

Review

Towards conservation of Nigerian medicinal plants

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The scientific world today, seems to have gone indigenous, searching the grassroots for potential plants and animals that could confer solutions to problems that have puzzled mankind, to search for newer and more potent drugs and perhaps even to develop vaccines against diseases plaguing the nation. Whatever it may be, it is not farfetched to say that indigenous knowledge is now the “in-thing”. Africa is naturally endowed with the richness of diverse and mostly un-investigated flora and fauna, and this has placed this continent on priority for indigenous investigations. Nigeria is one of such nations, showing a growing boom of indigenous based research especially in the use of medicinal plants. However, it is interesting to note that over the years, great efforts have been put in place for the conservation of its diverse fauna, thus overshadowing the relevance of plant conservation, especially the medicinal plants. This paper aims at highlighting the importance of adopting proactive measure through education and local communities’ participation in order to conserve the medicinal plant wealth in Nigeria.

Key words: Indigenous knowledge, medicinal plants, Nigeria, local communities and conservation.

THE INDIGENOUS PATH

Indigenous knowledge or traditional knowledge refers to the long-standing traditions and practices of certain regional, indigenous or local communities. Indigenous knowledge also encompasses the wisdom, knowledge and teachings of these communities. In many cases, indigenous knowledge has been orally passed for generations from person to person. Some forms of traditional knowledge are expressed through stories, legends, folklore, rituals, songs, and even through the laws that shape that land (Acharya and Shrivastava, 2008).

Indigenous knowledge is characterized as cumulative, holistic, and practice-oriented; that is, it is not fragmented into categories or abstractions. Indigenous knowledge is place-based in that it is inseparably linked to a specific location. Indigenous systems of knowledge recognize the significance of other than rational modes of knowing such as visions, dreams, and intuition. Indigenous knowledge is expressed and transmitted through language (oral history, stories, songs, narratives, place names), social

organization, everyday and ceremonial practices, observation, values, institutions, and laws. The intergenerational accumulation and communication of knowledge is central in indigenous systems of knowing. It is mainly acquired by long-term direct observation and experience.

In many indigenous societies, women play a central role as keepers and teachers of knowledge. Women are often acquainted herbalists, ecologists, healers, and traditional seed custodians. Gender differences can also be found in ways of acquiring, preserving, and transmitting knowledge. Various types of indigenous scientific knowledge has been identified and employed, these include ethnoecology, ethnozoology, ethnopharmacology, ethnobotany, and agroforestry, most of which involve the use of plants or animals.

ETHANOBOTANY

Plants have been an integral part of life in many indigenous communities, and Africa is no exception (Sidigia et al., 1990). Apart from providing building materials, fodder, weapons and other commodities, plants are especially important as traditional medicines

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(Fratkin 1996, Akama 1999). Medicinal and aromatic plants have been an important resource for human health care from prehistoric times to the present day. Between 40,000 and 50,000 plant species are known to be used in traditional and modern medicine systems throughout the world (Leaman, 2004).

Approximately 25% of modern prescriptions medicines are plant-derived, these include drugs like vincristine, obtained from the Madagascar periwinkle (*Catharanthus roseus*), used in treating childhood leukemia and taxol, another cancer-fighting drug, obtained from the bark of the Pacific yew tree (*Taxus brevifolia*). In African countries, approximately 80% of the population uses traditional medicine for the treatment of various diseases and ailments like malaria, typhoid, ulcer, skin diseases, diabetes, reproductive problems, aches and pains for various socio-cultural & economic reasons (Ajose, 2007).

Historically, ethnobotanists focused on socio-cultural importance and economic relevance of these plants. These trends are rapidly merging in the face of both cultural and biological extinction. Ethnobotanists have begun to take a new position at the juncture between nature and culture, which in turn provides a unique view for accessing information important for conservation.

THE NIGERIAN SENARIO

Nigeria is rich in biodiversity. The country is endowed with a variety of plant and animal species. There are about 7, 895 plant species identified in 338 families and 2, 215 genera. There are 22, 000 vertebrates and invertebrates species. These species include about 20, 000 insects, about 1, 000 birds, about 1, 000 fishes, 247 mammals and 123 reptiles. Of these animals, about 0.14% is threatened, while 0.22% is endangered. About 1,489 species of microorganisms have also been identified. All of these animal and plant species occur in different numbers within the country's vegetation that range from the mangrove along the coast in the south to the Sahel in the north. Most of the biodiversity sustain the rural economy (Federal Republic of Nigeria, Fourth National Biodiversity Report, 2010).

