

FARM Africa and SOS Sahel International/ UK Participatory Forest Management Programme (PFMP)



COMMERCIALIZATION OF MEDICINAL TREES IN BONGA

(PROJECT PROFILE)

The Goal of PFMP is to ensure environmental sustainability through Community based natural resource management systems



A PRIVATE RURAL DEVELOPMENT & AGRICULTURAL EXTENSION AGENCY
A Public-Private-Rural Community partnership
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INTRODUCTION

The Bonga Forest site has attracted several studies and generated great interest in Non Timber Forest Products (NTFPs). This interest is a result of recommendations made from a number of studies indicating the economic potential of multiple species of NTFPs found in the region. Included in the category of NTFPs are medicinal trees that are found in abundance, but have not been commercially exploited to benefit the population living in and around the forest. In recent years, FARM Africa has been advancing a participatory forest management approach that brings the local government and the community together to put in place a system where the community would directly manage the forest and benefit from the judicious and sustainable exploitation of trees and their by products while being accountable to the protection and conservation of the forest. Farmers are so appreciative of their natural forest that they proudly express that everything they need is extracted from the forest with one exception – salt. The main purpose of this project is to domesticate the production of selected medicinal trees, process and package it for domestic, regional and global trade.

Project Rationale

About 23 trees/shrubs have been named (by the local population) that have medicinal properties and being used independently or mixed with other products. Out of these, six (*Hagenia abyssinica*, *Myrsine memanophloeos*, *Myrsine africana*, *Croton macrostachyus*, *Phytolacca dodecandra* and *Embelia schimpri*) are used in one from or another to treat tapeworm. *Ekbergia capensis* and *Olea capensis* are used to treat abdominal cramps. The list goes on that roots, leaves, stems and barks of a number of tree species are used to treat skin disease, wounds, malaria, venereal disease, common cold and coughs, lung troubles and asthma. For this project, the consultancy team selected two commonly occurring tree species that can be domesticated for medicinal value as well as for other multiple uses including timber and fuelwood. These two species are: 1) ***Prunus africana* (tikur inchet, omo)** and 2) ***Hagenia abyssinica* (kosso)**. The team would like to stress that there are a multitude of trees and shrubs in Bonga forest that have medicinal properties but have not been investigated in this study. The team strongly recommends that more investigation be made to other species to identify the degree of their importance and use/marketability as Ethiopian traditional medicines. The investigation should be carried out as a follow up to a study made earlier in which 23 species have been named by the local population to be very useful for curing ailments. This team focuses only on two species that it considers have strong domestic (mainly *Kosso*) and global demand.

Prunus africana is selected mainly for its regional and global market whose demand is increasing in a significant way over the last decade to manufacture drugs from it to treat prostate enlargements/cancer. There is at present an African Task Force to promote the domestication of the species to expand its importance into a highly demanded marketable product, produced and packaged in large quantity for economies of scale. Ethiopia is in the Task Force

represented by EARO/FRC. In spite of its global importance and demand as a major medicinal ingredient for prostate cancer, farmers in Bonga use the tree mainly for fuelwood and charcoal production. This project will have the objective of introducing the tree as a high value medicinal tree by starting a pilot *Prunus africana* processing plant from where samples will be shipped to pharmaceuticals in East Africa (mainly Kenya and Accra) for testing and subsequent commercialization.

Hagenia abyssinica

The koso tree (*Hagenia abyssinica*) is selected because it is widely known and used in the country as traditional medicine. The inflorescence (with seeds) enters the traditional medicine market in towns and cities as it is widely used against tapeworm, widely prevalent in Ethiopia due to the culture of eating raw meat. The koso tree is an on-farm agroforestry tree with an excellent timber quality resembling rosewood timber in the wood industry. Its demand in the timber industry both in the country and outside is high. However, the supply to the market is very negligible and no longer supplied to the timber industry in the country. Although koso is proved to treat tapeworm very effectively, the product has not been commercialized to enter the formal pharmaceutical industry, hence curtailing the economic importance of the tree. With abundant koso trees in the Bonga Forest, the potential for manufacturing tablets from the koso seeds is so high that a partnership of the public/research institute and a private sector is ideal to initiate a koso enterprise. There is a 20 ha government Kosso plantation at Sobra in the Bonga and Melegawa PAs. A recent survey estimated that there are about 788,000 adult koso trees in the Bonga Forest Site (Mateos Ersado, 2001).



