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“to improve the existing situation... requires more knowledge about the mountains and inhabitants, political will, good economic incentives and skillful communication.” Anon, 1992 (An Appeal for the Mountains)

Neglected Treasure: An Overview of Ethiopia's Vegetation

By Mesfin Tadesse

Ethiopia's vegetation, as a result of years of heavy exploitation and neglect, is at a point of no return. How much of grassland, woodland or forested land did Ethiopia have at one time, and how much exists today? What are the component species of these vegetation types? What are the interactions between the components? How many of these are locally and globally useful? Are any of the component species threatened or extirpated? Do they receive any protection and care? Who benefits from their well being and upkeep? With such questions in mind, this article gives an overview of the local and global usefulness of Ethiopia's vegetation and also discusses the efforts that have been made and that should continue to be made to save this national asset from further decline {unless otherwise indicated, plant names are in Amharic).

Ethiopia's gifts to humanity

Ethiopia has contributed quite a great number of economically and aesthetically valuable plants to the world. With respect to edible plants, for example, a variety of barley (*gebs*)

which is resistant to yellow barley disease and which is now quite widely used in the European and American bread industry was originally obtained from Ethiopia. From this variety alone, farmers in the United States obtain about 150 million dollars per year. The popular arabica coffee (*bunna*) was originally obtained from Ethiopia and then cultivated in "Arabia Felix" or Yemen from where it spread to the Far East (Java, Sri Lanka), the West Indies and South America. An important edible oil producing plant, niger seed (*nug*), which is native to the Ethiopian highlands, is currently extensively cultivated in India as a commercial crop. Indeed, the Ethiopian highlands harbor many locally and globally useful edible plants: Ethiopia has good quality genetic material for durum wheat, barley, sorghum (*mashilla*), linseed, finger millet, chick pea (*shimbra*), sesame, garden cress, okra, indigo, fenugreek (*abish*), cowpea and the Ethiopian rape (*gommen zer*). Sorghum is supposed to have been domesticated from wild species in Ethiopia about 5000 years ago. It spread from Ethiopia to the rest of East Africa, across the Sudan to West Africa and also, to southern Africa through the Congo.

Today, sorghum is the major staple of many people in Africa.

There are, similarly, many medicinal plants. For example, the root bark of a tree known locally as *waginos* (in Ge' ez) has been used by people living in northern Ethiopia for many centuries for treating dysentery. According to Richard Pankhurst, the Scottish traveller James Bruce, who came to Ethiopia in search of the source of the River Nile and stayed there from 1769 to 1771, was attacked by dysentery when he was about to leave the country. He tried to cure himself with medicines he had brought along from Europe but was not successful. When observing that he would not be able to make it to Europe travelling through the hot landmass of Sudan and Egypt, the chief of Ganjar of *Shanquilla* advised him to take a well established local drug known as *waginos* or '*yedega abalo*'. The root barks of this plant were cleaned, dried in the sun, and ground into powder. James Bruce took two spoonfuls of the powder with camel's milk. After the sixth or seventh day Bruce regained his health and was able to continue his journey to the United Kingdom; the plant was later named *Brucea antidysenterica*. The plant has also been under study in Europe for its anti-cancer properties.

Another example is koso, a medicinal plant which effectively rids the stomach of worms. Koso was brought to Europe in 1816 by a French physician named A. Brayers, who had been introduced to the plant by an Armenian merchant who frequently travelled to Ethiopia. Nightshade (*geber imbuay*), another native plant of Ethiopia, is currently the subject of an intensive agro-industrial project in Ecuador by Pronetac, an affiliate of Schering A.G. of West Berlin.

The fruit of this plant is the raw material for the synthesis of cortisone and steroid hormones. The plant, particularly the spineless form, has also been cultivated as an ornamental plant in Europe and elsewhere for over two centuries.

A recent study by the United States Department of Agriculture has identified yet another potentially globally useful plant from Ethiopia. This is a small annual plant initially gathered from near Harer in eastern Ethiopia and now cultivated in Kenya and Zimbabwe after the laboratory investigation revealed that it is "a good source of seed oil rich in epoxy acids, which can be used to manufacture plastic formulations, protective coatings, and other products... it is a promising new crop for semi-arid areas."

