Fauna and Flora studies of the Lake Bosomtwe area

This report includes an assessment of the fauna living in and around Lake Bosomtwe, followed by an assessment of the flora at Abono Forest Reserve close the Lake.

1. Assessment of the fauna living in the Lake Bosomtwe area

A faunal survey was conducted in the Lake Bosomtwe area to determine the availability of faunal species to highlight the potential of the area for biodiversity conservation.

The survey involved making direct observations and examination of spoors along trails in various sections of the study area. Trappings of small rodents and other small terrestrial mammals as well as birds and bats were also carried out.

A number of respondents including farmers, hunters, fishermen, Bush meat dealers, chop bar keepers and other inhabitants were interviewed.

The results show that the area is relatively rich in terms of diversity and abundance of faunal species. Twenty species of mammals, seven species of small terrestrial rodents and bats, thirty-four species of birds, five species of amphibians and reptiles, and seven species of butterflies were recorded.

Generally, the summits of the mountains were relatively undisturbed and were found to be ideal for satisfied the needed habitat requirement for most faunal species. Most of the species were thus recorded in these areas.

In view of the above it was concluded that the Lake Bosomtwi area has the potential for biodiversity conservation and that the proposed integrated tourism development programme for the lake area should be monitored so that biodiversity areas are not encroached upon or unduly disturbed.

It is recommended that:

1. Further follow-up surveys should be conducted over the wet and dry seasons to monitor seasonal variations in wild animal population, distribution and conservation status.
2. Conservation Education programmes should be instituted for the communities.
3. Local guides/guards should be trained in the protection and monitoring of wildlife.

1.0 Introduction

Majority of the resident human populations in local communities depend on Wildlife as a source of income to enhance their livelihoods in their local economy and also to meet their protein needs. The availability of faunal species in a specific area helps to determine the potential for biodiversity conservation in that area.

To ensure that the faunal species within the selected areas of the Lake Bosomtwi catchment area are well managed and sustained for future use and of benefit to the resident communities, there is the need to find out which species are available currently and their abundance. This report represents the findings of a faunal survey conducted in the Lake Bosomtwi area.

The objectives of the survey were therefore to:

* conduct faunal survey
* identify species of conservation concern i.e. endangered species and generate baseline population data on them

* recommend suitable alternatives to the species of conservation concern
* propose realistic targets for optimum population distribution (location specific) as a result of proper management.

2.0 Survey Methodology

Three study sites were selected. In each of the study sites 25 baited Longworth's (entrance size 9x7cm of larger animals) traps were alternately laid in a 25x25m grid for trapping rodents and other small terrestrial mammals. Trapping in each site lasted two nights.

Birds and bats trapping took place in the study sites. For this purpose two standard 12 m mist nest (heights 2.6 m) were erected for two nights (for bats) and two days (for birds). In addition, birds were observed, their calls heard along trails in the study area were recorded.

Information on large mammals was obtained from direct observation and by examination of their spoors along trails and in various parts of the study area. This was done during the day and at dusk and dawn. Additional information was obtained by interviewing hunters, bush meat sellers, and chop bar operators at Asafo market lorry-park, Atwemonom bushmeat market, Obo, Abono, Abease, Adwafo and Abrodwum. Rosevear (1965 and 1969), Meester and Setzer (1971) and Happold and Happold (1990) were used for small mammal identification. Nomenclature follows Wilson and Reeder (1993).

For bird identification Serle *et al (1982),* Brown *et al* (1982), Urban *et al* (1986), Fry *et al* (1988) and Keith *et al* (1992) were used.

Butterflies were also surveyed by direct observation and through the collection of specimen using sweeping nets along trails. Henning, S. F (1998). The Charaxine Butterflies of Africa was used for the identification of the Butterflies.

3.0 Results

3.1 Larger mammals

Twenty species of mammals were recorded in the study area. Table 3.1 shows the various species of large mammals encountered and information obtained about them from local people and bush meat traders.
Assessment of the relative abundance of each species is as shown on Table 3.1. Relative abundance ranged from common to fairly common depending on the particular species. The various categories of abundance were determined as follows:

a. common (++): reported to be present by > 25% but < 50% of interviewees and / or comprising < 25% of animals seen dead alive.
b. fairly common (+): reported to have been seen by > 10% but <25% of interviewees within the past one year.

TABLE 3.1: LARGE MAMMALS RECORDED IN THE LAKE BOSOMTWI AREA

Order	Scientific name	Common name	A	B	C	D	Relative abundance
PRIMATA	*Cercopithecus petaurista*	Spot-Nosed Monkey		X		X	++
	Cercopithecus mona	Mona Monkey				X	++
	Galago senegalensis	Senegal Galago				X	+
RODENTIA	*Cricetomys gambianus*	Giant Rat				X	++
	Euxerus erythropus	Side-Striped Ground					
	Funisciurus pyrropus	Squirrel	X	X	X	X	+
	Paraxerus poensis	Fire-footed rope				X	+
	Heliosciurus	squirrel	X		X	X	+

	rufobrachium	Green Squirrel	X			X	+
	Grahiurus christyi	Red-Legged Sun				X	+
	Anomalurus beecrofti	Squirrel	X		X	X	+
	Tryonomys swinderianus	African Dormouse		X		X	++
		Flying squirrel					
		Grasscutter					
CARNIVORA	*Crossarchus obscurus*	Cusimanse mongoose		X		X	+
	Herpestes sanguinea	Slender Mongoose				X	+
	Nandinia binotata	Two-spotted Palm		X		X	+
	Viverra civetta	Civet				X	+
	Genetta tigrina	African Civet					
		Large spotted Genet				X	+
		(Bush Genet)					
ARTIODACTYLA	*Tragelaphus Scriptus*	Bush Buck		X		X	++
	Cephalophus maxwelli	Maxwell's Duiker		X		X	++
	Cephalophus niger	Black Duiker		X		X	++
NEOTRAGINAE	*Neotragus pygmaes*	Royal Antelope				X	+

A: Observed alive during survey
B: Tracks, faeces, calls and other spoors seen
C: Carcasses seen in chop bars, with hunters and sellers
D: Reported to occur in Interview
Relative abundance (Based on rankings by respondents)
++ Common
+ Fairly common

3.2 Rodents and Bats

The various species of small terrestrial rodents were trapped, and the bats caught in two mist nets during two nights trapping in two study sites are shown in Table 3.2. Four species of small rodents, one species of megachiropteran (fruit) bats and two species of microchiropteran (insect eating bat) were trapped in the study area.

