



Figure 1. Map of Kenya showing the hilltop forests.

The hilltop forests

On these hills, precipitation increases with elevation, but temperature and evaporation decrease. This results in a relatively cooler and more suitable climate with a better developed vegetation of trees, shrubs and lianas on the hilltops, sometimes receiving annual rainfall in excess of 800 mm. These restricted hilltops, though geographically within the ASALs, are therefore climatically not arid or semi-arid and have mid-altitude forests with tree species of the lowlands and those of the uplands in addition to

those found in the ASALs. These are unique sites which are vital habitats to the long term maintenance of biodiversity and other natural processes in the ASALs.

These hilltop forests are of immense antiquity and the species of plants and animals in them have evolved mutual adaptation. On the other hand, the nomads have developed ecological management strategies in harmony with this fragile environment by exploiting different ecological niches. During normal seasons, grazing occurs on the lowland plains but with the onset of drought, animals gradually move to the hills. In this way the nomads have managed both wildlife and their habitats for decades.

The importance of the hilltop forests

During ethnobotanical field studies carried out by Kenya Forestry Research Institute (KEFRI 1991) in Kajiado District, it came out clearly that:

- a) Plant medicine use is still common and very popular, and held with a lot of esteem by the pastoralist communities in the ASALs, and in most cases people visit modern hospitals only when the traditional medicine fails.
- b) Most plants of use or value to the local community are now found only in the hilltop forests.
- c) The hilltop forests contain unique relic stands of plants and animals which have become endemic to specific hills as a result of isolation.
- d) The higher hills are water catchments, feeding springs vital for the very existence of life in the ASALs.

Threats to the Hilltop Forests

The ASALs are facing escalating environmental degradation and this degradation is extending to the hilltop forests within them, largely due to the rapidly increasing population and recurrent droughts. Due to the increasing human and livestock population and the effects of drought, the available soil, forests, water and grazing resources are under stress resulting in a wave of migration to the hills. In the past, pastoralists relied on livestock products but they are now changing to the consumption of grains and desire to grow their own crops. The change of land ownership from communal to individual accompanied by change from pastoral to sedentary life style poses an increasing threat to the fragile ecosystems of the ASALs (Herlocker 1979, Trapnell in prep.).

Research Priorities

There is an urgent need for concerted research to investigate the many issues involved in the environmental deterioration of the hilltop forests within the ASALs:

- a) Ethnobotanical surveys to identify plant species in the hilltop forests, their uses to the local community, and their abundance;
- b) Traditional extraction practices of herbal medicines, opportunities for domesticating species and development of harvesting protocols and sustainable production systems;
- c) Forest regeneration, wildlife and plant species, and provenance selection for various zones for better growth, survival and adaptation;
- d) Conservation and management of the existing hilltop forests, building on the valuable traditional management strategies.

Conclusion

All conservation initiatives for the hilltop forests must be people-focused and community-driven guided by socio-cultural studies undertaken within the frame work of strengthening and supporting the pastoral economy for which ASALs have an undisputed comparative advantage.

The local communities should be involved in the planning and management of the hilltop forests as opposed to the notion that forests in the ASALs, should be brought under the control of foresters through gazettelement.

The pastoralists must be educated in the rationale of conserving and where necessary, preserving the hilltop forests by deferring destructive exploitation today to meet the short-term needs in order to have long-term benefits tomorrow.

References

- Beentje, H.J., 1990. The Forests of Kenya. Proceedings XIIth Plenary Meeting of AETFAT, Hamburg.
- Greenway, P.J., 1993. A classification of the vegetation of East Africa. *Kirkia* 9: 1-68.
- KEFRI, 1991. A Dryland Forestry Handbook for Kenya. KEFRI, Nairobi.
- Herlocker, D., 1979. Vegetation of S.W. Marsabit District. IPAL Techn. Rep. D1 UNEP/MAB. Nairobi.
- Trapnell, C.G., in prep. Ecological Considerations in the Management of Indigenous Forests in South West Kenya.
- White, F., 1983. The Vegetation of Africa. Natural Resources Research 20. UNESCO, Paris.
- Waliaula, S.F.M., 1988. Plants of Baringo District. Technical report 178, Department of Resource Surveys and Remote Sensing (KREMU), Ministry of Planning and National Development, Nairobi.

Conservation priorities in the arid and semi-arid lands: the case of the hilltop forests of Kenya

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Abstract

The arid and semi-arid lands (ASALs) in Kenya are facing a serious environmental deterioration, largely due to the rapidly increasing population, overgrazing and changing lifestyles. This deterioration is being extended to the hilltop forests within the ASALs as people seek for livelihood in this "saviour sites". There is therefore urgent need for research into the array of issues in this crisis in order to be able to formulate viable conservation and development strategies. Effective conservation has to be broader based and firmly grounded and calls for the involvement of the local people as partners in conservation efforts since the hilltop forests are central to the rural culture.

Key words

Arid and semi-arid lands, Conservation, Hilltop forests, Kenya.

Introduction

There is little documented knowledge on endangered plant communities of Kenya, their geographical distribution, their abundance and their influence on the ecology (Waliaula 1988). This is exacerbated by the fact that literature on the forests of Kenya is rather scattered and piecemeal, and details about forest vegetation are absent in most cases (Beentje 1990). This situation is threatened further by the unprecedented rate at which the plants are being destroyed before their potential use to society and their ecological effects are discovered.

When forests decline or are removed, many forms of plants and animal life that depend on their habitat for survival are invariably lost. This is more serious in the Arid and Semi-Arid Lands (ASALs) where the plant genetic resources are threatened by recurrent droughts, migrating populations, overgrazing and changing lifestyles. These changes disregard traditional knowledge and practice of land use, natural resource management etc. developed by the local people over centuries resulting in serious environmental deterioration in the ASALs. This deterioration is being extended to the hilltop forests as people seek for livelihood in these "saviour" sites.

Physical environment

The ASALs of Kenya are generally characterized by a hot and dry climate. The skies are normally clear, and daytime temperatures may rise to 38°C. The annual rainfall is not only low but also brief and erratic, and ranges from less than 150 mm to 750 mm rendering this vast expanse of land agriculturally marginal. The most suitable land use is livestock husbandry and wildlife conservation, and almost 90% of the 40 gazetted national parks and game reserves are located in the ASALs. Extensive areas of the ASALs are low-lying plains covered by thorn bushes and scattered trees, mainly *Acacia* and *Commiphora* species (Greenway 1993, White 1983). These plains are however characterized by isolated hills and few mountains (Figure 1).

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