

**Entrepreneurship development of timber and non-timber
forest products**

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Introduction

Forest resources can be classified into timber and non-timber forest products (NTFP) and play an important role in the livelihood support by providing essential food and nutrition, medicines, fodder and other domestic requirements to rural populations and urban consumers. Non-timber forest products are defined as goods of biological origin excluding industrial timber or pulp, derived from forests, other wooded lands and trees outside forests. This term includes small products made from ligneous (woody) material, such as wooden stools, masks, drums or other handcrafted items (Koppell, 1995).

Some of the NTFP that contribute to sustainable livelihoods include gums and resins, honey, essential oils, frankincense, myrrh, fibres, medicinal and aromatic plants, dying and tanning materials. In economic terms, NTFP contribute substantially to national economic growth and international trade. According to a survey on production and marketing of NTFP in Kenya carried out by Vomigel Ltd (KAFU, 2000, Oduor, N. *et. al*, 2002), about USD 40 million is generated annually. In times of drought and food scarcity, some NTFP are the only source of nutrition for the rural communities.

Commercial opportunities for timber and NTFP are emerging throughout the world as economic liberalisation is opening new markets and governmental decentralisation and democratisation is enabling communities to have a greater role in the management of forest resources. However, the issue of sustainable production is important in this value chain. Sustainable NTFP and timber based enterprises are those, unlike other enterprises that increase the welfare of the local people (social sustainability) by creating sustainable economic activities (economic sustainability) while safe guarding the environment in the long run (ecological sustainability) [Wollenberg E. and A. Ingles, 1998]

How do we set up a successful enterprise?

The Market Analysis and Development (MA&D) approach (Lecup I. et al, 2000) assists people to achieve a sustainable livelihood system in which their household and community assets are increased and local forest management is improved. It enables local people to identify potential products and develop markets that will provide income and benefits without degrading the resource base.

Market Analysis and Development (MA&D) provides a framework for planning tree and forest product enterprises. It is a step-by-step process, arranged in three phases, and it uses a series of general tools that have been, or can be, adapted to achieve specific results in the development of business ideas. MA&D is an innovative process that systematically considers social and environmental concerns alongside the technological, commercial and financial aspects of enterprise development.

The following are the three phases in the MA&D process.

Phase 1: Assess the existing situation. Understand the issues; define the problems and opportunities, and shortlist a range of products.

Phase 2: Identify products, markets and means of marketing. Decide on the best products and gather information for their further development.

Phase 3: Plan enterprises for sustainable development. Formulate an enterprise development plan and prepare for implementation.

The phases have the following steps:

The MA&D process

PHASE 1 Assess the existing situation

STEP 1 Identify the target group

STEP 2 Determine the financial objectives of the target group

STEP 3 List existing resources and products

STEP 4 Identify key constraints of the existing market system

STEP 5 Shortlist a range of products

STEP 6 Raise awareness of the benefits of working together

Outputs

- A shortlist of products that will be evaluated in the next phase of MA&D
- Understanding of the social, environmental and technical constraints of a range of products
- Formation of a team of target group members to undertake Phase 2

PHASE 2 Identify products, markets and means of marketing

STEP 1 Analyse the four areas of enterprise development

STEP 2 Select the most promising products

STEP 3 Create interest groups for the selected products

Outputs

- Identification of the most promising products and collection of information for the design of business plans
- Formation of interest groups for the selected products
- Formation of a team of target group members to undertake Phase 3

PHASE 3 Plan enterprises for sustainable development

STEP 1 Examine the business environment of the selected products/enterprise

STEP 2 Define the enterprise mission, goals and objectives

STEP 3 Develop strategies in each of the four areas of enterprise development

STEP 4 Formulate the action plans to implement the strategies

STEP 5 Calculate financial projections for the enterprise

STEP 6 Obtain financing as specified in the capital needs statement of the financial plan

STEP 7 Initiate the pilot phase and training

STEP 8 Monitor progress and deal with change

Outputs

- Formulation of an enterprise strategy for the selected products
- Development of an action plan
- Financing, as specified in the capital needs statement
- Implementation of a monitoring and planning system