There are also less internationally known endemic crop plants such as '*teff*, the staple food of much of highland Ethiopia; *inset*, from whose stem (corm) and leaves starches are extracted, prepared in various ways and consumed mostly in central and southern Ethiopia; *anchote* (Oromo), and Oromo *dinich*, two root crops widely utilized in particularly Wellega, in south-western Ethiopia, either as a main or side dish. *Teff* is now widely grown in South Africa and Australia for hay production, and in India as a green fodder. It is also grown as a crop plant in parts of the U.S.A.

The "Wild Supermarket"

In addition to cultivated plants, the Ethiopian "wild supermarket" has a lot to offer to humanity. In connection with current studies on biodiversity, scientists have found that over 200 species of wild and semi-wild plants are

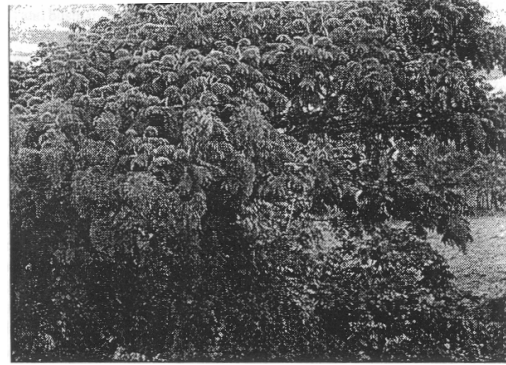
widely utilized in Ethiopia either at all times or during times of food shortage.

For example, people who have visited the Merkato in Addis Ababa may have heard small boys and girls shouting "*dingetegna, dingetegna*" (meaning one that brings about quick relief for any sudden gastrointestinal pain), trying to sell a small packet of bundled-up twigs. The chemistry of this wild plant was recently studied in the Addis Ababa University (AAU) and was shown to contain compounds that are similar to those we find in many pain relieving pills or tablets. Other valuable wild plants include *mettere* and *inkokko*, plants that effectively dispel tapeworms, tamarinds (*humer*) that are used as antimalarial (the fruits of the latter are also found in stores in North America), hops (*gesho*) which serve as antifungal agents, *limmich* [Amharic, *kwi'ha* (Ge' ez and *Tigrinya*), *aleitu* (*Oromigna*)] which are used for cleaning teeth, and many others that are used in making preserves, jams, marmalades or jellies.

Apart from those plants which are edible or which have medicinal value, the Ethiopian highlands also harbour a number of plants that are actually or potentially useful in the lumber and paper industries, apiculture and in other sectors of the economy. In the early 1970s, Ethiopia exported logs and poles (derived particularly from blue gum or *bahir zaf*) to neighbouring countries and to Yemen and Saudi Arabia where the demand for construction material, including support for vineyards, was high. Much of this activity, which was due to the efforts of private investors, dissipated following the nationalization of land.

In apiculture or beekeeping, of all the countries in the world, probably none

has a longer tradition than Ethiopia. The hieroglyphs of ancient Egypt



refer to Ethiopia as the source of honey and beeswax. Ethiopia has the highest bee density in Africa, and is the fourth largest wax producing and the tenth largest honey producing country in the world. All this is partly due to the relatively higher percentage of vegetation cover in Ethiopia than in many other African countries. Further decline in this treasure would not only damage Ethiopia' s position in this sector of the economy but also causes the loss of its "honeybeer, *tej*, which has long been [recognized as] the national beverage."

The Value of the Vegetation

Perhaps the first study of the Ethiopian forests was done by an American forester named Logan, who studied the forests in southern Ethiopia between 1940 and 1945. According to Logan, "prior to the Italian occupation, little or nothing was done to assess [the] value of [Ethiopia' s forests] as a national asset or to conserve and develop them." Sadly, although there have been some reports and inventories of the forests since 1946, the study and documentation is not nearly as advanced as it should be. What we do know of our forests is that they contain important native trees such

zigba, tid, kererro and sembo, but due to factors such as inadequate protection, improper management, and altered and detrimental relationships with the local environment they are deteriorating.

