5.3.1 The Government

Central Government

The central government comprises of a number of bodies including the executive, parliament, security and law and order. The central government role is to ensure the security of person and property, the provision of a stable macroeconomic environment, basic infrastructure and social services (health care, education, safe drinking water) to the population. The central government has set policies, rules, regulations and institutional reforms to create an enabling environment in which the forestry sector can contribute meaningfully towards poverty eradication. There has also been increased protection of the permanent forest estate. There is however a big gap between policy formulation and implementation as already mentioned. There is need to:

- Build capacity for the private sector and civil society;
- Explore new funding mechanisms to support implementation;
- Facilitate technology transfer and information to the private sector;
- Coordinate and guide all donor efforts as well as all other activities taking place in the forestry sector;
- Consolidate all government departments with the forestry mandate under one ministry;
- Put in place incentives for the private sector to invest in forestry;
- Encourage activities that reduce pressure on the forest resource base such as rural industries, removing tariffs on non-wood fuels and intensification of agriculture.

Local Government

The role of central government in the forestry sector should be geared more towards regulation and quality control while local government takes up policy implementation and management. The decentralization process has given greater authority to local governments at the district and sub county levels to plan and implement programs. The production committees will especially be instrumental in implementing farm forestry. Local governments will therefore be responsible for designing government agricultural sector plans, delivery of extension services, entomological services, vermin control, land survey and administration, forestry and wetlands management and licensing and produce buying (MAAIF, 2000).

5.3.2 The Private Sector

The private sector should take over all productive functions of the forestry sector. This will create employment opportunities. The private sector should also participate in policy formulation and implementation of publicly funded programs. It should be involved in sector plans, contracting and direct provision of services on a commercial basis. The private sector should also explore opportunities in research and delivery of extension services. Joint ventures with local communities especially in the exploitation of non-wood forest products should also be investigated.

5.3.3 Civil Society

The civil society includes NGOs and CBOs as well as other organized bodies and associations. The civil society is already a key player in the design and management of the programs financed by the Poverty Action Fund (PAF). The civil society should be involved in the planning processes, implementation, financing and delivery of services to local communities. Public sector resources should be used in building the capacity of the civil society, facilitating their participation in public sector activities and in contracting them in the delivery of public sector services. Many pit sawyers are organized within associations. Properly supported groups of local people could grow timber trees on leased land inside forest reserves. Government should avail technical and financial support systems for such activities. Community based associations could also take up collaborative forest management and use.

5.3.4 Donor Agencies

Donor agencies are development partners in the eradication of poverty in Uganda. They include multilateral and bilateral organizations and agencies that support government and community organizations in the forestry sector through grants and soft loans. The term is also used to describe international NGOs. These agencies have been significant in providing development resources and they also dominate the process of policy formulation articulating sector support areas and determining the manner in which the resources are put to use. This form of ‘conditionalities, and technical supports can be used in guiding the direction of development of the forest sector. Donors need to harmonize their activities and speak with one voice to government. They should also harmonize their activities with government programs and evolve consensus on mechanism and procedures for financial disbursements and accountability that would apply in funding agreed upon programs at the centre and at local government levels. With increased transparency and accountability in the implementation of publicly funded programs, donors will be more committed to increase funding to government programs through budget support.

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