TABLE 3. 2: SMALL TERRESTRIAL RODENTS AND BATS

	FAMILY	SPECIES (SCIENTIFIC NAME)	COMMON NAME
RODENTS	*MURIDAE*	**Mus bufo**	Common mouse
		Mus minutoides	Common mouse
		Myomys fumatus	Meadow rat
		Myomys angolense	Meadow rat
BATS	**PTEROPODIDAE**	**Eidolon helvum**	Straw-Coloured fruit bat
	EMBALLONURIDAE	*Taphozous mauritianus*	Insect eating bat
	MOLOSSIDAE	*Chaerophon pumila*	Wrinkle-lipped bat

3.3 Birds

The species of birds encountered in the study area are shown in Table 3.3. A total of 34 species of birds belonging to 16 families were recorded. Out of this number, eight were caught in mist nets. No endangered bird species were encountered.

Family	Species (scientific name)	Common name
ACCIPITRIDAE	*Milvus migrans*	West African Black Kite
PHASIANIDAE	*Francolinus ahantansis*	Ahanta Francolin
CUCULIDAE	**Chrysiciccyx klass**	Klaas's Cuckoo
	Chrysiciccyx caprius	Didric Cuckoo
BUCEROTIDAE	*Tockus fasciatus*	Black and White-tailed Hornbill
CAPITONIDAE	**Lybius vieilloti**	Vieillot's Barbet
	Gymnobucco calvus	Naked-faced Barbet
	Pogoniubus bilineatus	Lemon rumped Tinker-bird
	Pogoniulus scolopaceus	Speckled Tinkerbird
LANIIDAE	**Dryoscopus gembensis**	Gambian Puff-back Shrike
	Tehagra senegala	Black Crown Tchagra
PYCNONOTIDAE	**Pyenonotus barbatus**	Common Garden Bulbul
	Andropardus gracilirostris	Slender billed Bulbul
	Chlorocichla simplex	Simple Leaf Love
TURDIDAE	**Stizorhima fraseri**	Rusty Thrush
	Turdus pelios	West African Thrush
SYLVIIDAE	**Cisticola cantons**	Singing Cisticola
	Camaroptera brochyura	Grey backed Camaroptera
	Hylia prasina	Green Hylia
	Sylvcelta virens	Green Crombec
	Camaroptera superciliaris	Yellow browed Camaroptera
MUSCICAPIDAE	**Tersiphone viridis**	Paradise Flycatcher
	Erythrocercus mccali	Chestnut-Caped Flycatcher
NECTARINIDAE	***Anthreptes collaris***	Collard Sunbird
	Nectarinia chloropygia	Olive bellied Sunbird
	Nectarinia superba	Superb Sunbird
ZOSTEROPIDAE	*Zosterops senegalensis*	Yellow White Eye
PLOCEIDAE	*Ploceus nigricolis*	Spectacled Weaver
	Euplectes orix	Red Bishop
	Malimbus Scutatus	Red-vented Malimbe
ESTRILDIDAE	**Estrilda melpoda**	Orange checked waxbill
	Nigrita bicolor	Chestnut breasted Negro-Finch
ALCEDINIDAE	*Haleyon malumbica*	Blue Breasted Kingfisher
ORIOLIDAE	*Oriolus brachyrhynchus*	Black Headed Oriole

3.4 Herpetofauna

The herpetofauna (amphibians and reptiles) of the study area assessed through observation and discussion with local people is presented in Table 3.4. One amphibian and four reptiles were recorded. No typical forest amphibia or reptile was encountered. The study did not attempt to quantify numbers of each species. No endangered species was encountered.

TABLE 3.4: HERPETOFAUNA

	SPECIES (SCIENTIFIC NAME)	COMMON NAME

Amphibia	*Bufo regularis*	Common Toad
Reptilia	*Naja melanoleuca*	Black cobra
	Dendraspis viridis	Green mamba
	Mabuya blandingi	Skink
	Agama agama	Rainbow lizard

3.5 Butterflies

Seven butterflies belonging to two families were collected as indicated in Table 3.5.

TABLE 3.5: BUTTERFLIES

FAMILY	SPECIES (SCIENTIFIC NAME)
Charaxinae	*Charaxes hildbrandti gillies;*
	Charaxes ameliae doumeti
	Charaxes auticlea proadusta
	Charaxes baumanni granti
	Charaxes pollux pollux
Limenitinae	**Euphaedra medon**
	Aterica galene

4.0 Discussions

The area is relatively rich in terms of diversity and abundance of wildlife especially bird life. Most of the 34 avian species were recorded in the relatively undisturbed areas. This area is thus suitable for bird watching. Favourable habitat conditions such as food, water and shelter, which is present in the study area also accounted for the diversity of mammals. Out of the twenty species of mammals recorded in the study area, ten species were encountered either directly and/or indirectly through their spoors. These were Grasscutter, Giant rat, Maxwell's duiker, Bushbuck, Side-stripped ground squirrel, Green squirrel, Spot-nosed monkey, Cusimanse mongoose, Black duiker, and Red-legged-sun squirrel. Four species of rodents were trapped. These were two species each of Common mice and Meadow rats.

It is important therefore that wildlife habitats are not destroyed or encroached upon so that wildlife populations are not disturbed.

The need to educate the inhabitants on the goals of wildlife conservation is paramount and must be pursued. Wild animals should not be seen in terms of its consumptive use only, where every animal sighted is hunted for either food or monetary gains but more on its non-consumptive use such as recreation and ecotourism which is capable of generating revenue while at the same time preserving both animals and their habitats.

A few inhabitants were found to be hunters while the majority were farmers and fishermen however, hunters from nearby towns hunt in the area. The rugged nature of the terrain makes it difficult for hunters to engage in their vocation. Additionally, the summit of the mountains in the area were not being farmed in most areas and as such the vegetation was relatively undisturbed and this accounted for the favourable abundance of wildlife. It came to light that chop bar keepers and bush meat traders in the Asafo suburb of Kumasi Metropolis receive supplies of bush meat from the Lake Bosomtwi area.

Conserving wild animal habitats on the one hand requires putting parts of the Lake Bosomtwi area under some form of reservation or protection for the benefit of wild animal and the maintenance of biodiversity. On the other hand it must be borne in mind that reservations restrict local peoples' access to natural resources and therefore, local

people are sometimes skeptical about the good intentions of conservationists reserving portions of their land for the benefit of wildlife and man.

Some farmers in the study area complained of wildlife crop damage caused by the primates, duikers and bushbucks while some inhabitants also complained of mongooses that prey on their fowls. The issue of wildlife and man conflict, that is, crop raiding must therefore be considered during the early stages of any reservation plan to accommodate the concerns of farmers and inhabitants.

Wildlife conservation, the maintenance of stocks of wild animals and plants, the sustainable utilisation of genetic resources etc., depends on the goodwill of the people. People do not normally give their goodwill to anybody or anything until their basic social and economic needs are satisfied (Fitter, 1986). People faced with the struggle for day-to-day survival cannot be expected to give priority to preserving resources for tomorrow when they have to make a choice today (Strong, 1984).

Any programme therefore must take cognisance of this fact and put into place poverty reduction strategies or alternate livelihoods schemes that would entice the people to conserve the available natural resources.

