CHAPTER SEVEN:- BIODIVERSITY IN ETHIOPIA

- Ethiopia has over 6,000 species of vascular plant (with 625 endemic and 669 near-endemic species

- 860 avian species (16 endemic species and two endemic genera)

- 279 species of mammal (35 endemic species and six endemic genera)

- **There are a number of charismatic flagship species**

- most notably the gelada (an endemic genus and the world's only grazing primate),

- the mountain nyala (an Afrotropical tragelaphine antelope endemic to the Afroalpine ecosystem),

- the Ethiopian wolf (a palaeartic descent from a wolf-like ancestor that crossed into the Ethiopian highlands just over 100,000 years ago),

- the walia ibex (another palaeartic species confined to areas in the Simien Mountains) and the giant lobelia

- The large mammal populations cannot be compared with the wildlife spectacles of Kenya or Tanzania

- few countries have mammal population that can

However, there are remnant populations of

- elephant (an estimated 850,
- lions (an estimated 1,000) and large ungulates
- Spotted hyenas are abundant; indeed, they flourish and are largely tolerated in Ethiopia
- There is at least one and a possible further two isolated populations of black rhino

- The global biodiversity significance of the area has been recently recognized through Conservation International's Biodiversity Hotspots

- The country spans two Hotspots: the Horn of Africa (Friis, 2005) and the Ethiopian Highlands (Williams *et al.*, 2005)

- (which is included in the Eastern Afromontane Hotspot)

- The areas included in the Hotspots covers the majority of the country, including the entire eastern area of Ethiopia below 1,100m ASL and all highland areas above 1,100m ASL

- The Ethiopian Highlands have an estimated 5,200 vascular plant species

- Of these, 555 species (10.7% of the total) are endemics, with some groups, the majority of them associated with the open grasslands, dry woodlands and heaths, being very diverse

- Endemism among vertebrates, particularly at the generic level, is relatively high in this region, especially when one considers the mammals

- Thirty-one of the 193 mammal species in the Highlands are endemic to the area

- An estimated 680 species of bird are found in the Highlands

- and of these, 29 are endemic

- Most of the bird species that are endemic to the highlands are distributed widely

- The amphibian fauna includes six endemic genera (*Sylvacaecilia, Altiphrynoides, Spinophrynoides, Balebreviceps, Ericabatrachus* and *Paracassina*) and a high level of endemism at the species level (30 species, of a total of 71)

- The reptilian fauna is less interesting, although of the 58 species, 15 are endemic

- ✓ Only 64 fish species occur in Lake Tana and the other rivers draining the Ethiopian Highlands

- ✓ Lake Tana is the source of the Blue Nile and, with a surface area of over 3,000km^2, is the most prominent freshwater feature of the Ethiopian Highlands

- ✓ Nearly a quarter of fish are endemic to Lake Tana, including a loach *Nemacheilus abyssinicus* and 14 large cyprinids barbs

- ✓ *Barbus megastoma* is one of the largest of a number of important food fishes and it can grow to more than 80cm

Some other biodiversity aspects important for humans

- Medicinal plants. The formal medical sector plays a relatively limited role among rural communities in Ethiopia. Traditional medical practices are widespread and these draw primarily off plants. It has been estimated globally that 90% of rural communities depend on biodiversity for healthcare; this percentage is likely to be higher in Ethiopia

- Wild foods. Research has shown that wild foods play a role in food security: people incorporate wild foods into their diet as a buffer during food insecure periods. While research has formally collected data on wild plants that are used during such periods, a proposal to collect data on similar use of animals (across all taxa) is currently being developed. Fish are obviously an important source of food.

- Biomass fuel. The majority of Ethiopians use biomass for fuel. This primarily comes in the forms of dung, fuelwood or charcoal.

- Construction material. This comes in the form of timber and stems of trees or bamboo, and grass for thatching. Dung is also used for construction.

- Social and ceremonial use. Leather and skins from various species are used for clothing (e.g., lesser kudus are used for clothing by Mursi women) and ceremonial use (e.g., leopard and gelada skins in various ceremonies).

- **Knowledge Gaps**

- The number of species in all taxa recorded in Ethiopia has been steadily rising over the past 20 years, meaning that gaps in knowledge still remain. Ethiopia is a country where little systematic collecting has taken place, and many areas, particularly the forests of the southwest (where expeditions to date have been limited in duration and poorly equipped), are largely unexplored

- Ethiopia is a country rich in biodiversity, but poor in funding to protect these resources. The only way these gaps in knowledge will be filled in the near future, is to build partnerships between Ethiopian and foreign institutions.

