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**THE STATUS OF NON-TIMBER FOREST PRODUCTS
IN TANZANIA**

**BY FORESTRY AND BEEKEEPING DIVISION
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1 INTRODUCTION

1.1 Area and Vegetation

Tanzania covers an area of about 945,000 sq. km. of which the total land area is about 888,600 sq. km. According to the Hunting Technical Services (1999) survey, Tanzania is generally categorised by cover types into forest cover, woodland, bushland, grass land, open land, cultivated land and others (Table 1).

Table 1: Vegetation cover types of Tanzania

Cover type	Area (sq. km)	Proportion % age
Forest cover	27,231	2.88
Woodland	374,375	39.60
Bushland	173,163	18.32
Grassland	193,604	20.48
Open land	13,900	0.15
Cultivated land	101,435	10.73
Others	6,47	0.07
Total	890,163	92.22

Source: National Reconnaissance Level Land Use and Natural Resources Mapping Project 1997

On the other hand, Tanzania has an exceptionally rich and diverse indigenous flora and fauna (Mziray, 1999). This state has led it to be one of the 14-biodiversity hot spots in the world (URT, 1998). Due to this fact Tanzania has the potential to deliver many varieties of forest products like timber, non-timber, and non-wood.

1.2 NTFP & NWFPs

By definition, Non wood forest products (NWFPs) consist of goods of biological origin other than wood derived from forests, other wooded land and trees outside forest (FAO, 2000). On the other hand Non-timber forest products embraces all materials of a biological origin excepting timber which is being extracted on an industrial scale (FAO, 1993).

The non-timber forest products include wood fuel (fuel wood and charcoal) and other products that are not timber, like bamboo products, carvings, building poles etc. The non-wood forest products include essential oils, bees wax and honey, gum, tannins, latex, dyes, medicines, fibres, food (leaves, roots, fungi fruits), fodder and conservation functions.

The NTFPs are of important forest products of especially in the dry land areas where they form alternative sources of livelihood. They also contribute to poverty alleviation through generation of income providing food and improved nutrition, medicine and foreign exchange earnings (Chikamai *et al.*, 2000). Research done in six communities in Tanzania found that farmers were deriving up to 58% of their cash income from the sale of honey, charcoal, fuel wood, wild fruits and vegetables (CIFOR, 1999). On the other hand, the value of NTFP contribution to the existing low value of woodlands in Tanzania can have quite a substantial addition to the national economy (O’Kting’ati and Monela 1990)

1.3 Deforestation problems

According to FAO (2001), Tanzania loses approximately 92,000 ha or 0.2% of its forest land through deforestation. The main reasons for this deforestation are clearing for agriculture, overgrazing, wildfires, charcoal burning and over exploitation of wood resources (URT 1998). Due to the high rate of deforestation, low land productivity and poor land use (FAO 1985) the Government reformed some of its environmental policy objectives to conserve these resources. The objectives as per URT (1998) include:

- To ensure sustainable and equitable use of resources to meet the basic needs of the present and future generations without degrading the environment nor jeopardising neither health nor safety.
- To prevent and control degradation of land, water, vegetation and air which constitute our life support systems.
- To conserve and enhance our natural and man-made heritage, including the biological diversity of the unique ecosystems of Tanzania.
- To improve the condition and productivity of degraded areas including rural and urban settlements in order that all Tanzanians may live in safe, healthy, productive and aesthetically pleasing surroundings.
- To raise public awareness and understanding of the essential linkages between environment and development and to promote individual and community participation in environmental action.
- To promote international co-operation on the environment agenda and expand our participation and contribution to relevant bilateral, sub-regional, regional and global organisations and programmes, including implementation of conventions.

2 WOOD FUEL PRODUCTS

Wood fuel in this case includes charcoal and fuel wood while neglecting the black liquor.

2.1 Fuel wood and charcoal

Zugman (1995) states that, “people will use the forests to provide for their needs; how they use these forests positively or negatively will depend on economic development” state reached by the community. Unfortunately most of the woodlands, in Tanzania do not have any legal status but are just “no human’s land” and these are where a lot of uncontrolled wood harvesting and charcoal production takes place (Mnzava, 1991). About 90% of the people of Africa rely upon fuel wood. On the other hand fuel wood is the second major cause of deforestation throughout the developing world (UN, 1994).

