

AN OVERVIEW OF BAMBOO AND RATTAN SECTOR IN KENYA

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1.0 Introduction

There are about 150,000 hectares of bamboo forests in Kenya, partly pure and partly in mixture with trees and shrubs. Bamboo in Kenya play a very important role in fencing, house construction, water harvesting, cottage industries dealing with matchsticks, baskets, tooth-picks, various other handicrafts and, in agricultural farming especially for supporting horticultural crops.

Kenya does not have any substantial quantity of rattan to warrant in-depth discussion in the present summary. Much of the discussion will therefore be based on bamboo. It is apparent however that use of rattan is common in small scale especially in the production of basketry by groups supported externally and internally to provide employment opportunities especially to disabled people.

Planned and sustainable utilization of forests containing bamboo is feasible and no doubt would go a long way in providing self-employment and job opportunities to the rural population a part from being instrumental in bridging the gap between requirement and availability of indigenous raw-material for pulp and paper industry. The later use of bamboo has however not been developed, not only in Kenya but also in the entire Africa.

The sections that follow below provide an outline of the state of bamboo in Kenya, its present role and constraints that affect its development. Existing activities are outlined and the needs for bamboo development are suggested.

2.0 The State of Bamboo Sector

2.1 Conditions of the Resource Base

Bamboo in Kenya may be classified into six vegetation categories.

These include:

- bamboos with trees and shrubs
- bamboos with trees
- bamboos with shrubs
- pure bamboos
- shrubs with bamboos, and
- alpine vegetations, moorlands and bamboos

Distribution of bamboo vegetation types depend on the prevailing geographic and ecological conditions.

Over-time bamboo resource cover has undergone changes largely through clearing to provide clear areas for plantations, cultivation and settlement developments. The area under bamboo is therefore presently much smaller and, may be one-third of what was there by the third decade of this century. Much of the remaining bamboo is found on mountains, covering large areas in Mau, the Aberdares and Elgon mountains.

The bamboo resource on mountain areas are presently intact and their use is confined to areas bordering farming settlements. Much of use of natural bamboo is illegal with exception of small allowances provided to horticultural industry and by Government Departments. There exists therefore areas of disturbed stands next to settle areas.

2.2 Production and Cultivation

The bamboo resources in Kenya consist of indigenous *Arundinaria alpina* K. Schum and introduced (exotic) species. The indigenous bamboo species is mainly found in gazetted indigenous forests and small proportions are in farmlands. The following are the common bamboo species and, their production and cultivation status.

Arundinaria alpina K. Schum

The largest bamboo patches of the species are found in high altitude areas (2000m and above) such as Aberdares, Mau ranges, Mount Kenya and Mount Elgon. The amount available in farmlands is not known since inventory has not been undertaken.

A fully stocked stand of *A. alpina* is normally on average about 12,000 culms per hectare, and can produce 3,600 - 4,000 culms per hectare every 3 years.

Arundinaria alpina K. Schum can be raised through seeds and offsets. Viable seeds normally take a long time to be available and therefore seed is not reliable as a means of mass propagation. Only a small area can be annually planted using offsets.

Oxytenanthera abyssinica (A. Rich) Munro

This species was introduced in Kenya from Zimbabwe in 1954 and has been put in plantation at Muguga (2100m) where a mean annual rainfall of 970 mm and a mean monthly temperature of 16°C is experienced. The results from the trial indicated that young culms can attain a maximum height of 6.5 m after 2 – 3 months since planting and can produce an annual range of 14 - 28 tons air dry culms per hectare/year depending on previous years rainfall. Planting materials are better raised from seeds. Raising from cuttings is difficult.

Bambusa vulgaris Schrad ex Wendl

This species was introduced into Kenya from India many years ago and is widely distributed on farmlands and urban centres as ornamentals. The species is raised through cuttings and offsets.

Other exotic species

Over 20 other exotic bamboo species were introduced into the country during the last two decades, largely through the support of IDRC. Introduction of the species was done through cuttings, offsets and seeds. Fifteen species have successfully established in various ecological zones in the country. The successful species are *Bambusa bambos*, *Dendrocalamus strictus*, *Dendrocalamus hamiltonii*, *Dendrocalamus asper*, *Dendrocalamus membranacea*, *Bambusa tulda*, *Bambusa vulgaris* var *striata*, *Thyrsostachys siamensis*. These species are yet to be widely planted by farmers. Demonstration plots have been established at various ecological zones as part of bamboo promotion strategy.

2.3 Processing and Utilization

Utilization of bamboo in Kenya is still largely confined to domestic usage. In the highland areas where the resource is plentiful fencing and, house and food storage constructions are major consumers of bamboo. The later usage is done with minimal processing. This is the same case for bamboo used in the making of tea picking baskets.