Even fewer studies have been done on lowland vegetation and grasslands, perhaps because the value of the woodlands and grasslands were, compared to forests, only relatively recently realized. When, for instance, the demand for gum Arabic and frankincense, obtained from plants growing in dry areas, began to increase, the exploration of woodlands and



bushlands was started. When the International Livestock Centre for Africa began to study species in grazing lands in Jijiga and surroundings, similar grazing lands and particularly grasslands were set aside as sites for livestock development in southern Ethiopia.

The study of indigenous plants is an even more recent phenomenon. While it is unfortunate that such studies were not begun earlier, with respect to regenerating indigenous plant life, there is some hopeful news. For example, the soil seed bank in a number of places was found to contain the gene pool necessary for regeneration of forests and

woodlands. Germination of indigenous tree seeds, long considered a difficulty in tree regeneration, is no longer an insurmountable problem. Plant physiologists in Addis Ababa University (AAU) have been able to break the barrier in a number of plants.

These initial efforts notwithstanding, the country clearly needs a careful and systematic study of its plant life both to value its resources and to develop an intelligent development and conservation strategy. The efforts of the Ethiopian Flora and Ecology Projects, a joint undertaking between the AAU and the University of Uppsala in Sweden, are perhaps the most significant current work in this regard.

These Projects, which started in 1980 and 1987, respectively, in addition to surveying the higher plant species in Ethiopia and the ecology of selected parts of the country, are also attempting to lay the foundation for a long-term study of the Ethiopian vegetation. So far three volumes covering about one-third of the species in the country have been published under the Flora Project. This Project-in particular has trained personnel, the majority up to the level of Ph.D., and has improved the research capability of the site of the Projects, the National Herbarium in the Department of Biology, by increasing the number of research specimens available to the National Herbarium from about 16,000 in 1980 to over 70,000 in the early 1990s, by establishing and maintaining a research library and by acquiring important equipment and supplies. By publishing the Flora volumes within Ethiopia, the Project has assured their sale at affordable prices within the country and also supplied over 1,000 copies of each volume free to the Ministry of Education to be distributed to high schools throughout the country.

The Projects also maintain good relationship with institutions particularly in Europe (London, Paris, Firenze and Uppsala) that have historical collections of Ethiopian plants, such as those gathered by the German plant collector, Wilhelm G. Schimper, from Tigray and Gonder from 1838 to about 1878. Indirectly, the Project has also helped train botanists from Sudan, Kenya and Tanzania and technicians from various institutions in Ethiopia. If developed further, the National Herbarium could become a botanical research centre not only for Ethiopia but also for countries in North-East and East tropical Africa.

Efforts to Conserve and Develop the Vegetation

Has there been any consistent effort to conserve and develop the Ethiopian vegetation? The answer is, unfortunately, no. With a few exceptions, no serious attempt to replant indigenous trees were made until about 30 years ago. One notable exception was the result of the commendable foresight of Emperor Zera Yakob (1434-1468), who is said to have ordered the planting of seeds of juniper (*tid*), olive (*woira*) and podo (*zigba*), all collected from the WofWasha forest near Debre Sina, on the Menagesha Mountain. Today, the Menagesha forest is one of the best preserved forests in the country. Another exception came through the efforts of Emperor Menelik II. Noting the disappearance of the native vegetation from many of the settlements around him, Emperor Menelik II solicited the help of knowledgeable people, and upon hearing about *bahir zaf*, he ordered its introduction in 1895. *Bahir zaf* or blue gum gradually covered a good deal of highland Ethiopia and in

some places it completely replaced the indigenous plants. Unfortunately, '*bahir zaf*', although a fast growing plant, has had adverse consequences for the environment, as recent studies regarding its impact on the soil and other plants have shown.