Kenyan's forest resources

The Forest Sector plays vital roles in the livelihood of the Kenyan population through provision of invaluable forest related goods and services. The most significant contribution is in the energy supply for domestic and industrial processes, provision of timber for construction and trees for regulation of water flow. It is estimated that 80% of the population use biomass energy while urban development and hydro energy rely heavily on water. Forests

will continue to provide essential goods and services such as timber, poles, fuel-wood, food, medicines, fodder and other non-wood forest products. Forest resources and forestry development activities also contribute significantly to the national economy by supplying raw materials for industrial use and creating substantial employment opportunities and livelihoods.

Kenya covers an area of 582,646 km². According to recent statistics Kenya has a total of more than 17 million ha of land covered in all types of forests. This translates into some 30% of land covered forest vegetation. However, much of this is savannah and bushland. It is estimated that Kenya has closed canopy forest cover of less than 3% of its land area.

In the early 1900's it was realised that indigenous forests in Kenya had slow growth rate when compared to some exotic species introduced in the country. The idea of establishing exotic plantations was therefore suggested and the first systematic planting programme was undertaken in 1907-1911. Species grown then were mainly *Eucalyptus* spp and *Acacia mearnsii* and were intended for the supply of firewood for the Ugandan railway.

By the middle of the century, the annual target of the planting programme was 2430 ha of exotic conifers i.e. *Cupressus lusitanica*, *Pinus patula* and *Pinus radiata* was achieved. In 1955 the Forest Plantation Working plans Officer raised the annual target to 4800 ha. The plan recommended planting of exotic softwood conifers and exotic broadleaves in the ratio of 6:1. The established plantations were to serve as a means of controlling soil erosion and restore important water catchment in addition to supplying timber and fuelwood.

At Kenya's independence in 1963, the government target was set at 136,000 ha of timber plantation and 24,000 ha of pulpwood plantations to be achieved by 1980. With the assistance of the loans from World Bank in 1969 and 1975, this target was reached. By 1989 the total plantation area was about 165,000 ha. By then, the major species were *Pinus* spp (59,000), *Cypress* (73,000), *Eucalyptus* (15,800) and indigenous species (15,700).

Kenya is internationally considered to be a Low Forest Cover country as it has less than 10% of its total land area classified as forest. The Government is putting in place measures to significantly increase the area under forest cover, with the aim of attaining at least 10% within the next decade. To attain this level of forest cover, the Government is promoting farm forestry, intensifying dryland forest management, involving the private sector in the management of

industrial plantations and also promoting community participation in forest management and conservation.

It is through these efforts that enterprises of various forest products – both timber and NTFP, have been established. This paper gives a few examples of some of these enterprises in the Kenya.

Timber products enterprises

Wood is the main source of domestic energy for cooking for 90% of the rural people and urban poor in Africa. Wood-fuel demand far exceeds supply resulting in continued destruction of the natural forests and environmental degradation. Most of the timber in the country is obtained from industrial plantations; however, after the ban on harvesting from gazetted forests, timber is being imported from neighbouring countries and also being sourced from private farms. This has caused an increase in farm-grown wood where we are having subsistence farmers developing trees as a major cash crop. Idle land in the semi arid areas of the country is being turned to productive use as farmers grow trees, not just for the traditional purposes of providing household firewood and building materials, but as a durable source of income.

The catalyst of this new interest in tree farming is a project that has introduced trees bio-engineered to mature quickly in parched areas without excessively shading the food crops with which they are inter-planted. Cuttings of the cloned trees and improved tree seedlings are sold to farmers at an affordable price of 10-20 US cents.

Monica Nyawira, a farmer and mother of five children, is among those who have benefited. Three years ago, Nyawira planted her one hectare farm, scenically sited near the slopes of Mt. Kenya, with just cabbages for the local market and French beans for export. Since she learned about farming biotech trees, her family fortunes have improved. Having intercropped her French beans and other vegetables with the trees, Nyawira earned US\$600 in February when the Kenyan electric company bought some of them to be used as distribution poles.