Firewood and charcoal supply the energy needs of numerous industries and small business in the third world. In Tanzania for example the industries using much fuel include tobacco curing, salt mining (drying), Tea curing, Brick burning, fish smoking etc. (Table 2). In addition, tables 3,4,5 and 6 indicate the general trend of wood fuel consumption, which is rising with time due to population growth. This shows that the demand for fuel wood and

charcoal will continue to rise while growth of trees and shrubs (inputs) will occur at a slower rate than in the past decades (FAO, 1997).

Table 2: Fuel wood use in different processes

Product	Fuelwood used	Quantities Produced	Source
Salt (Tanga)	792m ³ /yr	1500 salt pans	Mnzava (1988)
Salt (Uvinza)	435m ³ /day	200 tons	Mnzava (1988)
Tobacco curing (Tabora)	50-60m ³	450kg	Temu (1979)

Table 3: Wood fuel consumption in Tanzania in various sectors (1000 cum) (FAO 1999)

Year	1992	1993	1994	1995	1996
Household	32,927	33,612	34,311	35,025	39,329
Industries	3,591	4,030	4,526	5,083	5,621
Others	1,990	2,157	2,337	2,737	3,001
Total	38,508	39,799	41,174	42,845	47,945

Table 4: Per capita Fuelwood consumption in Tanzania various sectors (FAO 1999) MT/cap-year

Year	1992	1993	1994	1995	1996
Household	0.796	0.785	0.777	0.771	0.834
Industries	0.093	0.101	0.11	0.12	0.13
Others	0.046	0.048	0.051	0.059	0.063
TOTAL	0.934	0.934	0.938	0.95	1.027

Table 5: Charcoal consumption in Tanzania household (000 MT) (FAO 1999)

Year	1992	1993	1994	1995	1996
Household	359	364	369	375	472
Others	33	34	35	37	37
Total	393	398	404	412	409

Table 6: Per capita total charcoal consumption in Tanzania (Ton/capita) (FAO 1999)

Year	1992	1993	1994	1995	1996
Amount	0.014	0.014	0.014	0.014	0.017

Populations in urban areas have been growing much faster than those in rural areas as the result urban households require many products from the woodlands including demand for fuel wood which probably has the most widespread negative impact on the woodlands (Campbell et al; 1996). Mnzava (1991) citing Leach et al, (1988) reports that urbanisation rate in most African countries are about five percent annually in the SADC countries in which Tanzania is a member.

The population growth trend according to Mnzava (1991) estimates is 1967 (12.3), 1978 (17.5), 1988 (23.0) and 2000 (36).

On the other hand, in Tanzania, in 1988 there was a deficit of almost 21 million m³ per year meaning that to date the deficit is even wider than ever as it is directly proportional to population increase and aggravated by deforestation. The average wood fuel use per capita is about 1.5m³/yr/pers. Or 1 ton of wood (Mnzava 1991). However, according to Ishengoma and Ngaga (2000), the average consumption of wood fuel per capita per year in five urban areas was 1.03 m³; and the per capita wood fuel consumption per urban area were Dar Es Salaam 0.6m³, Mbeya 0.99m³, Dodoma 0.9 m³, Arusha 1.86m³ and Mwanza 0.81m³.

Partly due to scarcity, much of the fuel wood has entered the market economy. In fact, even in most of the rural areas, fuel wood is becoming a commercial good. This has attracted farmers near urban areas to quit farming in order to trade in charcoal. Moreover, in coastal areas, some engage in the charcoal business during the “non-farm” periods (May through August) for a 50-60 kg bag of charcoal is usually worth US \$ 4-5 in urban areas. Nevertheless, the price raises to US \$ 6-7 in the rainy season due to scarcity. As a result of the ever-growing demand for charcoal, much is being hauled far long distance, at times more than 300 km.

2.2 Bamboo in Tanzania.

Bamboo is a member of grass family (Gramineae), subfamily Bambusoideae. The bamboo forests in Tanzania cover an estimated area of 127,000 ha with standing stock of approximately 1200 million running metres (Chihongo, 2000 Pers. comm.) These forests are mainly found in two ecological zones that are the high rainfall forests of the Eastern Arc Mountains and Lowland areas. A special research done by Shimoda (1966) was aimed to research on bamboo regarding distribution and species composition in Tanzania.