According to IUCN (1980), conservation emphasises the need for people to:

1. manage biological diversity as an essential foundation for the future;
2. maintain wildlife populations for their benefit; and
3. use species sustainably to enhance their quality of life.

Local people's involvement and participation in the conservation of the wildlife resources in the study area must be solicited in order to minimise local threats and to ensure the success of the programme.

Local threats to protected areas in developing countries usually arise from unsustainable exploitation through hunting, agricultural encroachment, burning, logging, collection of forest products or a combination of these (Wells and Brandon, 1992). Efforts should be made to enforce wildlife closed season prohibitions and other wildlife Laws so that the hunting of wild animals could be controlled. The absence of personnel of Wildlife Division of the Forestry Commission, the main Government agency charged with the responsibility of managing and enforcing wildlife regulations could be compensated for by the imposition of local byelaws to locally regulate the utilisation of wildlife and the challenge taken up by the local people themselves with the assistance of the District Assembly and environmental Non-Governmental Organisations. Alternatively, the Wildlife Division could be called upon to provide technical assistance.

The formation of village level wildlife conservation management committees and school clubs should be encouraged in the various villages and schools to whip up the enthusiasm of local people in wildlife conservation.

It is believed that Lake Bosomtwi derived its name from the Maxwell's duiker (*Cephalophus maxwelli*) known locally as "ɔtwe". The cultural significance of this species should therefore be highlighted and used as a basis for the conservation of other species in the area.

Finally, it is worth mentioning that two hunters from Obo who were interviewed gave descriptions of two primate species, the Olive and Western Red Colobus, believed to be present in the area. However, there wasn't any confirmation of this by other respondents. It is important that further work be done on this claim in particular to ascertain its validity since these are endangered species and their presence could give a further boost to the conservation status of the area.

5.0 Conclusion and Recommendations

With the proposed integrated tourism development programme for the Lake Bosomtwi basin, it is envisaged that various infrastructural projects would be undertaken in the area to promote both domestic and international tourism. It is therefore apparent that human population and the demand for land would increase with the consequences being an aggravation of undue pressure on the land and wildlife resources. District Assemblies, under whose jurisdiction the area falls, should ensure that any infrastructural development conforms to EPA guidelines.

It is therefore necessary that proactive measures such as formulation of byelaws, reservation/protection, conservation education and encouraging local peoples participation in wildlife conservation are put in place to control or minimise the anticipated disturbances to wildlife habitats, which could adversely affect wild animal populations and distribution in particular and biodiversity in general in the Lake Bosomtwi area. In this way, the ecotourism component of the overall tourism plan would then be achieved.

It is recommended that:

- Further follow-up surveys should be conducted over the wet and dry seasons to monitor seasonal variations in wild animal population, distribution and conservation status.
- Conservation Education programmes should be instituted for the communities.
- Local guides/guards should be trained in the protection and monitoring of wildlife.

6.0 REFERENCES

- Brown, L. H., Urban, E. K. and Newman, K. (1982). The Birds of Africa. Volume 1, Academic Press, London
- Fitter, R. 1986. Wildlife for man. William Collins Sons and Co. Ltd. Frafton Street, London. pp74 –174.
- Fry, C. H., Keith, S. and Urban, E. K. (1988). The birds of Africa. Volume 3, Academic Press, London.
- Happold, D. C. D. and Happold, M. (1990). The Mammals of Nigeria. Oxford University of Press, Oxford.
- IUCN, 1980. World Conservation Strategy. Gland Switzerland: IUCN. In: D. Anderson and R. Grove Eds. 1987. Conservation in Africa, people, polices and practice. Cambridge University Press pp.79. Also in: R.Fitter 1986. Wildlife for man. Collins Sons and Co. Ltd. pp100-101.
- Keith, S., Urban E. K. and Fry, C. H. (1992). The Birds of Africa. Volume 4, Academic Press, London.
- Neester, A. J. and Setzer, H. W. (Editors) (1971). The Mammals of Africa, An Identification Manual. The Smithsonian Institute, Washington, D. C.
- Rosevear, D. R. (1969). The Bats of West Africa. British Museum (Natural History), London.
- Rosevear, D. R. (1969). The Rodents of West Africa. British Museum (Natural History), London.
- Serle, W., Morel, G. J. and Hartwig, W. (1982). Birds of West Africa. William Collins & Son Ltd., London
- Strong, M. 1984. 3rd World Conservation Lecture, London. In: R. Fitter, 1986. Wildlife for Man. Williams Collins Sons and Co. Ltd. Frafton Street, London. pp.172.
- Urban, E. K., Fry, C. H. and Keith, S. (1986). The Birds of Africa. Volume 2, Academic Press, London.
- Wells, M. and K. Brandon. 1992. People and Parks: Linking Protected Area Management with Local Communities. World Bank/WWF/USAID, Washington D.C. pp1-11.

2. Assessment of the Flora at Abono Forest Reserve, Lake Bosomtwe

ABSTRACT. The paper:describes the vegetation surrounding the Lake Bosomtwe crater

- enumerates the numerous benefits derived from the forest and the need therefore to conserve it for future generations
- lists the plant species presently growing in the study area by scientific names, habit, common names, local names and by uses
- identifies the over-exploited, rare or threatened species
- enumerates the activities that continue to destroy the forests, and
- recommends strategies to mitigate these destructive practices

INTRODUCTION. The forest is a cherished heritage from past generations to the present generation. It is imperative that it is handed over intact to future generations, because the presence and especially the nearness of forests to any settlement is always an advantage and beneficial to the community in two main ways:

Benefits. Firstly for the direct benefits that may be obtained from it. These are the forest products like logs and fuel-wood (both grouped under major products or timber products); or pestles, sponges and chewing-sticks, latex and adulterant plants, gum-yielding and copal yielding plants, snails, mushrooms, medicinal plants, decorative plants, bush meat, or gravels and stones (normally called minor forest products or non-timber or non-wood or other forest products or lesser forest products).

Secondly for the indirect benefits derived from the forest. These include the influence of the forests on the whole environment; such as:

1. the amelioration of local climate:
   - rainfall
   - relative humidity and
   - wind
2. the protection of:
   - watersheds and catchment areas
   - animals
   - crops and
   - soil
3. the prevention of erosion, and
4. the drainage of swampy areas.

Although man depends heavily on the forest for his basic survival, and on plant products for food, medicine, clothing, shelter and numerous other needs, man's activities tend to destroy the forests and woodland - the natural habitat of these plants.

Factors of Destruction. The slash and burn system of traditional farming, with its associated shifting cultivation, is the principal cause of forest destruction and environmental degradation. Other human activities which continue to contribute to the demise of the forests in the Lake Bosomtwe crater include:

- collection and gathering of fuel-wood and
- burning of charcoal
- commercial timbering
- bush fires during the harmattan season
- exploitation of plant medicine from the wild, and
- sand/stone winning

In addition to the above is the invasion of farmlands and secondary vegetation by *Chromolaena odorata* Siam weed, popularly called 'akyeampong', a notorious weed of cultivated land throughout the forest zone.