On commercial scale bamboo has increasingly gained importance in flower farming industry where it has been used for support purposes. Its use in horticulture does not involve any substantial processing. To a large scale, but less documented, is the use of bamboo by farmers in the highlands to support pea farming. Other small-scale commercial use include production of toothpicks and small handicraft articles. Furniture making using bamboo is not a specialization in Kenya but the potential is there.

2.4 Markets for Bamboo and Bamboo products

Currently demand for bamboo raw materials is higher than the supply. The situation is mainly exacerbated by an existing presidential ban on cutting of bamboo in public natural forests. Recently cutting of smaller quantities to provide the needs of flower farming was allowed.

Marketing of raw materials has been largely influenced by the Forest Department that control the royalties of bamboo culms. The royalty prices are low and have not encouraged farmers' sale of their farm bamboo. The cutting ban has however resulted in local markets responding to demands and therefore market values which are generally higher than the government prices. This has provided incentives to farmers who have consequently maintained their bamboo clumps in farms, even next to public natural bamboo forests.

2.5 Socio-economic Characteristics of Bamboo Sector

The socio-economic impact of bamboo sector in the living standards of people is not widely felt. Only a few people are directly involved in the use of bamboo due to the ban on cutting of bamboo. Ever since the imposition of Presidential ban on exploitation of bamboos, hardly any bamboos find their way to the market in townships. Only a small fraction out of total number of requests for issue of cutting licences are entertained and authorised by the Conservator of Forests.

It will be interesting to assess the socio-economic role of bamboo used in the horticultural industry. Allowance for this use was made since four years ago. It is however notable that small uses by individuals for tea-picking basket making and tooth-pick cottage activities contribute to employment opportunities for the rural and peri-urban people.

2.6 Relevant Policy and Legislation

The policy on management and utilization of forest resources does not adequately address specific needs of the bamboo subsector. The forest policy (Forest Policy 1968) is restricted to development and utilization of major wood products besides recognizing the role of forests in environmental and water catchment protection.

There has been lack of rules on bamboo exploitation. This lack of rules resulted into wasteful harvesting and utilization of bamboo to the extent that a Presidential ban was imposed to protect further depletion of the resource. The imposition of the ban has restricted the use of bamboo to some selected users and government institutions. The ban has been a disincentive to the farmers in that they cannot freely harvest their bamboo and market their produce without interference from the government Inspectors.

The forest acts mention only about the regulation, sale and trade in major forest produce, timber poles and other products from the gazetted forests and is silent on forest produce on private lands. Bamboo is mentioned only as a minor forest produce and is allowed for sale or for free exploitation as livestock feed in some areas (The West Pokot Forest rules - Forest Act 385/Rev 1992). There are other legal instruments that are being used to control the exploitation of forest resources in gazetted forests, trust lands, private lands, such as Chief Authority Act, Cap 128 of 1970 (Revised 1988). These have indirectly or directly influenced the utilization and management of bamboo resources.

A proposed new forest policy, awaiting discussion by Parliament is more comprehensive and covers all aspects of forestry in gazetted forests, trust lands and even in private lands. The role of non-timber forest produce and the development of small scale forest enterprises is given prominence. This is expected to spur growth in development of bamboo subsector especially at the primary stages of processing and on-farm planting.

2.7 Constraints in the Sector

Socio-economic

- Limited land size due to pressure from the growing population in the high potential areas, while in the drier areas where land is available, moisture deficit and animal damage to bamboo are major constraints.
- Lack of capital to invest in bamboo processing machinery by the small bamboo entrepreneurs.
- Poorly developed market for bamboo products.
- Lack of modern skills of diversified utilization of bamboo.
- Inadequate awareness of the potential of bamboo in the development of local communities.

Technical

- The Forest managers lack the necessary skills for management especially harvesting and silvicultural operations. This leads to wasteful harvesting during operations in natural stands.
- Inadequate knowledge on the properties of the indigenous and introduced species. The full potentials of the resource have not therefore been realized.
- Lack of appropriate processing skills and technology. This has resulted in wasteful processing and inefficient utilization.
- Lack of cheap and cost effective methods of preservation to enhance durability of bamboo products.

Logistics

- Poor availability of operational tools and gears to enable effective surveillance of stands, fire outbreaks, efficient harvesting and processing.
- The bamboo cottage enterprise are not well organized.
- Inadequate capacity to control frequent bamboo fires
- Poor financial allocation to develop minor forest products.

Policy constraints

- Inadequate recognition of the importance of non-timber forest resources.
- The restriction of the movement of bamboo produce has been a disincentive to the farmers with bamboo on their private lands.
- Lack of clear rules on bamboo exploitation in gazetted forests.
- Continuous encroachment of natural forests for settlement.
- Unrationalized excision of natural forests comprising bamboo.
- Present ban on cutting of bamboos limits full utilization of Kenya's forest resources.
- Pricing policy does not enable returns by the producer and is not commensurate with the market prices.
- Lack of clear bamboo development goals both in natural and available vacant land.