In Tanzania there are three main species of bamboo. These include *Arundinaria alpina* and close family species *A. tolangae*, *Oxytenanthera abyssinica* and close family species *O. braunii* and *Oreobambos buchwaldii* on the other hand *Bambusa vulgaris* var *striata* together with *B. multiplex*, *B. nutans*, *Chimono-bambusa hookeriana* and *B. bambos* constitute the exotic bamboo species that have shown good growth within the Tanzanian local conditions (Chihongo, 2000 Pers. Comm.).

Bamboo is contributing a lot in poverty reduction in rural areas due to its multipurpose use. Almost in every household in Tanzania a bamboo product is found either as thatching material pails, baskets, lamp holder containers etc. These are traded from rural people.

Currently a programme to research more on bamboo is starting under Tanzania Forestry Research Institute (TAFORI), INBAR and Building Research Unit (BRU) in the Ministry of Lands and Human Settlement Development (MLHSD). From this research programme, more information is expected to be gathered regarding the silviculture activities (planting) and utilisation. *Oxytenanthera abyssinica* is famous for its bamboo juice (liquor if left to ferment more). Bamboo can grow almost everywhere in Tanzania. However, coastal zones, highlands and Lake regions are potential areas for bamboo cultivation. Nevertheless, *Bambusa vulgaris* var *striata* is a good ornamental plant.

2.3 Palm products

Tanzania has wide plains that occasionally flood. These are good for various varieties of palms. The species include *Hyphaene compressa* (branding palm), *Borassus aethiopun* (doum palm), *Phoenix reclinata*, *Elaeis guineensis* (oil palm), *Raphia sp.* Although these are growing in wild, they play a vital role in poverty reduction in rural as well as urban areas. Products such as ornamental and ordinary mats, baskets, hats, brooms etc. are from palms. These are having wide markets everywhere in Tanzania.

Fruits of oil palm are a good source of cooking oil. On the other hand palm liqueur from *Borassus sp.* is a good drink and its fruits are edible.

2.4 Medicinal plants

Due to its rich biodiversity, Tanzania has the potential to deliver many varieties of products in the form of wood and non-wood products in the domestic and external trade markets. However, although Tanzania has got varied plants that are used as medicinal, the trading pattern is still internal and very scanty data is available for external trade (exports).

Economically, medicinal plants function well to a good number of people. The numerous herbalists as they call themselves and the medicinal plants section in the Muhimbili National Hospital indicate the importance of medicinal plants in the society. The Masai women on the other hand are found in big towns selling traditional medicines.

Nevertheless, it is encouraging to note that this field of study have been dealt to a great extend being in combination with food function. SIDA through RELMA (Nairobi) have done an extensive survey of such plants and a book of wild food plants of Tanzania is in the publication stage. Books of this kind have been published for Uganda (Wild Food Plants and Mushrooms of Uganda) and Kenya (Traditional Food Plants of Kenya).

In this book about 300 medicinal plant species are described. Although this has been done, the question of ascertaining the function medically is still open. *Prunus Africana* is the only medicinal plant mentioned by CITES (2000) in the international trade after the famous *Cinchona sp.* used earlier.

2.5 Food Plants

The types of food included in this type of plants include fruits, leaves (vegetables), roots, tubers and gums.

Wild foods greatly improve nutrition and increase food security particularly for rural poor without which families would go hungry or become malnourished (FAO, 1992)

2.5.1 Fruits

Fruits are used as food, beverages, and sources of essential oils for cooking (e.g. fat extracted from seed kernels). The main fruits include *Adansonia digitata* (beverage, oils, food), *Allanblackia spp.* (oils), *Parinari spp.* (oils, beverages), *Cordia sinensis* (food), *Azanza garckeana* (food), *Uapaca kirkiana* (food), beverage), *Rhus vulgaris* (food), *Vitex spp* (food), *Strychnos cocculoides* (food, beverage), *Tamarindus indica* (beverage). These are occasionally found in local markets. Needless to say, Tanzania is the richest in *Sclero carya birrea* trees in Southern Africa. Even though Tanzania possesses a widespread of all three subspecies throughout the country (i.e. *S. birrea spp. Eaffra*, *S. birrea spp. multifoliolata* and *S. birrea spp. birrea*) they are not significantly used.