VEGETATION. The vegetation surrounding L Bosomtwe has been described as *Celtis-Triplochiton* Association (Taylor, 1952); or Wet *Celtis-Triplochiton* Association (Mooney, 1959). A recent classification (Hall & Swaine, 1981) describes the vegetation as Moist Semi-deciduous (South-east subtype). In this type of forest, the emergent trees are *Celtis* species, locally called 'esa', and *Triplochiton scleroxylon* Obeche, locally called 'wawa'. These emergents shed their leaves annually or are deciduous.

LIST OF PLANT SPECIES. The list of plant species surrounding the L Bosomtwe crater together with the habit or life-form, the Common Name and the Local Name used by the community is given in **Table 1** below.

Species	Plant Family	Habit	Common Name	Local Name
Acacia kamerunensis	*Mimosaceae*	*Liane*	-	*ndwere*
Adenia rumicifolia spp. miegei	*Passifloraceae*	*Liane*	-	*abrafo-hama*
Adiantum vogelii	*Adiantaceae*	*Herb*	*Maiden-hair fern*	-
Agelaea trifolia	*Connaraceae*	*Shrub*		
Albizia adianthifolia	*Mimosaceae*	*Tree*	-	*pampena*
Albizia zygia	*Mimosaceae*	*Tree*	-	*okro*
Alchornia cordifolia	*Euphorbiaceae*	*Shrub*	*Christmas bush*	*gyamma*
Alstonia boonei	*Apocynaceae*	*Tree*	*Pagoda tree*	*sinduro*
Amorphophalus johnsonii	*Araceae*	*Herb*	*Johnson's arum*	*ope*
Anchomanes difformis	*Araceae*	*Herb*	*Forest anchomanes*	*ope*
Anthocleista nobilis	*Loganiaceae*	*Tree*	*Cabbage tree*	*bontodee*
Antiaris toxicaria	*Moraceae*	*Tree*	*Bark cloth tree*	*kyenkyen*
Aspilia africana	*Compositae*	*Herb*	*Haemorrhage plant*	*mfofo*
Azaderachta indica	*Meliaceae*	*Tree*	*Nim or Neem*	-
Baphia nitida	*Papilionaceae*	*Shrub*	*Camwood*	*odwen*
Baphia pubescens	*Papilionaceae*	*Shrub*	*Benin camwood*	*odwen-kokoo*
Bequaertiodendron oblanceolatum	*Sapotaceae*	*Tree*	-	*nnanfuro*
Blighia sapida	*Sapindaceae*	*Tree*	*Akee apple*	*akye*
Bridelia micrantha	*Euphorbiaceae*	*Tree*	-	*opam-kokoo*
Bussea occidentalis	*Caesalpiniaceae*	*Tree*	-	*asamamtawa*
Byrsocarpus coccineus	*Connaraceae*	*Liane*	-	*awendade*
Carapa procera	*Meliaceae*	*Tree*	*Crabwood*	*kwakuo-bese*
Cardiospermum halicacabum	*Sapindaceae*	*Climber*	*Balloon vine*	-
Carica papaya	*Caricaceae*	*Tree*	*Pawpaw*	*borofere*
Carpolobia lutea	*Polygalaceae*	*Shrub*	-	*otwewa*
Ceiba pentandra	*Bombacaceae*	*Tree*	*Silk cotton tree*	*onyina*
Celtis zenkeri	*Ulmaceae*	*Tree*	-	*esa-kokoo*
Centrosema plumieri	*Papilionaceae*	*Climber*		
Cissus quadrangularis	*Ampelidaceae*	*Liane*	*Edible-stem vine*	*kotokoli*
Clerodendrum buchholzii	*Verbenaceae*	*Liane*		
Coffea afzelii	*Rubiaceae*	*Shrub*		
Cola caricifolia	*Sterculiaceae*	*Tree*	*Monkey cola*	*ananse-adodowa*
Cola gigantea	*Sterculiaceae*	*Tree*	-	*watapuo*
Cola millenii	*Sterculiaceae*	*Tree*	-	*ananse-yayaa*
Combretum zenkeri	*Combretaceae*	*Liane*		

Costus afer	*Costaceae*	*Herb*	*Ginger lily*	*somme*
Crinum natans	*Amaryllidaceae*	*Herb*		
Ctenitis nigritiana	*Aspidiaceae*	*Herb*		
Dalbergiella welwitschii	*Papilionaceae*	*Liane*	*-*	*fafraha*
Deinbollia pinnata	*Sapindaceae*	*Shrub*	*-*	*woteegbogbo*
Dioscorea praehensilis	*Dioscoreaceae*	*Climber*	*Wild yam*	*aha-bayere*
Diospyros canaliculata	*Ebenaceae*	*Tree*	*-*	*twabere*
Diospyros monbuttensis	*Ebenaceae*	*Tree*	*Yoruba ebony*	*atwere-nantin*