The District Forest Officer Joram Umwa reported that Nyawira is one of hundreds of farmers who have earned a combined 3.9 million Kenyan shillings (US\$50,000) in Kirinyaga District in the last two months from the sale of biotech trees. He added that residents have stopped

encroaching on Mt. Kenya forests because they have their own trees that they use for constructing houses, as firewood and as a source of income.

The biotech trees are crucial to Africa because the continent's growing population is triggering a rise in demand for firewood, building materials and forest-derived products such as paper. Hence the need to encourage the farming of trees that mature quickly. After two years, the new trees can be used for thatch and mounting honey beehives; at three years they make good firewood and charcoal, and at four years they are ready to be used as building poles. These trees have superior grains that reduce splitting of sawn timber and grow uniformly thus reducing logging costs.

Non-timber Forest Products enterprises

The NTFP are many and can highlight a few of the potential enterprises developed.

The *Mondia whytei* (mukombela) and *Ocimum kilimandscharicum* enterprise

Mondia whytei, is a medicinal liana that grows in Kakamega Forest, a rainforest in western Kenya. Studies by McGeoch (2004) have shown that plants are most dense in indigenous forest managed by the Forest Department, and tallest in indigenous forest managed by the Kenya Wildlife Service; thus indicating that management may have important impacts on the wild *M. whytei* population. Qualitative data indicated that harvesting may be responsible for reproductive decline (McGeoch L. 2004), and that sustainable harvesting systems or harvesting alternatives may assist wild *M. whytei* populations.

An on-farm cultivation of the species was initiated by KEFRI (Kenya Forestry Research Institute) in collaboration with ICIPE in 2000 to generate income (for the communities) and conserve the wild *M. whytei* populations growing in the forest. More than 500 members of the forest-adjacent communities around Kakamega Forest have now been trained in *Mondia whytei* cultivation, and 40,000 plants of *M. whytei* are now growing in rural homesteads.

The local perceptions on the root is that it is an appetizer, increases milk production in mothers and cattle, sexual stimulant, use for stomach aches and stomach worms.

Its biochemical studies indicate it is a flavoring agent, an anti-gonorrhoeal activity; it is high in vitamins and minerals and is a valuable animal fodder (leaves). It is gained recent national and international recognition



Monarda whytei climber



Sale of *Monarda whytei* root

Another medicinal plant from Kakamega forest *Ocimum kilimandscharicum* (Labiatae) was formerly traditionally harvested unsustainably from the forest for treatment of colds and flu, diarrhoea, abdominal pains and measles. It has also been used for repelling mosquitoes and for protecting stored grain. This plant has shown outstanding properties in acting as an insect repellent and in reducing the biting rates of *Anopheles gambiae*, a major malaria vector, when used as a fumigant for rural households.

Today, however, around 200 farmers cultivate *O.kilimandsharicum* for hydrodistillation into an extract used in the manufacture of ‘Naturub’, a commercial natural product now on sale in more than 62 outlets in Kenya. It matures within 6 months and is harvested after every 3 months without replanting *Ocimum* farmers earn about US\$ 300 per acre per year, a higher rate of return than from maize, beans and tea, estimated at US\$ 231, \$83 and \$245, respectively (http://www.icipe.org/arh_2004_5/16-EH-BioPros.pdf). The *Ocimum* flowers are an excellent source of nectar for honeybees.



Framers cultivating *O. kilimandsharicum*

The development of these enterprises has resulted in reduced pressure on forest herbal medicine while providing alternative income to the local community. Candidate medicinal plants for on-farm cultivation and commercialization were selected on the basis of their product effectiveness, toxicity, propagation potential as well as product market evaluation. Extensive agronomic studies accompanied the selection process.

Aloe products enterprise

For many years, hundreds of tonnes of aloe products from Kenya have been illegally feeding the global multi-billion-dollar pharmaceutical and cosmetic industry. Now, for the first time, aloes will be leaving Kenya through the front door. The European Union has funded a Sh10.5 million aloe processing factory at Koriema in the Baringo District, to tap the raw material available in the area and beyond in Samburu. The Baringo Bioenterprise, will convert wastelands into a veritable gold mine. About 67 % of the land in Baringo and Koibatek is semi-arid and can only support a few drought resistant subsistence crops such as sorghum. This is the first project of its kind in the country and will be run by KEFRI, Landmawe Investor and the residents of Baringo District. KEFRI has played a leading role in aloe research in Kenya since 1997 and is currently studying both exotic and indigenous aloes.