As a result of this negligence, with the exception of a few patches of forests here and there and particularly in conjunction with the proclamations set forth to delineate National Parks and wild life sanctuaries, there has never been a comprehensive program of conservation and development of vegetation in Ethiopia. This is apparent from the figures that are often quoted about the status of forests in Ethiopia: "of the original 35% forest cover, 16% was left by 1952, 3.6% by 1980, 2.7% by 1987 and about 2.4% by 1990". Only a few forests, such as those which were under private ownership such as that in Anabe in Wello, and under government control such as Menagesha forest in Shewa and Yegof forest in Wello, are well preserved.

What are the constraints to conservation and development? It is always difficult to give a clear-cut answer to such questions. However, the land-tenure system is central to understanding and resolving the problem. A historical account of environmental degradation, particularly in northern Ethiopia, indicates that degradation was caused mainly by the changes in the social organization and in land holding system which allocated all land other than that under cultivation to communal ownership. Communally owned land in northern Ethiopia was unscrupulously exploited and later neglected. That is why we come across extensive areas of bare land in northern Ethiopia today. That form of land

ownership, used later in the central and southern parts of the country, has failed to allocate clearly both the right to use of land and the responsibility to care for it, except in areas such as those inhabited by the Konso ethnic group in southern Ethiopia. This lack of responsibility and accountability also helps explain why, during periods of unstable or transitional governments, many forests, woodlands and plantations are put to fire, wildlife conservation sites threatened and facilities therein ransacked.

Perhaps, then, the answer lies in a different form of land ownership. For example, in the developed parts of the world, government controlled land is considered "publicly" owned. The public is made aware of its rights and responsibilities as to the use of the land and its produce, and is prohibited from using such property in a manner inconsistent with its legally designated uses. Thus, certain areas are set aside for recreational use only, whereas others may be forested or mined so long as the government is compensated for. The government also provides the necessary personnel and facilities, including infrastructure for research and development to maintain the continued existence of vegetation and other wildlife on public property. Through establishing or participating in learned societies, these governmental institutions increase the awareness and participation of the public in maintaining the property. In Ethiopia, land has been under government ownership for some time, but can such land be considered "public" property? Even if this assumed to be so, has the government created outlets for the public's demands for produce from the land? Has the level of awareness of the public been elevated to

the extent that it would take communal land as its own property and would take care of it? Have the governmental institutions been able to carry out their responsibilities in manners that are satisfactory to the public? Are they accountable to the public?

In opposition to land owned by the government is land under private ownership. Such land is a commodity to be developed, maintained or modified as per the demands of the market forces. Profitability and the changing market value determine the status of the vegetation and other objects on such land. Similar forces were operating on land under private ownership in pre-Revolutionary Ethiopia; it was at that time that the country was able to export some of its wood products.

Drawing from the experience of the developed countries, it would appear that in order to conserve and develop the Ethiopian vegetation, it is necessary to consider the following points:

1. Assessment and either change or amendment of previous policies and programs of renewable resource utilization and development.
2. Establishment of private ownership of land. Farmers should be allowed to have their own farmlands and their own forests. Let us not forget the famous biological dictum which asserts that the 'selfish gene' craves a niche of its own and this is perfectly natural.
3. Creation of an independent body for forestry: to date forestry is kept as a small department within the Ministry of Agriculture.
4. Establishment of a school or college of forestry.

At such an institution:

- ✚ Researches and developers of forests would be created;
- ✚ Indigenous knowledge and practices of resource development would be recognized;
- ✚ Research into and development of indigenous knowledge and practices would be carried out;
- ✚ Research on and promotion of native plants and careful assessment of exotic plant introductions would be made.

5. **Development of the National Herbarium at Addis Ababa University into a truly first class institution so that it can play an enhanced role as the repository of information about Ethiopian plants. Development would require strengthening the infrastructure, personnel and facilities of the National Herbarium**

Conclusion

There is no question that Ethiopia has been blessed with a rich and diverse indigenous plant population. As discussed above, the value of this vegetation for the food supply, for medicinal purposes and for contributing to the economy of the country is considerable. The preservation and intelligent development of this natural resource must be a top priority for governmental and private institutions, as well as for individual citizens.

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