Mandates

- The major problems facing protected areas need to be addressed by institutions at the appropriate scale, within clearly defined roles and responsibilities

- The first step in determining appropriate management responses is to clearly identify the problem being addressed

- According to Caldecott (1997), when the main threat to a protected area arises from cumulative overuse by too many people to meet their day-to-day subsistence needs, local regulation and social control may be required, along with investments in improved agricultural practices or alternative livelihoods

- However, government conservation institutions have taken the exclusive mandate to manage protected areas even though they lack adequate human, financial, and technical resource capacities to carry out this mandate effectively

- An over-emphasis on centralized protected area management over the years, under these circumstances has lead to undermined institutional mechanisms at local scales, e.g. traditional approaches to conservation based on local knowledge

- To counter this, the FDRE has implemented its decentralization policy

- Too much decentralization has led to passing over responsibility to institutions that have no capability to manage the protected areas effectively

- Another problem encountered, which has led to conflict has stemmed from some of the agencies going beyond their mandate

- Many of the institutions are not aware of the programs of the other institutions in the same sector, showing lack of collaboration and absence of network (Eg, EBI and WLC both for forest administration)

- EBI general about biodiversity

overlap

- WLC forest is wild life habitats

The role of NGOs and bilateral organizations

- Over the last 10 or so years, NGOs and bilateral organizations have increasingly played a critical role in protected area management across Africa

- There are a number of NGOs and bilateral organizations involved in activities related to protected area management in Ethiopia

- These include the Frankfurt Zoological Society, University of Oxford, CARE Ethiopia, the German Technical Cooperation (GTZ) and the Austrian Development Cooperation

- Some of these are involved in community conservation while others are working on ecosystem conservation in general or specifically on conservation of endangered species

- Some of them are trying to increase the conservation area for biodiversity through creating community awareness and skills building or contributing to the process of formalizing the protected area system of Ethiopia

- Basing on experience from other countries within Africa, NGOs can create partnerships with wildlife conservation agencies and are most effective in the following areas:

- community based conservation
- community based tourism development
- research and ecological monitoring
- ex-situ conservation especially of big mammals
- building capacity for protected area management through provision of technical assistance / training / skills building, provision of financial resources
- trans-boundary protected area management

ON FARM CONSERVATION

- In-situ conservation for agricultural diversit
- Continue conserving diversity on the farm, in its original place, where the characteristics evolved
- In the original site with the knowledge, the culture and the landscape
- Where the taxa developed their feature

- **Conservation in areas where domestic flora and fauna developed their characteristic features, i.e. in traditional farming systems**

- This is now called On-Farm Conservation

that has to date allowed the survival of the traditional crops with their diverse varieties in their natural settings with diseases and various

- In-situ conservation of ABD
  - Maintenance of:
    - Landraces/farmers' varieties/local varieties
    - Farming systems
  - Effects of growers practices
    - Little scientific information available
    - It is an emerging science
    - Involves systematic documentation & analysis of IK
    - Community participation
    - Education, extension
    - Development of environmental awareness
    - Benefits to the local communities

- **Initial concern of science was:**
- Ex-situ conservation in genebanks, botanic gardens, arboreta, field genebanks
- Then in-situ conservation started for wild organisms in their natural habitats
- For agricultural crops in-situ conservation was practiced for millennia by local farmers – now this is called in-situ conservation on-farm **On-Farm**

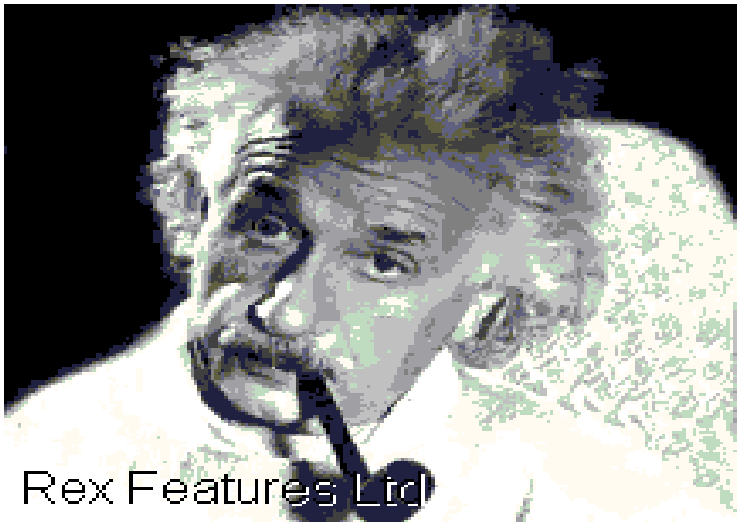
INDIGENOUS KNOWLEGDE FOR BIODIVERSITY CONSERVATION

"KNOWLEDGE is EXPERIENCE ,

EVRYTHING ELSE

IS INFORMATION"

Albert EINSTEIN



KNOWLEDGE

Knowledge (whether indigenous or non-indigenous) is associated with practical experience and skill in solving a particular problem while holding information does not necessary endow one with solving a particular problem.