Species	**Plant Family**	**Habit**	**Common Name**	**Local Name**
Dissotis rotundifolia	*Melastomataceae*	*Herb*	*Rock rose*	*bore-daso*
Dracaena arborea	*Agavaceae*	*Tree*	*-*	*ntonme*
Elytraria marginata	*Acanthaceae*	*Herb*		
Entada scelerata	*Mimosaceae*	*Liane*	*-*	*homa-kyereben*
Euadenia eminens	*Capparaceae*	*Shrub*	*-*	*dinsinkoro*
Ficus elastica	*Moraceae*	*Tree*	*Indian rubber*	*-*
Ficus asperifolia	*Moraceae*	*Tree*	*Sandpaper tree*	*nyankyeren*
Ficus sur	*Moraceae*	*Tree*	*Fig tree*	*doma*
Flagellaria guineense	*Flagellariaceae*	*Climber*		
Funtumia africana	*Apocynaceae*	*Tree*	*W A Rubber tree*	*funtum*
Gmelina arborea	*Verbenaceae*	*Tree*	*Gmelina*	
Grewia malacocarpa	*Tiliaceae*	*Climber*		
Griffonia simplicifolia	*Caesalpiniaceae*	*Liane*	*Griffonia*	*kagya*
Harungana madagascariensis	*Guttiferae*	*Shrub*	*Dragon's blood tree*	*okosoa*
Hildegardea barteri	*Sterculiaceae*	*Tree*	*-*	*osofoa*
Holarrhena floribunda	*Apocynaceae*	*Tree*	*False rubber tree*	*sese*
Hoslundia opposita	*Labiatae*	*Shrub*	*-*	*asifuaka*
Hunteria eburnea	*Apocynaceae*	*Tree*		
Hunteria umbellata	*Apocynaceae*	*Tree*	*-*	*akuama*
Hymenostegia afzelii	*Caesalpiniaceae*	*Tree*	*-*	*takorowa*
Hypselodelphys violacea	*Marantaceae*	*Climber*	*-*	*babadua*
Khaya ivorensis	*Meliaceae*	*Tree*	*African mahogany*	*odupon*
Landolphia dulcis	*Apocynaceae*	*Liane*		
Lannea welwitschii	*Anacardiaceae*	*Tree*	*-*	*kumenini*
Lantana camara	*Verbenaceae*	*Shrub*	*Wild sage*	*ananse-dokono*
Lecaniodiscus cupanioides	*Sapindaceae*	*Shrub*	*-*	*dwendwera*
Loeseneriella africana	*Celastraceae*	*Liane*		
Lonchocarpus sericeus	*Papilionaceae*	*Tree*	*Senegal lilac*	*sante*
Mallotus oppositifolius	*Euphorbiaceae*	*Shrub*	*-*	*satadua*
Mangifera indica	*Anacardiaceae*	*Tree*	*Mango*	*amango*
Mezoneuron benthamianus	*Caesalpiniaceae*	*Liane*	*-*	*akoo-bowerew*
Microdesmis puberula	*Pandaceae*	*Shrub*	*-*	*fema*
Milicia excelsa	*Moraceae*	*Tree*	*Iroko*	*odum*
Millettia zechiana	*Papilionaceae*	*Tree*	*-*	*wuram santew*
Momordica charantia	*Cucurbitaceae*	*Climber*	*African cucumber*	*nyanya*
Morinda lucida	*Rubiaceae*	*Tree*	*Brimstone tree*	*nkankroma*
Mucuna pruriens ssp. pruriens	*Papilionaceae*	*Climber*	*Cow itch*	*apea*
Mussaenda erythrophylla	*Rubiaceae*	*Climber*	*Ashanti blood*	*damaramma*

Nesogordonia papaverifera	*Sterculiaceae*	*Tree*	*Redwood*	*danta*
Newbouldia laevis	*Bignoniaceae*	*Tree*	-	*sasramansa*
Olyra latifolia	*Gramineae*	*Herb*	-	*doroben*
Oxytenanthera abyssinica	*Gramineae*	*Tree*	*Bamboo*	*mpampuro*
Parquetina nigrescens	*Apocynaceae*	*Climber*	-	*nsurogya*
Paullinia pinnata	*Sapindaceae*	*Climber*	-	*toa-ntini*
Pergularia daemia	*Asclepiadaceae*	*Climber*	-	*ponkeke*
Piper umbellatum	*Piperaceae*	*Shrub*	*Cow-foot leaf*	*amumuaha*
Pityrogramma calomelanos	*Adiantaceae*	*Herb*	*Silver fern*	-
Pleiocarpa mutica	*Apocynaceae*	*Shrub*	-	*kakana*
Psychotria calva	*Apocynaceae*	*Shrub*	-	*nkonkonua*
Pterygota macrocarpa	*Sterculiaceae*	*Tree*	*Pterygota*	*kyereye*
Pycnanthus angolensis	*Myristicaceae*	*Tree*	*African nutmeg*	*otie*

Species	**Plant Family**	**Habit**	**Common Name**	**Local Name**
Rauvolfia vomitoria	*Apocynaceae*	*Shrub*	*Rauvolfia*	*kakapempe*
Ricinodendron heudelotii	*Euphorbiaceae*	*Tree*	*African nut tree*	*wamma*
Rinorea oblongifolia	*Violaceae*	*Shrub*	-	*mpawuo*
Rottboellia cochinchinensis	*Gramineae*	*Herb*	-	*kalinyada*
Rothmannia longiflora	*Rubiaceae*	*Shrub*	-	*saman-kube*
Rothmannia whitfieldii	*Rubiaceae*	*Shrub*	-	*bobe-nini*
Sabicea calycina	*Rubiaceae*	*Climber*	-	*anansentoromahama*
Secamone afzelii	*Asclepiadaceae*	*Climber*	-	*kotohume*
Smilax kraussiana	*Smilacaceae*	*Climber*	*West African sarsparilla*	*kokora*
Spathodea campanulata	*Bignoniaceae*	*Tree*	*African tulip tree*	*kokoa-nisua*
Sterculia rhinopetala	*Sterculiaceae*	*Tree*	*Sterculia brown*	*wawabimma*
Sterculia tragacantha	*Sterculiaceae*	*Tree*	*African tragacanth*	*fosow*
Strophanthus gratus	*Apocynaceae*	*Liane*	-	*omaatwa*
Strophanthus sarmantosus	*Apocynaceae*	*Liane*	-	*omaatwa-nini*
Tabernaemontana crassa	*Apocynaceae*	*Tree*	-	*ofuruma*
Terminalia ivorensis	*Combretaceae*	*Tree*	*Shingle wood*	*emire*
Terminalia superba	*Combretaceae*	*Tree*	*Afara*	*ofram*
Theobroma cacao	*Sterculiaceae*	*Tree*	*Cocoa or Cacao*	*mpow-dua*
Thonningia sanguinea	*Balanophoraceae*	*Root parasite*	*Ground pineapple*	*kwabe-dwea*
Tiliacora dinklagei	*Menispermaceae*	*Liane*	-	*susanfo*
Tragia benthamii	*Euphorbiaceae*	*Climber*	*Climbing nettle*	*nsasun*
Trema orientalis	*Ulmaceae*	*Tree*	*Charcoal tree*	*sesea*
Trichilia prieuriana	*Meliaceae*	*Tree*	*Monkey apple*	*kakadikro*
Triclisia dictyophylla	*Menispermaceae*	*Liane*	-	*sanhoma*
Triplochiton scleroxylon	*Sterculiaceae*	*Tree*	*African whitewood*	*wawa*
Vernonia colorata	*Compositae*	*Shrub*	*Bitter leaf*	*mpona-sere*
Voacanga africana	*Apocynaceae*	*Shrub*	*Voacanga*	*mfuruma*
Wissadula rostrata	*Malvaceae*	*Herb*	-	*sowa*

Table 1. Alphabetical List of Plant Species with Habit, Common Name and Local Name

The list showing the ethnobotany of species is given in **Table 2** below. These local uses have been curled from Irvine, 1962; Abbiw, 1990; Burkill, 1985, 1994, 1995, 1997, and 2000.