The project is aimed at wealth and job creation and biodiversity conservation. A resource survey and mapping will be done before domestication and marketing of the product is begun. The products, marketed as Baringo Aloe, will compete with others like Cape Aloe of South Africa. Currently, South Africa accounts for 600 of the 1,000 metric tonnes traded in the world annually.

Aloe gel is said to have a market worth US20 billion, most of it controlled by the United States of America. Aloe extracts are used in the manufactures of drugs, cosmetics and a health drink produced by Golden Products in Southern Africa (Golden Life Aloe Vera-plus). Aloe has been used throughout the ages to cure headaches, stomach upsets and many other ailments. Aloe varieties in Kenya are traditionally used for the treatment of burns and cuts, acne and skin disorder, stomach upsets, hair restoration and skin rejuvenation.

Aloe has become the new goddess of beauty and health, but because of smuggling, it is impossible to estimate how much is produced in Kenya. According to Rajeev Wason of

Rosin Kenya Limited, about 1,000 metric tones of aloe gel are produced in the semi arid parts of the country annually. These areas include parts of Samburu, Marsabit, Moyale, Wajir, Baringo and Kajiado Districts.

Aloe trade is restricted under the Convention on International Trade in Endangered Species (CITES), but limited supplies have found their way to China and the Middle East in the processed form. Harvesting in Kenya, by labour hired from pastoral nomadic communities who are paid a pittance, is often done crudely, with little regard for the survival of the plant.

The KWS has now developed draft guidelines on the issuing of CITES permits for aloe domestication. KEFRI has identified commercial indigenous aloes and developed propagation protocols. KEFRI envisages that by the year 2020, Kenya drylands will have adopted aloes as a cash crop to serve as an alternative source of income and wealth.

In the Baringo and Koibatek areas, farmers are already strategizing on how to benefit from the new project. For example, Jane Chepkonga's 20 acre farm at Ngoswet in Mogotio, is currently covered by Acacia, *Leleshua* (*Tarchonanthus camphoratus*) and other hardy shrubs of insignificant value. She is converting her entire farm to aloe *secundiflora*. She has also diversified into bee farming as the flowers of the fleshy aloes attract bees and has since harvested some honey.



Flowering *Aloe secundiflora* growing in the wild

Gum Arabic enterprise

Gum arabic is an exudate of *Acacia senegal* and other *Acacia* species and is the most extensively used of the natural exudates. Its first reported uses, about 3000 BC, were as an adhesive in hieroglyphic paints and in the embalming of Egyptian mummies. The main producing countries are Sudan, Nigeria, Senegal and Mauritania; however none refine the gum to food commercial quality. The market price of high-quality refined gum arabic, USD 15-25 per kg, is 8 to 10 times the price paid for the crude exudate. From wild species, gum yield per tree varies from 20 to 2000g per year. Yields, consistency and profitability are significantly improved by integrated systematic selection, cultivation, tapping and processing. *Acacia* trees can be cultivated in plantations and the gum can be processed and refined locally.

Coincident spray drying encapsulates flavour, spice oils and oleoresins to produce dry particles suitable as ingredients of dry soup, sauce, dessert and cake mixes. Its gels form the bases of many varieties of pastilles, gum drops, jelly candies, cough lozenges and other confections high in sucrose. It acts as a stabilizer in marshmallows, caramels and nougats; as a protective coating for nuts and a glaze for baked bread and cakes; in toppings and icings for cakes; and foam on beer. It is extensively used as an emulsion stabilizer and binder in a wide assortment of lotions, emollient creams, and other cosmetics and also soft drinks.