3.0 Activities in Bamboo and Rattan Sector

3.1 Institutions Involved

A number of institutions are involved in various ways in the conservation and development of bamboo and rattan resources. Most of these do not however have well planned initiatives geared to the development of bamboo per se. The list below indicates the institutes' interventions in this sector.

- Forestry department, Ministry of Natural Resources is involved in the management and regulation of resource exploitation in the natural gazetted forests.
- Kenya Wildlife Service, Ministry of Natural Resources has the mandate of protecting forest resources and biodiversity in the National Parks and Reserves.
- Kenya Forestry Research Institute, Ministry of Research and Technology is a national forest research organization that undertake research in management and utilization of forest and tree resources, including bamboo and rattan resources.
- A number of small scale enterprises are involved in the utilization of bamboo and rattan resources for general handicraft and basketry production.

- Moi and Jomo Kenyatta Universities have undertaken research on bamboo in collaboration with KEFRI jointly and through students attachments.
- Winrock International (WI) and KEFRI have been jointly involved in projects and training activities geared towards enhancing the utilization and management of bamboo resources both in Kenya and IGAD region.
- International Union for Conservation of Nature (IUCN) - involved in research in collaboration with national institutions on utilization, management and conservation of natural resources where bamboo is major forest component.

3.2 Past and on-going Research Projects

A number of research activities have been carried out mainly with the leadership of KEFRI and with the support of IDRC and the Kenya Government. Other short-term activities have been supported through the Winrock International. Among the more notable projects includes:

- Bamboo introduction, species selection, field trials, propagation and management studies - The study was initiated in 1987 and is still on-going. Over twenty species from Asia and East Africa have been introduced and tried in several field sites.
- Bamboo propagation through tissue culture - This was a short-term project involving KEFRI, Jomo Kenyatta University and a local tissue culture company. Some three species (*Oxytenanthera abyssinica*, *Dendrocalamus strictus*, and *D. membranaceae*) were raised to the potting phase of seedling development. The Tissue Culture Services Company was left to continue with the initiatives and possible marketing of the materials.
- Vegetative propagation of local bamboos - A number of such studies have been carried out by KEFRI. Some of the studies have been carried out through attached students from Moi University, Jomo Kenyatta University and the Kenya Polytechnic.
- Effects of culm extraction on clump and shoot development is an on-going project in established stands of exotic species growing at several ecological regions. The experiment started in 1995.
- Training on bamboo resource assessment methodologies were conducted in two phases in 1993 and 1994. This was a KEFRI/WINROCK International initiatives.

3.3 On-going Development Projects

With the exceptional of small cottage activities that produce handicraft articles made from local bamboo and imported rattan the authors are not aware of a development project on the two forest commodities.

4.0 Needs Assessment

4.1 Strategic Research

There is lack of technical information particularly on the local bamboo resource, which should guide management, harvesting, marketing and utilization. Research should therefore be directed at:

- intensifying production from existing bamboo forests,
- expanding bamboo production to private farms, and
- improving and diversifying utilization of bamboo resources.

Research activities should therefore focus on

- developing comprehensive extraction techniques and harvesting regimes.
- developing techniques for restocking over-cleared bamboo areas.
- developing management practices in respect to harvesting regimes for various bamboo species under cultivation.
- improving knowledge on local bamboo properties to enhance diversification of utilization.

- developing effective bamboo treatment methods to increase period of usage.
- assessment of marketing dynamics as a feedback to investment in the bamboo industry.

4.2 Development Interventions

A number of interventions are needed to support the development of bamboo sector. Among the most critical should include:

- Creating awareness on the potential roles of bamboo sector in the development of local communities.
- Training of farmers, rural handicraftmen, and backyard cottage owners to improve skills and knowledge on bamboo harvesting, general utilization and processing.
- Developing a bamboo marketing system and improve local capacity to market farmer bamboo produce and processed products.
- Supporting transfer of appropriate technologies and information to enhance improved management, production and processing of bamboo resource and produce.

4.3 Changes in Policy and Legislation

Some policy issues and actions need to be addressed to ensure beneficial development of the bamboo sector in Kenya. Priority areas should include:

- Development of policy guidelines using developed technical information on the best ways to improve bamboo production, utilization and marketing strategies.
- Lifting the ban on cutting of bamboo to achieve full utilization and improve the welfare of local communities.
- To adopt a proper pricing policy based on a series of market studies.
- To develop a land use plan that consider bamboo resource as an important management commodity.

5.0 Conclusions and Recommendation

- There is vast expanse of bamboo forests in Kenya which is presently underutilised. There is no good reason why these should not be utilized.
- It is apparent that the bamboo can play an important role in the development of the country's economy and especially the rural economy by generating entrepreneurship and employment. The potential has however not been recognised.
- A number of socio-economic, technical, logistical and policy issues and problems will need however need to be addressed to support the bamboo development, especially in the establishment of small-scale and cottage industries.
- It is therefore recommended that support for action on research and development needs proposed in Section 4 above is provided.

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