Species	Plant Family	Ethnobotany
Acacia kamerunensis	*Mimosaceae*	*Fibrous stems for toothbrushes or chewing sponge*
Adenia rumicifolia spp. miegei	*Passifloraceae*	*Leaf decoction for cough, bronchitis and fever*
Adiantum vogelii	*Adiantaceae*	*Whole plant decorative and useful as house plant*
Agelaea trifolia	*Connaraceae*	*Wood used as chew-stick, whole plant ornamental*
Albizia adianthifolia	*Mimosaceae*	*Good firewood, wood-ashes used in indigo dyeing*
Albizia zygia	*Mimosaceae*	*Good firewood, bark used as a stomachic*
Alchornia cordifolia	*Euphorbiaceae*	*Roots used for jaundice, leprosy and snake-bite*
Alstonia boonei	*Apocynaceae*	*Wood for carving, latex for carious tooth*
Amorphophalus johnsonii	*Araceae*	*Attractive, ornamental plant; corm for snake-bite*
Anchomanes difformis	*Araceae*	*Rhizome eaten as famine food, stem sap for sore eyes*
Anthocleista nobilis	*Loganiaceae*	*Leaf-ashes with others used for local soap making*

Species	Plant Family	Ethnobotany
Antiaris toxicaria	*Moraceae*	*Wood suitable for planks, bark beaten as cloth*
Aspilia africana	*Compositae*	*Leaf-juice styptic, whole plant used as rabbit feed*
Azaderachta indica	*Meliaceae*	*Good firewood and charcoal, useful as avenue tree*
Baphia nitida	*Papilionaceae*	*Traditional symbol of intelligence/wise counseling*
Baphia pubescens	*Papilionaceae*	*Stems used as chew-stick and for setting traps*
Bequaertiodendron oblanceolatum	*Sapotaceae*	*The fruits are edible*
Blighia sapida	*Sapindaceae*	*Decorative tree, used for avenues, fruit aril edible*
Bridelia micrantha	*Euphorbiaceae*	*Good firewood, and for house building, fruits edible*
Bussea occidentalis	*Caesalpiniaceae*	*Hard wood, bark with maize to poison monkeys*
Byrsocarpus coccineus	*Connaraceae*	*Fruits used as teeth cleaner, twigs as chew-stick*
Carapa procera	*Meliaceae*	*Fruits eaten by monkeys, antelopes and porcupines*
Cardiospermum halicacabum	*Sapindaceae*	*Leaf irritant, rubefacient and emetic, used for dropsy*
Carica papaya	*Caricaceae*	*Fruits edible, latex useful as meat tenderizer*
Carpolobia lutea	*Polygalaceae*	*Fruits edible, stem for walking-sticks, tool handles*
Ceiba pentandra	*Bombacaceae*	*Traditionally forbidden to be felled, yields kapok*
Celtis zenkeri	*Ulmaceae*	*Good firewood, stem useful as pestles*
Centrosema plumieri	*Papilionaceae*	*Ornamental, and useful as a cover crop*
Cissus quadrangularis	*Ampelidaceae*	*Whole plant used to aid children to walk early*
Clerodendrum buchholzii	*Verbenaceae*	*Ornamental, worth introduction into cultivation*
Coffea afzelii	*Rubiaceae*	*No traditional uses documented*
Cola caricifolia	*Sterculiaceae*	*Bark for piles, leaves for ophthalmia and sleeping sickness*
Cola gigantea	*Sterculiaceae*	*Roots chewed as aphrodisiac, powdered bark applied to sores*
Cola millenii	*Sterculiaceae*	*Kernels eaten like kola, species useful as stock for true colas*
Combretum zenkeri	*Combretaceae*	*Twigs chewed for menstrual pains, roots for dysentery*
Costus afer	*Costaceae*	*Ornamental, traditionally used for purification rituals*
Crinum natans	*Amaryllidaceae*	*Decorative aquatic plant, useful feed for the hippopotamus*
Ctenitis nigritiana	*Aspidiaceae*	*Decorative fern, worth introduction into cultivation*
Dalbergiella welwitschii	*Papilionaceae*	*Traditionally forbidden to be cut due to presence of red latex*
Deinbollia pinnata	*Sapindaceae*	*Fruits eaten by man and beast, leaves for bronchial troubles*
Dioscorea praehensilis	*Dioscoreaceae*	*Tubers eaten by man and elephants*
Diospyros canaliculata	*Ebenaceae*	*Fruits used as fish poison, bark extract for arrow poison*
Diospyros monbuttensis	*Ebenaceae*	*Decoction of bark and leaf-tips applied and drunk for leprosy*

Dissotis rotundifolia	*Melastomataceae*	*Plant used in bronchitis, fevers and catarrh, decorative*
Dracaena arborea	*Agavaceae*	*Useful for boundary planting, associated with fetish practices*
Elytraria marginata	*Acanthaceae*	*Leaf decoction for gonorrhoea, leaf-sap against miscarriage*
Entada scelerata	*Mimosaceae*	*No uses documented*
Euadenia eminens	*Capparaceae*	*Roots used for ear-ache, whole plant decorative*
Ficus elastica	*Moraceae*	*Decorative house plant, latex used as bird-lime*
Ficus asperifolia	*Moraceae*	*Leaves used as sand paper, wood-ashes used in indigo dyeing*
Ficus sur	*Moraceae*	*Fruits edible, abundance of fruits symbolize fertility*
Flagellaria guineense	*Flagellariaceae*	*Whole plant for skin-disease, and refractory leg ulcers*
Funtumia africana	*Apocynaceae*	*Wood for carving, and latex used to adulterate rubber*
Gmelina arborea	*Verbenaceae*	*Tree used to crowd out and control grass, leaves as fodder*
Grewia malacocarpa	*Tiliaceae*	*Stems used for basketry, fruits eaten by birds*
Griffonia simplicifolia	*Caesalpiniaceae*	*BSII lectin isolated from seeds and used in blood grouping*
Harungana madagascariensis	*Guttiferae*	*Resin used for sores, itch, scabies, ringworm, crawcraw*
Hildegardea barteri	*Sterculiaceae*	*Wood for carving utensils, seeds eaten raw or roasted*
Holarrhena floribunda	*Apocynaceae*	*Wood for carving, latex used to adulterate rubber*
Hoslundia opposita	*Labiatae*	*Plant decoction drunk for stomach trouble and gonorrhoea*
Hunteria eburnea	*Apocynaceae*	*Root-bark paste applied to leprous sores, fruits toxic*
Hunteria umbellata	*Apocynaceae*	*Root decoction prevents miscarriage and treats menorrhoea*