2.5.2 Leaves as Vegetables

Leaves of wild plants like trees, shrubs and herbs, are a good source of food in the somewhat arid areas. The vegetables serve as buffer food supplies during the recycling periods of food shortage. Although arid areas are common, leaves and vegetables have a very important function. This is true especially where extreme drought occurs usually around the months of November through February. During this period, wild food plants take pose and act as major components of daily food deities mixed with staples (stiff porridge) from maize flour or millet.

On the other hand, in pronounced severe cases of food shortage, these wild vegetables form complete meals where staple (maize, millet flour) is not present. In Tanzania, this is a common phenomenon in parts of regions like Iringa, Dodoma, Singida and Morogoro (Mvungi 2001, Ruffo, 2000 Pers. Comm.). Indeed, these wild vegetables save the lives of thousands of poor people residing in rural areas. The major characteristic of these wild vegetables appears during the November – February period when the leaves are fresh but as they mature they exclude themselves from being eaten. In March however, beans and cowpeas from cultivated shambas replace the wild vegetables. The period of November - February is the time of high-energy requirement for cultivation and weeding their shambas. Unfortunately the period is often accompanied with a shortage of food due to poverty. The common vegetables during the period include *Zanthoxylum chalybeum*, *Adansonia digitata*, *Bidens pilosa*, *Bidens spp.*, *Sesamum spp* and many others. Very interestingly, *Z. chalybeum* and *Sesamum spp.* preserved at ground state sells for about three US dollars per kilogram in local markets and is very common.

2.5.3 Roots, tubers and gums

Roots and tubers that are obtainable from wild plants are very few. For those used as food (flour for porridge) once obtained take long processes in processing before they come to be safe to eat since in most cases they contain toxic substances. Tubers are very small in size and are too few to constitute a complete meal. The herdsmen and hunters as refreshment (water supply) eat these raw in most cases. An example of a root is *Comminphora spp.*, while an example of tuber is *Eriosema spp.* In addition gums of *Acacia spp.* are also chewed as food.

2.5.4 Edible Fungi (Mushrooms)

Edible fungi belong to family of Agaricales. In Tanzania natural mushrooms are used mainly as subsistence and very small portion being sold along the roads. On the other hand, according to BBC (2000) some mushrooms functions as medicinal plants.

Tanzania with its vast areas of woodland is having the diversity of the natural miombo ecosystems provide high potential of producing indigenous mushrooms. Records indicate that, there are about 34 species of edible mushrooms spread all over Tanzania from forests to bushlands (Harkonen *et al.*, 1995; Ruffo 1999 Pers. comm.) The 34 species are from 13 genera (Harkonen *et al.*, 1995). Some genera are found also in wetter miombo in Zaire (DRC) where 53 edible mushrooms were identified including 15 spp. of genus *cantharellus* that are found in the woodlands from October – April (Lawton, 1995). In Malawi about 60 species of edible mushrooms are reported (FAO, 2000). This shows that Tanzania also may be having more than the currently 34-recorded edible mushroom species.

The diversity of the natural miombo ecosystems in Tanzania provides the rural population with varied and nutritious diet and potentially high standard of living due to mushroom trade

(Lawton, 1995). Currently mushrooms are being sold domestically during the period (November – April) and few species are dried and stored for use during off-season time.

Table 7: The main mushroom genera and number of species found in Tanzania (Harkonen et al; 1995)

Genus	Number of Species
Termitomyces	5
Amanita	6
Macrolepiota	1
Armillaria	1
Coprinus	1
Russula	5
Lactarius	4
Cantharellus	4
Polyporus	1
Pleurotus	1
Boletes	1
Auricularia	3
Chlorophyllum	1

In addition, the medicinal aspect, other genera of non-edible are said to be important such as *Ganodema*, for domestic animals and birds (Kinabo L. 2000 Pers. Comm).

2.6 Insects of economic importance

There are many varieties of insects that are eaten or that are used to produce food items in Tanzania. The common known ones include bees, flying higher termite species (*Macrotermes*) (Kumbikumbi swah. Nywa, fihwa) and green grasshoppers (senene). The termites and green grasshoppers are of great importance in Miombo woodlands. They are traded in local markets after being fried and salted only.)