Picture 1: Kosso one of the medicinal and timber tree in Bonga forest

Project Objectives

The project will have dual objectives:

- Promote in-situ conservation and sustainable utilization of the two species
- Commercially grow these species using proper growing techniques
- Process and package the product to attract domestic, regional and global market

SPECIFIC ACTIVITIES

- Germplasm selection
- Seed supply and Nursery development
- Provide skills to enable PFM communities and private sector to participate in medicinal trees farming/business enterprise
- Improve Harvesting and handling techniques
- Study of Market research and information of products
- Identify training needs and support services

EXPECTED OUTPUTS

- In-situ sites selected and protected for germplasm sources
- Supply of Seed and seedling system established
- Training program in place
- Management and utilization of existing stock and establishment of new supplies increased
- Market for products improved and developed
- Policy issues harmonized vis-à-vis existing protection laws

STRATEGY

- FARM Africa to plan and hold a planning workshop in Bonga with major stakeholders to agree on the strategy and development protocols
- Establish working groups for medicinal trees
- Develop an elaborated project design document
- Determine an institution and site for medicinal trees R & D
- Carry out more investigation on the potential of other indigenous and/or traditional Ethiopian medicinal plants (thesis research recommended)

PROJECT SITE

Bonga town, and specific PFM field sites that represent ecological ranges of the species (Minimum two sites for each species)

BENEFICIARIES

- PFM groups (sale of products, food security through enhanced income)
- Local communities
- Private sectors (investment opportunities)
- Local government (enhanced revenues)

IMPLEMENTING PARTNERS

- Farm Africa
- SuPAK
- IBCR
- EARO

- Agriculture & Natural resources Office (Region, Zone, Woreda)
- Jimma University (College of Agriculture)
- PFM Coops.
- Private sectors

DURATION

- Phase I (1-3 years)
 - Planning and Project development
 - Initiate field implementation (R & D sites) and Pilot work
- Phase II (3-6 years)
 - Project Implementation

INDICATIVE BUDGET (Birr 1, 700, 000)

Phase I	Birr 0.5 million
Phase II	Birr 0.7, million

Source of funding: EU, TICADIII (Japan), SuPAK (Netherlands Govt.) World Bank, GEF, DFID and other donors

THE NEXT STEP FOR FARM AFRICA

This enterprise development will take time. It may be justified as a project activity under *in-situ conservation* in partnership with the PFM Groups/Associations being formed and the FARM Africa and its partners. It is possible that the organized communities will begin planting these species under a project support program, especially, supply of seed/seedling and technical support. Market research and development needs to be undertaken early in the project planning and implementation stage both for medicine and for the timber in the case of the *Omo* and *Kosso*.

The knowledge base for these two species within the community and Project/government staff is low and this needs to be rectified through the provision of technical material and introductory training on their germplasm, nursery and field care and management. This can be followed by training on utilization and marketing for these and other valuable medicinal trees and woody perennials in the **dega** and **woina dega** AEZs of Kaffa Zone.

The World Bank or similar donor can assist in sending out key Ethiopians to see the sector in India and China as well as to Kenya with a view of designing the project and program. The small group could include representative from the Chamber of Commerce, Ministry of Health, Ethiopian Science and Technology, EARO, and from the Private Pharmaceutical Industry. Senior staff can represent FARM Africa from the Bonga field office that will eventually spearhead further project preparation and implementation through FARM Africa.

The potential for exploiting a number of trees and shrubs (in Bonga forest) as a source of traditional medicine is very high. However, not much has been done on this sub-sector by research and development agencies although interest is growing in both public and private sectors. FARM Africa should take the initiation to coordinate such interest and transform it into field activity generating high value medicinal products from indigenous Ethiopian trees, shrubs and plants.