In Nigeria, vast arrays of plant are traditionally used for the treatment of various ailments and diseases. These plants, mostly employed in a synergistic combination, have shown to be as effective, and are often preferred to the commercially available drugs by a larger portion of the society (Ajose, 2007). The vast chemical diversity of plants in bio-diverse regions such as Nigeria is a promising source of novel lead compounds that are still relatively unexplored. Thus the indigenous knowledge of traditional medicinal plants is a valuable tool for targeting potentially active species from the wealth of medicinal plants in these regions, which may be of great importance as new medicines. Over the years the importance of this traditional medicine has been

established. Nigerian researchers have spent much effort on the systematic identification, scientific evaluation and validation of Nigeria's medicinal aromatic plants, healing arts and systems. Some notable medicinal plants in tropical rainforest of Nigeria include African nutmeg (*Monodora myristica*), guinea pepper (*Xylopi eathiopicum*), lemon grass (*Cymbopogon citrallus*), sweet basil (*Cocimum gratisimum*), garlic (*Allum sativa*), ginger (*Zingiber officinale*), bitter leaf (*Vernonia amygdaline*), black pepper (*Gongronema latifolium*). Nigeria: First Biodiversity Report, 2001).

Major steps have also been taken by the Nigerian government to boost research into traditional medicine in an effort to preserve the country's indigenous medical knowledge. However, this increasing trend in the use of medicinal plants amongst both urban and rural dwellers has grave consequences on the survival of some plant species. This is because of the unsustainable manner in which many species are harvested. Furthermore, the downturn in the economy and inflationary trend has led to the excessive harvesting of non-timber forest products for various uses (Federal Republic of Nigeria, Fourth National Biodiversity Report, 2010). Some of these species are now threatened (Tables 1 and 2). Examples are *Hymenocardia acida*, *Kigelia africana*, and *Cassia nigricans*.

MEDICINAL PLANTS AND CONSERVATION

Medicinal plants are valuable species; they provide income and healthcare to thousands of people around the world. Greater numbers of people rely on traditional medicine, mostly based on herbs, for their primary healthcare than 'conventional' or western medicine. Medicinal flora has been the focus of much ethnobotanical research and also bio-prospecting over the years. This current and potential value of medicinal plants as traditional remedies and possible commercial pharmaceuticals is widely acknowledged through the large gamut of research centred on phytomedicine. However, efforts to understand the conservation needs of even the most important species of medicinal plants in these regions have received relatively little attention and support.

Surveys indicate that 80% of the continent's population relies on plant and animal based medicine to meet its health care requirements. For the most part the plants used in traditional medicine are collected from the wild, and in many cases, the demand exceeds the supply. Yet, plant conservation has long been overshadowed by conservation efforts directed towards animals, and has also been much divided among efforts focused on different production sectors that rely on plant resources – forestry, agriculture, non-wood forest products – and efforts targeting different types of ecosystems. Direct and coherent efforts to conserve plant species have received

Table 1. Threatened plant species in Nigeria.

Family	Number of threatened plant species	Family	Number of threatened plant species
Acanthaceae	26	Cucurbitacea	6
Adiantaceae	5	Cytheaceae	1
Agavaceae	2	Cyperaceae	21
Amarantaceae	1	Dennstaedtiaceae	1
Anacardiaceae	7	Dichapetalaceae	11
Annonaceae	15	Ebenaceae	7
Apocynaceae	19	Ericaceae	2
Araceae	3	Eriocaulaceae	3
Araliaceae	1	Euphorbiaceae	31
Aristolochiaceae	3	Flacourtiaceae	7
Asclepiadaceae	2	Gentianaceae	2
Aspidiaceae	7	Geraniaceae	1
Aspleniaceae	6	Gnetaceae	1
Athyriaceae	2	Goodeniaceae	1
Balsaminaceae	1	Graminae	19
Begoniaceae	2	Guttiferae	4
Boraginacea	4	Hymenophyllaceae	4
Burseraceae	1	Hypericaceae	3
Butomaceae	1	Icacinaceae	2
Caesalpiniaceae	13	Iridaceae	1
Capparidaceae	2	Labiatae	6
Caryophyllaceae	2	Lauraceae	2
Celastraceae	6	Lecythidaceae	2
Combretaceae	9	Lemnaceae	1
Commelinaceae	3	Lentibulariaceae	1
Compositae	36	Liliaceae	2
Connaraceae	6	Lobeliaceae	3
Convolvulaceae	3	Loganiaceae	4
Cruciferae	1	Lomariopsidaceae	2

Source: Federal Republic of Nigeria, Fourth National Biodiversity Report, 2010.

Table 2. Threatened Biodiversity Medicinal plant Species in Nigeria.

Species	Main uses	Status
<i>Masilania accuminata</i>	Medicinal	Endangered
<i>Garcina manni</i>	Medicinal	Endangered
<i>Oucunbaca aubrevillei</i>	Medicinal	Almost Extinct
<i>Erythrina senegalensis</i>	Medicine	Endangered
<i>Cassia nigricans</i>	Medicine	Endangered
<i>Nigella sativa</i>	Medicine	Endangered
<i>Hymenocardia acida</i>	Medicine	Endangered
<i>Kigelia Africana</i>	Medicine	Endangered

Source: Nigeria: First Biodiversity Report, 2001.

relatively little policy attention and research support (Leaman, 2004). Relatively few medicinal and aromatic

plants species are cultivated. The great majority is still provided by collection from the wild (Lange and

Schippmann, 1997, Srivastava et al., 1996).