Species	**Plant Family**	**Ethnobotany**
Hymenostegia afzelii	*Caesalpiniaceae*	*Root decoction for cough, wood used as firewood*
Hypselodelphys violacea	*Marantaceae*	*The plant is a traditional symbol of strength and durability*
Khaya ivorensis	*Meliaceae*	*First-class timber tree, bark for cough or rheumatic pains*
Landolphia dulcis	*Apocynaceae*	*Latex as bird-lime, bark and root decoction as galactogogue*
Lannea welwitschii	*Anacardiaceae*	*Root decoction is expectorant or emetic, and taken for cough*
Lantana camara	*Verbenaceae*	*Notorious weed, leaf decoction with others for yellow fever*
Lecaniodiscus cupanioides	*Sapindaceae*	*Excellent firewood, bark infusion as purgative*
Loeseneriella africana	*Celastraceae*	*Stems used as binding material in house-building*
Lonchocarpus sericeus	*Papilionaceae*	*Yellowish-orange dye or resin in seeds, green dye from plant*
Mallotus oppositifolius	*Euphorbiaceae*	*Root as enemas for lumbago, leaf decoction as vermifuge*
Mangifera indica	*Anacardiaceae*	*Fruits eaten, stem bark infusion taken against diarrhoea*
Mezoneuron benthamianus	*Caesalpiniaceae*	*Bark and root decoction for urethral discharge*
Microdesmis puberula	*Pandaceae*	*Root decoction for gonorrhoea, twigs serve as chew-sticks*
Milicia excelsa	*Moraceae*	*Wood for all-purpose timber, latex as rubber adulterant*
Millettia zechiana	*Papilionaceae*	*Bark-pulp as gargle for rhino-pharyngal/ bronchial troubles*
Momordica charantia	*Cucurbitaceae*	*Seeds used for abortion, whole plant features in rituals*
Morinda lucida	*Rubiaceae*	*Root/leaf decoction for amenorrhoea/absence of menstruation*
Mucuna pruriens ssp. pruriens	*Papilionaceae*	*Stinging hairs used as anthelmintic, and in arrow poison*
Mussaenda erythrophylla	*Rubiaceae*	*Symbol of war among Ashantis, decorative as house plant*
Nesogordonia papaverifera	*Sterculiaceae*	*Wood useful for timber, gun butts and mortar carving*
Newbouldia laevis	*Bignoniaceae*	*Fetish and sacred plant, flowers decorative, roots for orchitis*
Olyra latifolia	*Gramineae*	*Seeds used for beads, hollow internode for tapping palm-wine*
Oxytenanthera abyssinica	*Gramineae*	*Stems as rafters for building, canoe poles and spear shafts*
Parquetina nigrescens	*Apocynaceae*	*Decorative, root decoction for snake-bite, latex for diarrhoea*
Paullinia pinnata	*Sapindaceae*	*Whole plant pulp used in casts for mending broken bones*
Pergularia daemia	*Asclepiadaceae*	*Features in fetish rituals, leaf decoction for stomach ache*
Piper umbellatum	*Piperaceae*	*Tender leaves used as vegetable, leaf macerate for toothache*
Pityrogramma calomelanos	*Adiantaceae*	*Whole plant ornamental and used as house plant*

Pleiocarpa mutica	*Apocynaceae*	*Of distinct ornamental value, bitters of roots used for jaundice*
Psychotria calva	*Apocynaceae*	*Roots used with others for cough and whooping cough*
Pterygota macrocarpa	*Sterculiaceae*	*Wood for carpentry, leaf decoction for urinary complaints*
Pycnanthus angolensis	*Myristicaceae*	*Seed oil for soap-making, root infusion as anthelmintic*
Rauvolfia vomitoria	*Apocynaceae*	*Root decoction as strong sedative for mental patients*
Ricinodendron heudelotii	*Euphorbiaceae*	*Wood for general carving, roasted seeds edible*
Rinorea oblongifolia	*Violaceae*	*Stems used for walking-sticks, spoons and combs*
Rottboellia cochinchinensis	*Gramineae*	*Crashed flowers inhaled for asthma, whole plant for hernia*
Rothmannia longiflora	*Rubiaceae*	*Long tubular flowers decorative, fruit-pulp emetic*
Rothmannia whitfieldii	*Rubiaceae*	*Flowers decorative, fruit juice applied to leprous sores*
Sabicea calycina	*Rubiaceae*	*Leaves taken as laxative, and to aid children to walk*
Secamone afzelii	*Asclepiadaceae*	*Copious latex used as lactogenic, whole plant for gonorrhoea*
Smilax anceps	*Smilacaceae*	*Tubers edible as famine food, roots for arthritis/rheumatism*
Sterculia rhinopetala	*Sterculiaceae*	*Wood is useful timber for carpentry and paper-pulp*
Strophanthus gratus	*Apocynaceae*	*Flowers decorative, latex as adhesive in arrow poison*
Strophanthus sarmantosus	*Apocynaceae*	*Flowers decorative, latex as adhesive in arrow poison*
Terminalia ivorensis	*Combretaceae*	*Split timber as shingles, planks in lorry body construction*
Terminalia superba	*Combretaceae*	*Timber for furniture, panels and general construction*
Theobroma cacao	*Sterculiaceae*	*Dried seeds for the manufacture of butter and chocolate*
Thonningia sanguinea	*Balanophoraceae*	*Ground rhizomes inhaled to relieve asthma*
Tiliacora dinklagei	*Menispermaceae*	*Used in treating gastric fevers and menstrual irregularities*
Tragia benthamii	*Euphorbiaceae*	*Whole plant used as an abortifacient to promote delivery*
Trema orientalis	*Ulmaceae*	*Leaf eaten and an infusion drunk to expel worms*
Trichilia prieuriana	*Meliaceae*	*Bark is febrifugal, leaf with bark and root for arthritis*
Triclisia dictyophylla	*Menispermaceae*	*Root-bark for stomach pains, dysentery and convulsive cough*
Triplochiton scleroxylon	*Sterculiaceae*	*Timber hewn for canoes and split for boards and scantlings*
Vernonia colorata	*Compositae*	*The sap for gastro-intestinal complaints/urethral discharge*
Voacanga africana	*Apocynaceae*	*Leaf sap in nose-drops for insanity, root for heart-troubles*
Wissadula rostrata	*Malvaceae*	*Plant preparation as laxative in treating jaundice*

Table 2. Alphabetical List of Plants with their Ethnobotany

THREATENED PLANTS. Commercial timbering in the L Bosomtwe crater by Bilson and others have virtually wiped out many of the economic or merchantable timber trees. The only one timber species that occurs in moderate populations is *Nesogordonia papaverifera,* locally called 'danta'. A list of timber trees that need to be re-introduced is given in **Table 3** below.

Species	Plant Family	Local Name
Aningeria robusta	Apocynaceae	asamfena
Entandrophragma angolense	Meliaceae	edinam
Entandrophragma candollei	Meliaceae	candollei
Entandrophragma utile	Meliaceae	efo-borododedwoo
Entandrophragma cylindricum	Meliaceae	apenkwa
Guarea cedrata	Meliaceae	kwabohoro
Guarea thompsonii	Meliaceae	kwadwuma
Khaya anthotheca	Meliaceae	krumben
Khaya ivorensis	Meliaceae	dubini

Lophira alata	Ochnaceae	kaku
Lovoa trichiloides	Meliaceae	dubinibiri
Mansonia altissima	Sterculiaceae	oprono
Milicia regia	Moraceae	odum
Milicia excelsa	Meliaceae	odum-nua
Nauclea diderrichii	Rubiaceae	kusia
Piptadeniastrum africanum	Mimosaceae	danhoma
Sterculia rhinopetala	Sterculiaceae	wawabimma
Terminalia ivorensis	Combretaceae	emire
Tieghemella heckelii	Sapotaceae	baku
Triplochiton scleroxylon	Sterculiaceae	wawa

Table 3. Merchantable timber trees virtually wiped out through over-exploitation

RECOMMENDATIONS. In view of the importance of the forest to mankind, it is imperative to conserve it and utilize its products in a sustainable manner for the present and future generations.