APPENDIX 1: THE OMO TREE (*Prunus africana*) IN BONGA: ITS DOMESTICATION & POTENTIAL TRADE

1. INTRODUCTION & BACKGROUND

Botanical Name: *Prunus africana* (*Pygeum africana*) Rosaceae family

Common Names:

English: The African Plum, The African Cherry, The African Prune, Red stinkwood or African stinkwood, Bitter almond, Iron wood

Local: Omo, Tikur inchet (meaning blackwood)

1.1 Geography and Extent

The Omo tree is indigenous to tropical Africa including Ethiopia. Its concentration is from Ethiopia to South Africa (East, Central and Southern Africa) as a regional block. But it is also common in West Africa, especially in Cameroon and Angola. Madagascar is also an important country for the Omo tree. In Ethiopia, it had a large geographical distribution including the Central and Northern Ethiopian highlands, the Eastern (Chercher) highlands and the Southern and Southwestern Ethiopian highlands.

1.2 Land Use and Land cover in the Kaffa Zone

As the Omo tree is a component species of the natural forest cover, a land use/cover map has been prepared showing the current distribution of the forest cover and other natural vegetation types (ANR Desk/SUPAK, 2003). According to this map, the highland forest area of Kaffa Zone (> 1,500 msl) is 257,000 ha or 33% of the land area of the Kaffa Zone. The Omo tree is a major component species of these forests. This forest cover (broad-leaved highland forest) is half of its original distribution in the highland here in the region (now 49% compared to 90% originally). The Saja area and the adjacent Boginda Forest have high concentration of Omo trees but one notes the existence of many dead or dying trees. The Omo tree is competing its fruiting season now (February) and the ground is littered with seeds whose pulp has been eaten by birds.

The Omo tree is now mainly confined to the southwestern region of Ethiopia with the Kaffa Zone (including the Bonga forest site) showing a large concentration of the species. There are now an estimated 764,000 adult trees in the Bonga forest (with DBH of 2.6-7.5 cm), according to a recent

forest inventory work (Matias Ersador, 2001) and height of 40 m or more. It is an upper story species along with few other tree species such as *Olea*

welwitschi, *Shefflera abyssininca*, *Celtis africana*, *Euphorbia obvalifolia*, *Croton macrostachys*, *Albizia achimperi*, *Syzygium guineense* and *Polyscias fulva*. The altitudinal (climatic) range of Omo is widely common in altitudes from 1930 to 2950 m (Mateos Ersado, 2001). It is however more common and associated with the Dega AEZ

1.3 Description and Natural Regeneration of Omo tree

1.3.1 Description of the Omo tree and Traditional Uses

Omo is an evergreen tall tree up to 40 m or more with open high foliage, open branches, often pendulous. Its high canopy and not so dense (straight bole and clear of branches to 15-17 m), makes the tree a good candidate for agroforestry practices (see botanical illustration showing major tree characteristics). In the Bonga forest, the tree is often hit by lightening. Such trees once hit by lightening are not touched by farmers and local residents for fear of evil spirits be falling on them too. So the tree is allowed to die and eventually decay on location.

The use of Omo is thus limited to fuelwood and charcoal making from healthy trees. The wood is hard to split and only a small amount is used in construction of houses. Other uses of Omo tree known and enjoyed in other regions of Ethiopia are not known the Kaffa Zone including Bonga.

1.3.2 Regeneration & Propagation

Natural regeneration through wildlings is believed to be poor but farmers do not give adequate reason. The fruit is eaten by wild life and this is the main means of natural regeneration and distribution. The seeds, once germinated, need open sun and moist soil to initially grow fast. It is generally thought to be a slow growing tree in wild. Remove the pulp by soaking for 24 hrs, then wash over a wire mesh. Spread in a thin layer in an airy shaded place to dry--but for 4 hrs only. Do not store seeds for long as it is not an orthodox seed it is believed to be a recalcitrant, that is, sensitive to drying). Sow fresh seeds, once dry or before they are dry. Moist leaves around the seed minimize moisture loss during temporary storage and transport. Seeds stored for 1 year had germination rate of only 35%. FRC offers seed in its Seed Catalogue as well as government Seed Centers in Tanzania and Kenya. These sources give 5,000 seeds/kg but no germination percentage or instruction on how to deal with the seed other than stating that the seed needs no pr-treatment.

1.3.3 Pollination and Fruit Set

Trees produce flowers with male and female parts. Insects pollinate the flowers that will lead to good fruit set. Fruit take 4-6 months to ripe and are then sought after by birds and monkeys who help disbursement and natural regeneration in the forest area, especially where there is forest canopy gap.