INDIGENOUSE KNOWLEDGE

Indigenous Knowledge (IK) is the local knowledge. Knowledge that is unique to a given culture or society. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural resource management, and a host of other activities in rural communities. (Warren 1991).

Source: World Bank Bulletin

1998

WHY IS IK?

- **IK can provide problem solving strategies for local communities, especially the poor.**

- **Up to 2/3 of the world population depend on foods provided through IK of species and farming systems (RATI, 1994) e.g. 90% of food in sub-Saharan Africa is produced using customary farming system.**

- **Learning from IK can improve understanding of local**

- **Understanding IK can increase responsiveness to clients**

- **Building on local experiences, judgments and practices can increase the impact of a development program beyond cost effective delivery of stages**

- **Indigenous approach to development leads to sustainability creating sense of ownership.**

- **It can provide a building block for the empowerment of the poor.**

IK AND INNOVATION

- **Local innovation refers to the dynamics of indigenous knowledge, which is the knowledge that grows within a social group, incorporating learning from own experience over generations but also knowledge that was gained at some time from other sources but has been completely internalized within the local ways of thinking and doing.**

- **Local innovation is the process through which individuals or groups discover or develop new and better: ways of managing resources, building on and expanding the boundaries of their indigenous knowledge**

- **Successful local innovations often involve new ways of community organization, or new ways of stakeholder interaction**.

IK IN ETHIOPIA

- **Early Ethiopian Civilization serves as an evidence for the extent and rationality of indigenous knowledge**
- **The domestication of certain crops like coffee, teff and enset and the development of bench terrace system by the Konso nationalities are among important cases of achievements in agriculture**
- **When farmers in many parts of the world were still practicing the hoe-culture cultivation, the fact that the Ethiopian farmers designed and practiced the traditional plow is a living testimony to the inventive and innovative capacity of the traditional Ethiopia**
- **The country with written language for over 2000 years owns over 500 years old manuscripts, which deal with traditional knowledge concerning public health and veterinary medicine**

IK AND NATURAL RESOURCE MGT

- **The terrain of the Konso area of Gamugofa is mountainous and stony, causing many hundreds of kilometers of a highly developed dry stone contour bench terrace systems to develop, to enable sustained agriculture**

- **The earth is cut away to form a vertical face, against which a wall consisting of carefully selected stones, is built. Due to the steepness of the terrain, the terraces are generally level, narrow and high; often about 2.5 meters wide and 1.5 meters high.**

- **The Konso nationality has won a prize for its effective indigenous practices of water and soil conservation at the 50th Annversary of**
- **Random bench terracing :In Northeast Shewa and the Chercher mountains of Harerge,**
- **Contour Terraces of the Hararge Highlands**

IK AND HEALTH

- **If is estimated that over one-third of the world's population locks regular access to affordable essential drugs (UNCTAD, 2002)**

- **For these people, modern medicine is never likely to be a realistic treatment option. In contract, traditional medicine is widely available and affordable.**

- **Many local and traditional communities in Ethiopia conserve rare medicinal plants in home gardens**

- **They select and conserve specific species of plants whose medicinal values and properties they know. They domesticate these in small gardens normally at the back of their home steeds: like Dengetegna ,Kebericho and others.**

- **Partnership between herbalists and scientists is intializing of which their product is protected-e.g skin disease**

- **Documentation of medicinal plants is undertaken which can serve as basic database for networking-encouraging**

IK AND ETHNOVETERNARY

- **Being the leading country in Africa with its cattle population traditional animal husbandry and veterinary practices are widely practiced and provide a substantial animal health care.**

- **Due to inadequate modern veterinary services in Ethiopia and its inaccessibility in most parts of the country, large proportion of the country's livestock owners heavily depend on traditional healers and herbalists.**

- **The local practitioners of traditional veterinary medicine are the first contact of people even the modern veterinary care service is available.**

- **Traditional veterinary practices include Mechanical /Physical, Pharmacological, Surgical, Rituals and managerial methods of treatment. In Southern Ethiopia:**

- **Black /eg:- Cut open the infected part with knife and then brand the wound with a hot sickle.**

- **Pasteusellosis:- direct the smoke of burning eucalyptus leaves and of croton tree around the infected animal.**

Respecting Indigenous Knowledge

- Recognition of indigenous knowledge is the first step in the evaluation and selective use of such knowledge in biodiversity conversation programs

- Indigenous knowledge has been available to outsiders for some time, but until recently much of this information was largely ignored for a variety of reasons