1. **Education.** The local community must to be educated on the importance of plants and wild animals and the need to conserve the forests which protect this heritage. The education should not be limited to hunters, farmers and adults alone; but include school children and the youth. In addition to the direct benefits, the indirect benefits of conserving an intact forest, which might not be easily pictured nor understood by rural folks, need to be stressed. These are:

- amelioration of climate
- protection of watersheds, catchment areas, animals and crops, and
- the prevention of erosion

2. **Farming.** The traditional farming method of slash and burn, with its subsequent shifting cultivation, has been the principal cause of forest destruction. To save any remaining forests from a similar fate, revolutionary and modern methods of farming must be taught and enforced. Burning the bush before planting and shifting cultivation must be stopped; and crop rotation introduced.

Stop Burning. The traditional practice of burning farmlands to get rid of the debris before planting crops is a waste and need to be stopped. As a direct result of this burning, all the humus that have taken years to accumulate, and which crops require for proper growth, are destroyed. In addition, earthworms and other micro-organisms, also beneficial to plant development are killed. Instead of burning, traditional farmers must be educated to cut up the farm debris into pieces for manure and compost - to enrich the soil for the crops. The bigger pieces of wood could be carbonized into charcoal, the branches and twigs serving as firewood. Farmers in Wa, in the Upper West Region, have adopted this latter practice of preparing the land for farming under the able leadership of the Wa-Na with astounding success.

Stop Shifting Cultivation. As a further step in preventing forest degradation, the traditional practice of shifting cultivation must be discouraged.

Crop Rotation. The rotation of crops on the same farm, in addition to the application of farm manure and compost, would enable farmers to crop the same piece of land year after year. The present wasteful and environmentally unfriendly practice of shifting to a more fertile piece of land every two or three years, clearing it, burning it before cropping, only to be abandoned, would then be unnecessary.

Stop farming on high slopes. As a means of improving upon the scenery in the crater, farmlands on the very high slopes should all be replanted with trees. The taungya system of re-afforestation could be used where trees are planted among the crops for up to three years. The affected farmers could either be coerced, convinced or compensated to move to a lower ground.

3. **Replant Open Patches.** There is need for massive replanting of all the open patches of the crater caused either by erosion or traditional farming methods or logging or bush-fires. Seedlings for re-planting should be nursed for at least one year before they are transferred to the field. The planting is usually in June/July, at the peak of the rains; with beating up (re-planting of seedling which failed) in September/October. The plants for the replanting are:

- commercial timber trees (see Table 3 above)
- *Bambusa vulgaris* Yellow and Green Striped Bamboo and *Oxytenanthera abyssinica* Bamboo
- *Leucaena leucocephalla* Leucaena, and
- Conifers

The introduction of coniferous plants like those at Obo Kwahu in the Eastern Region and Daboase in the Western Region, to the L Bosomtwe crater would improve the scenery befitting its national and international status as both a centre for tourism and for scientific research (ref. attached paper).

4. **Protect Medicinal Plants.** An estimated 75% of the population in both the urban centres and the rural areas depend on plant medicine for their everyday health-care needs. In view of the importance of plant medicine in the health care of the people, it is important to conserve it for the present and future generations. With traditional medicine men, there appears to be no problem, because medicinal plants are harvested in a sustained manner. For instance, traditionally, plants dug for their roots are covered up again with soil, allegedly to ensure the efficacy of the medication - but it appears the practice is, in effect, a conservation measure.

The problem is with companies and individuals who harvest and export plant medicine in commercial quantities. It is recommended that within the L Bosomtwe crater commercial exploitation of whole plants, bark, roots and tubers, corms and rhizomes from the wild should be banned by legislation. As a deterrent, defaulters should be made to pay heavy fines - in addition to the confiscation of the plant material illegally collected.

Practitioners and exporters of medicinal plants should also be encouraged to cultivate medicinal plants to replace those that they collect.

5. **Protection from Fire.** The forest surrounding the L Bosomtwe crater was burnt by bush-fires in 1983 and again in 1993-4 - in both instances during the harmattan season between November and February. To prevent the recurrence of these fires, there is need to:

- form volunteer fire-fighting groups
- cut fire traces round the forest
- build fire towers where necessary
- have a communicating system to report any incident of bush-fires, and
- build a fire-fighting station near-by - say at Ejisu or even at Kuntanase.

6. **Involvement of Local People.** The local people who own the forest have to be involved in all aspects of managing and protecting these forests. There is already some evidence of this in Abono. Resource persons could be called in to advice and give appropriate guidelines for the take of, but the implementation should be left to the residents.

CONCLUSION. With all the benefits enumerated above that can be derived directly from the forest and indirectly from its influence on the environment, it is in the interest of the residents of Abono to protect this heritage; and to hand it over intact to their descendants. Secondly, since L Bosomtwe is of national importance, being the only

natural lake in the country, funding by the Government and NGO's should be made available to give all the assistance required by the local people to develop and conserve the forest, and to improve upon the present scenery to help attract more tourists to the crater.

REFERENCES.

ABBIW, D.K. (1990) *Useful Plants of Ghana.* Intermediate Technology Publications, London; and Royal Botanic Gardens, Kew.

BURKILL, H.M. (1985) *The Useful Plants of West Tropical Africa* Vol.1. Royal Botanic Gardens, Kew.

"" (1994) "" Vol. 2.

"" (1995) "" Vol. 3.

"" (1997) "" Vol. 4.

"" (2000) "" Vol. 5.

HALL, J.B. & SWAINE, M.D. (1981) *Geobotany. Distribution and ecology of vascular plants in a tropical rain forest. Forest Vegetation in Ghana.* Dr. W Junk Publication. The Hague

IRVINE, F.R. (1961) *Woody Plants of Ghana.* Oxford University Press. London.

MOONEY, J.W.C. (1961) Classification of the vegetation of the forest zone of Ghana. In: Tropical Soils & Vegetation Proceedings of the Abidjan Symposium. pp. 85-86. UNESCO-Paris.

TALBOT, M.R. & DELIBRIAS, G. (1977) Holocene variations in the level of Lake Bosomtwi, Ghana: In Nature Vol. 268. No .5622 pp. 722-724.

TAYLOR, C.J. (1952) The Vegetation Zones of the Gold Coast. Bull. Gold Coast For. Dep. 4:1-12.