2. MANAGEMENT AND UTILIZATION

2.1 Basic Silvicultural Management

The Omo tree has only been commercially utilized by debarking the existing trees in the wild especially in Cameroon, Madagascar, Tanzania and Kenya. There has been some plantation establishment of Omo tree in Kenya. In Ethiopia, there is no experience in planting and managing omo as an economic tree, even for timber and multi-purpose tree in the past. National and regional interest to cultivate Prunus is only 2 to 3 years old. ICRAF (The World Agroforestry Center) has an active program of Trees and Markets program where the propagation of Prunus has been given importance. FRC and IBCRI have an on-going interest on the propagation and commercialization of Prunus.

2.2 Agroforestry Potential

Prunus has been known in traditional medicine (not in Bonga) and for its hard timber qualities to make farm tools and household utensils and in minor constructions. It appears to respond well to cultivation as seen in landscaping programs where it is planted as an attractive garden shade and specimen tree. In natural forests and enrichment plantings, it will continue to be an important source of food for birds and other wildlife. The leaves serve as fodder for domestic animals.

The tree can be used in land reclamation, amenity, erosion control (when trees are grown along contour ridges and terraces), shade and shelter, acts a windbreak. ICRAF believes that more Prunus growing under agroforestry systems will ease pressure on the natural forests. The first priority for ICRAF and IPGRI is to find ways to extend the shelf (storage) life of the seed and to improve reproduction through cuttings, which is possible.

2.3 Bark harvesting

Despite the multiple uses of *Prunus* cited above, the extraction (harvesting) of the stem bark will continue to be the major market product. *Prunus* is said to have remarkable ability to withstand bark removal. Sustainable bark harvesting means and entails taking only small patches of bark at a time, giving the tree time to recover before further harvest. Bark should only be removed from opposing sides (quarters) of the trunk, starting a "cutlass length" above the ground, and that 4-5 years should elapse before the trees are debarked again. This way, it is possible to save the trees and still harvest highly valuable market product, the bark. How to harvest the bark over many years is shown involving four steps (see diagram from a leaflet by ICRAF).

2.4 Marketing and Trade of *Prunus africana* Bark

Reports indicate that about 300 tons of barks are exploited per year in Cameroon and Madagascar, the two important exporting countries in the past. When harvested sustainably, each batch of bark amounts to 55 kg (120 lbs.), which currently returns USD 10 to 20 to the harvester. When completely stripped, a large tree may yield up to one metric ton of bark worth USD 200, a one-year's income of many Africa's rural poor farmers.

The bark is currently priced at USD 220 million from an annual average harvest of 3,500 tons, fetching up to \$60 per kg from 35,000 debarked trees. Currently, the whole brk of 40 m tall tree can earn as much as \$500. In Kenya the bark is sold at \$2/kg and less in Cameroon. One can only guess how much the 764,000 standing adult trees in Bonga are worth and nothing is being done. Certainly, the newly formed PFM groups such as the Wacha Forest Group can address this issue. Harvesting and replanting or establishing plantation of *Prunus* could be reflected in the long-term plans.

3 UTILIZATION OF STANDING STOCK AND PANTING PROGRAM

There are three issues in the utilization and enhanced production and marketing in the Bonga Forest for FARM Africa, the local government and local population (especially those who have formed Associations/Unions through the PFM process, namely:

1. The knowledge base on *Prunus* (Omo) - that is, its use, production and market is very low,
2. There is no institutional home yet for Medicinal trees in Bonga yet
3. There is no clear policy of utilization of such a tree that is currently in the **List of Protected Trees**

Therefore, this supplementary technical information has been prepared for FARM Africa to prepare a development agenda to formulate a full-scale program aimed at removing the obstacles listed above. The World Agroforestry Center (ICRAF), through its Ethiopia Country Program office, the FRC, and IBCR should form the first Task Group to workout the next stage. The new Trees On-Farm Network of ASARECA, co-hosted by ICRAF needs to participate, if not use this as one entry program in Ethiopia. Ato Shimelis of FRC is currently a member of the Technical Committee overseeing the network's implementation and development process. New programs that can be interested to fund and provide technical assistance include, (AFTREECA (Trees for Africa's Children, and (b) New Trees for Africa, both supported the Government of Japan. TAM Agribusiness is also an active member of the NETWORK.

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