Bees: Tanzania has a high potential of beekeeping activity that places its bees wax and honey at a stable market position. Indeed, it produces about 138,000 tones of honey and 9,200 tons of bees' wax per year from about 9.2 million honey bee colonies (MNRT 2000). In Tanzania beekeeping and honey hunting in miombo woodlands can be an especially lucrative enterprise (Deweese, 1996).

There are two main groups of honeybees, namely those that sting and those harmless ones. Within the group of the bees that sting, the *Apis mellifera* species is found. Moreover, among those that are harmless, species like *Trigona denoiti*, *Meliponula juriodi*, *Trigona spinipes*, *Axestrotrigona erythra*, *Melipomula bocandei* and *Melipona sp.* can be found. In fact, these species prefer man made hives (Mpuya, 2000).

The production of honey and bees wax serves as a poverty reducer in rural areas. Most of the honey and bees wax produced is consumed locally and only small amounts are exported. The main importers of bees wax are Germany, Japan and the U.K. opposed to honey that is mainly imported by the near East and the United Arab Emirates (FAO, 2000). Table 8 indicates some quantities exported since 1996/97.

Table 8: Honey and Bees wax exported by Tanzania in 1996/97-1999/2000 (Value in “000”US \$).

Year Product	1996/97		1997/98		1998/98		1999/2000	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Bees Wax	326 t.	1359,8	449 t	1532,6	403	1440,7	643 t	2405,6
Honey	310 t.	370,094,2	190 t.	237,2	39 t	35,5	156 t.	167,7

*Source: Forest and Beekeeping Division. (Years start July 1 to June 30).

However encouraging beekeeping activities are for the ecosystem, it also ensures the community with food, cash and pollination of natural flora and agricultural crops. In Tanzania, beekeeping is a respected traditional economic activity. Overall, beeking remains an important factor among the communities residing in rural areas.

2.7 Bush Meat

In Tanzania, traditional hunting is essentially carried out by tribes who rely heavily on bush meat rather than on other types of food like honey, fruits and roots. In the case of other tribes, the activity is becoming insignificant due to the fact that it is declining as a result of population change in class dynamics.

The younger generations of males in these (other) tribes no longer carry out traditional hunting. They view it as a primitive business. In addition, the current wave migration of they younger generation to urban areas reduces the intensity of the activity. Nevertheless, there are still areas where bush meat is still of great importance. This is the case in the central parts of the country (Singida, Arusha, and Dodoma) and to a lesser extent in the Southern part of the country. The animals hunted include wild pigs, Antelopes, Dike, hares, moles.... Birds are also hunted but more especially fowls like Guinea fowls, wild ducks etc.

2.8 Natural Gums

Tanzania indigenous forests cover some 401,600 sq. Km. of which 75% is composed of different shades of miombo and Acacia woodlands. Arabic Gum is mainly produced from *Acacia Senegal* (Up to 70%) and *A. seyal* (Up to 15-25%) (Chihongo, 2000). The somewhat arid areas (about 50-60% of Tanzania) contain vast areas of Acacia Woodlands. These areas include Tabora, Singida, Arusha, Kilimanjaro, Tanga, Morogoro and Iringa.

Estimated at 1000 tons per year, half of it is exported overseas in an informal manner (Chihongo, 2000). On the other hand Tanzania has one of the largest export potentials for gum Arabic among the East African countries, though the industry is yet to be developed. In addition, Tanzania also possesses big areas (especially the Eastern Arc Mountains) where *Sterculia quinqueloba* grows. It is used to produce “Karaya gum” which has allowed Malawi to export and build up foreign exchange (Muthali, 2000).

3 PROBLEMS

The non-timber forest products (NTFP) are threatened by over-exploitation of natural resources. Examples of this are the indiscriminate harvesting of trees for charcoal and fuel wood, as well as the clearing of forests for farming. Moreover, frequent bush fires also create big obstacles in attaining sustainability of these forest products.

4 CONCLUSION

The NTFPs but especially the non-wood forest products, form a big potential toward economic development in rural areas. They are some of the key products which are of great importance in poverty alleviation in rural areas due to their cheap means of establishment and management. However, in order for these NTFPs to be more effective, research is needed in order to come up with the adequate means to facilitate the development and transfer from the field to the market place. Moreover, specific policy and regulations have to be formulated in order to cover safety issues as well as the development of NTFPs. Above all, the main problems remain that of frequent bush fires and the widespread of deforestation for agriculture.

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