This practice is likely to continue over the long term due to numerous factors; most medicinal plants are traded locally and regionally rather than internationally, the costs of domestication and cultivation are high, and land for cultivation of non-food crops is limited. Moreover, cultivation is not necessarily the most beneficial production system. Wild collection practices secure valuable income for many rural households, especially in developing countries like Africa (Schippmann *et al.*, 2002).

However, over-harvesting of medicinal and aromatic plants, land conversion, and habitat loss increasingly threaten a considerable portion of the world's medicinal and aromatic plants species and populations. For these reasons, approaches to wild medicinal and aromatic plants collection that balance the needs of local, regional, and international markets with the need for conservation and sustainable use are urgently needed.

Numerous international foundations, development agencies, and international agricultural research centers are also adding the power of their collective concern and resolve to deal with the circumstances leading to the loss of species. Among the influential documents now published are those by Abramovitz for the World Resources Institute, The Center for Our Common Future, the Consultative Group on International Agricultural Research, Hawkes for The World Bank, IUCN/UNEP/WWF, McNeely et al. for the International Union for Conservation of Nature and Natural Resources, the U.S. National Research Council, Britain's Overseas Development Administration, Sohmer and Knutsen for the U.S. Agency for International Development, and the Global Biodiversity Strategy: Policy-makers' Guide produced by the World Resources Institute, The World Conservation Union, and the United Nations Environment Programme.

The national policy on conservation and sustainable use of biological diversity is an integral part of the national policy on environment. The policy was first developed in 1989 following the promulgation of the Federal Environmental Protection Agency (FEPA) decree no 58 of 1988 and revised in 1999. The strategies have been designed to promote sustainable and adequate levels of funding and focus on integrated human development programmes, including income generation, increased local control of resources, strengthening of local institutions and capacity building including greater involvement of community-based and non-governmental organisations, as well as the lower tiers of government as delivery mechanisms.

Nigeria has also set up such centres, for example the Centre for Indigenous Knowledge in Farm and Infrastructure Management, Centre for Food and Agricultural Strategy, Centre for Indigenous Knowledge on Population Resource and Environmental Management, Yoruba Resource Centre for Indigenous

Knowledge and Centre for Urban and Regional Planning. In order to encourage the conservation of the medicinal plants there is a need for the collaboration and establishment of more national and local bodies dedicated to this conservation drive, to ensure the sustainability of these valuable plants.

PROACTIVE MEASURES

Prevention is always said to be better than cure, thus it is no shock to say that we need to begin to adopt proactive measures to ensure the sustainability of our medicinal plants. National and local bodies could be empowered to carry out inventories of native medicinal plants species and their conservation status, particularly those threatened by commercialisation and regional or international trade. The identification of important geographic areas for medicinal plant conservation and survey of the state of their conservation using the categories of threat would greatly provide a clear picture of the problem and allow the formulation of solutions. These bodies could also develop specific conservation strategies for medicinal plants in danger of extinction; encourage the local communities to be actively involved in conservation and management of medicinal plants. They could form collaboration networks focused on existing strengths and reinforce local initiatives. These bodies could also support pilot projects with local application to medicinal plant conservation, develop new legislations concerning trade could be put in place, start publicity campaigns to instruct the public about this issue and establish national seed or germplasm banks. Education could be used as a tool to facilitate these objectives. Ethnobotanists and related researchers could incorporate this aspect of conservation in their research agendas and bridge gaps between the masses and researchers by speaking to the authorities in local communities and the traditional healers. Incorporating such knowledge systems of promoting conservation into the curriculum of community education will find easy grassroots' acceptance as it is already rooted in their knowledge categories about the real world (Bisong and Andrew-Essien, 2007). This can help to augment the declining capacity of the traditional means of transmission of this knowledge due to universal primary education now operating in most newly-independent nations (Ruddle and Chesterfield, 1997).

Educative programmes could be conducted to inform communities of the wealth they process through this indigenous plants and how important conservation of this biodiversity is. Such education programmes are a vital complement to ethnobotanical projects and should be provided as a way of giving the community something in exchange (Linares et al., 1999). With these programmes people can be made aware of the importance of their natural resources and the need to preserve them through

sustainable management.

CONCLUSION

Without doubt Nigeria is richly endowed with diverse medicinal flora. These vital resources are presently threatened by overuse, lack of sustenance and intensified human development activities. It is therefore essential that we work towards conservation of this valuable plant resource, not just with the thought of preserving nature's bounty but for the well-being and livelihoods of indigenous local communities and the society at large, who depend on these resources. Though such conservation bodies exist, more efforts are required in taking these policies and conservation strategies to the local community. The aim of this paper to stimulate the government, non-governmental organisations, universities, researchers and students to adopt proactive measures and employ education as a tool in the sustenance of this knowledge and resource, through emphasizing the involvement of local communities as key players in the conservation process.

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