The Acacia Operation Project funded by FAO is hosted at KEFRI. The project goal is to improve livelihoods of communities living in Kenya's drylands by combating desertification through sustainable land use management and utilization of natural resources. In short the project is establishing plantations of these *Acacia* species so as to produce gum Arabic for local consumption and for export market. They have collaborating with other NGOs/CBOs to have the product branded and processed for export market. Training in gum Arabic and resins production, primary quality control and marketing has been carried out in 8 Districts in the 18 months of the projects existence.

Conclusions

Timber and NTFP-based enterprise development is a feasible as well as a desirable strategy for increasing rural incomes from community forestry. In order to have timber and NTFP-based enterprise development, sustainable community forest management incorporating the conservation and commercial utilization of potential products is necessary as a pre-condition.

Successful enterprises and sectors based on timber and non-wood forest resources and products show a pattern: most involve local incentives, clear rights governing forest use, healthy local institutions and links with stable markets. Emphasis on quality products is also a factor for success. Local processing can increase returns through value added, while tapping local knowledge can enhance the production and processing as well as the marketability of products. A key to success in NWFP enterprises lies in adding value to the non-wood resource through local processing, which returns a greater portion of the final price to the people who manage the resource. Local processing can preserve items, reduce post-harvest losses and enable the product to reach more distant markets. According to Talyor (1999) five points for successful enterprises are:

- ***Support communities through clear land tenure and policy support.*** Where local groups are well organized and can control forest access, rural enterprises tend to fare better. A clear sense of group identity, cooperative behaviour and established rights to the resource can all help.
- ***Start with local markets.*** Local markets are easier to enter and monitor than foreign markets, which often require heavy capital investment and large product volume and which tend to be vulnerable to product substitution. Enterprises may diversify to larger markets if such diversification is feasible in terms of sustainable harvests, product quality and investment requirements.
- ***Focus on quality products and building management and entrepreneurial skills.*** These elements can be supported through coalitions involving local partners, local and national NGOs and international technical organizations.
- ***Support NWFP enterprises through policies facilitating credit and trade.*** Coherent government policies that support NWFP enterprises are needed, including mechanisms to make credit more available to small enterprises (such as the recognition of stands of

commercial tree species as collateral) and the removal of counterproductive price controls. To inspire policy-makers to support rural enterprises with a coherent policy framework, FAO has proposed better accounting of the economic importance of NWFPs, including a system for grouping NWFP trade statistics within existing commodity classification systems.

- ***Make the most of local knowledge and resources.*** Maintaining cultural integrity remains an underappreciated element of forest sustainability, particularly in remote communities and upland areas. Researchers in silviculture, marketing and processing should consider the best available knowledge from traditional as well as scientific sources to optimize forest management and the contribution of NWFPs to the lives of rural people.

For all types of forestry, whether plantations or natural forests managed for timber or other products, sustainability of the resource can be achieved through the following steps according to guidelines of FAO 1998:

- **maintaining the harvest of all products at sustainable levels by:** careful control of harvesting levels, timing and frequency; minimizing damage through harvesting residual stock; and monitoring and feedback into silvicultural management;
- **maintaining essential ecosystem processes by:** retaining continuous vegetation cover; returning nutrients to the soil (e.g. through in-forest debarking and conversion); minimizing soil compaction by the careful use of light machinery and animals; maintaining watercourse patterns; and careful control of chemical use;
- **maintaining biological diversity at ecosystem, species and gene levels by:** adopting multispecies/variety/clone systems wherever feasible; incorporating secondary succession as far as possible, rather than treating it as a weed problem; and integrated pest management;
- **satisfying the needs of people living in and around the forest by:** involving local people at all stages in forest boundary definition, planning, management, harvesting and monitoring of the forest, and forest product processing; employing local people; compensating for foregone rights and privileges; providing access and usufruct rights; providing recreation facilities; ensuring landscape and cultural compatibility;
- **ensuring economic sustainability:** on the part of the *forest user*, through investing in processes that minimize external inputs of materials and energy, recycle and reduce

waste and, especially, turn 'waste' into products; and through investment in forestry research, species/provenance selection and breeding; and on the part of *governments*, through creating conditions that will ensure that forest users stay in business but do not reap an excessive portion of forest rent.

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