APICULTURE and Agroforestry Development in the Miombos, western Tanzania.

by

Mr. Remen Swai  ICRAF Representative Tanzania and Dr. Peter Allan Oduol,
Agroforestry Consultant. SADC/ICRAF P.O. Box 1595 Tabora.

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1. Background information

Tanzania International Centre for Research on Agroforestry (ICRAF) Agroforestry
Research Project started in Tabora in 1986 and in Shinyanga in 1991. This was
in response to the massive environmental degradation due to deforestation
efforts that were geared to the eradication of tse tse flies and quelea quelea birds
in Shinyanga Region and for tobacco curing in Tabora Region. The other
problems were declining soil fertility and shortage of dry season fodder for
domestic animals.

The original project had only research as a component and dissemination was
included as a component in 1997. The project had the responsibility of
developing viable and appropriate agroforestry technologies for improvement of
soil fertility, fuelwood, fodder, fencing and indigenous fruits.

This Tanzania project is part of the Southern Africa Development Community
(SADC) and the World Agroforestry Centre (ICRAF) Agroforestry project for
Sustainable Rural Development in the Zambezi Basin’, which started in 1996 up
to March 2001 (Phase I) was funded by CIDA. The Project covers Malawi,
Tanzania, Zambia, Zimbabwe and Mozambique. The purpose of this project was
to: implement and integrate agroforestry technologies into smallholder farms in
core extension areas in the region; increase the ability of core country national
agencies to manage agroforestry technologies; develop and disseminate new
agroforestry technologies; and increase national and regional capacity for integrated land-use planning and management.

A Phase II of the project commenced on April 1 2001 and will end on March 31, 2006. The goal of Phase II is to improve living standards of small scale, resource poor farmers by increasing agricultural production and conserving the environment through scaling up adoption of agroforestry technologies and innovations in the Zambezi Basin.

2. Agroforestry
Agroforestry combines agriculture and forestry technologies to create integrated more diverse, productive, profitable, healthy and sustainable land use systems. Agroforestry practices include: rotational woodlots, improved falls, fodder banks, alley cropping, boundary planting, forest farming, riparian forest buffers, silvopasture, windbreaks, and others.

3. Location
The project previously was located in two regions at Lubaga centre, 4 km from Shinyanga Town Shinyanga Region and Tumbi Agricultural Research Institute 16 km from Tabora town along Tabora-Urambo road. The SADC/ICRAF Project is currently based in Tabora and Shinyanga Regions of Tanzania. The project main office is located at the Zonal Irrigation Office, Kilimatinde road in Tabora Town and sub-field office at The Agricultural Research Institute (ARI) Tumbi 16 km from Tabora town along Tabora-Urambo road.

4. Implementation
The project is implemented in Shinyanga and Tabora Regions by ICRAF, in collaboration with Ministry of Natural Resources and Tourism through Tanzania Forestry Research Institute, Tabora Centre and Ministry of Agriculture and Food
security through the Agricultural Research and Development Institute, Tumbi, other partners include World Vision Tanzania, TAWLAE, ATTT, District councils.

The project focal areas for scaling up in Tanzania are Uyui (Tabora rural), Nzega and Igunga districts in Tabora Region, and Shinyanga rural in Shinyanga Region.

5. Project goal and Purpose.
The goal of the project is to reach farming families in Tanzania with agroforestry technologies in order to improve food security, eradicate rural poverty and enhance environmental resilience in the region. The purpose is “scale up” to increase the adoption of diversified and improved agroforestry solutions to reach a much wider group of resource poor farmers with a particular emphasis on women farmers at least (40%). The project works directly with farmers and policy makers, in addition the project pursues strategies which “scale out” agroforestry adoption by training, supporting and networking with partner organizations that undertake complementary work on their own, through:

- Creating sustainable networks for dissemination of agroforestry innovations and linking with others working on HIV/AIDS, gender, water and education throughout the region;
- Improving the policy framework for adoption of agroforestry;
- Improving farmer experimentation and participation in agroforestry development, with a special focus on involving women;
- Create sustainable seed delivery systems for agroforestry; and
- Improving the marketing of agroforestry products and services so that greater socio-economic benefits can be derived.

It is anticipated that this will lead to the adoption of agroforestry practices by at least 100,000 farmers across Tanzania by the end of this project period in 2006.
6. Project achievements/highlights

- The most widespread innovation of rotational woodlot technology using indigenous and Australian acacias has been widely accepted in Tanzania where woodlands were decimated in the past to eradicate tsetse flies and quelea quelea birds, especially in the Shinyanga Region, and for tobacco curing in Tabora Region. So far nearly 5,000 farmers have adopted this innovation. Flue cured tobacco remains a major cash crop in Tabora Region and many farmers in Tanzania, are looking for alternative wood sources. We anticipate that another 50,000 farmers will adopt and use this innovation by 2004.

- The second most widespread innovation has been improved fallows with nitrogen-fixing leguminous trees, such as *Sesbania sesban* and *Giricidia sepium* intercropped with maize to improve soil fertility and maize yields in Tabora and parts of Shinyanga in Tanzania. The project is working with farmers and partners to expand the adoption of this innovation.

- The fodder bank technology based on supplementary feeding has been well accepted in Shinyanga rural where projects like dairy development have been encouraging farmers to adopt. This technology is well suited to small-scale dairy farmers who have improved breeds of dairy cattle provided by projects like Heifer International and other NGOs. In Tanzania many dairy development projects have mushroomed as dairy is seen as a strategic pathway to alleviate poverty, overcome malnutrition and improve soil fertility. The potential for adoption is great around peri-urban areas, and already hundreds of farmers are benefiting from this innovation around Tabora and Shinyanga in Tanzania. We expect a lot more farmers to be involved in this technology in Tanzania.

- The domestication and commercialization of indigenous fruits and medicinal trees should be seen as an emerging industry for Tanzania with the highest diversity of indigenous fruits. These fruits are edible and rich in sugars and
vitamins. They are already sold on roadside markets and a few, like “Amarula” from South Africa, have international market. The current number of farmers who are processing indigenous fruits into products like, jam juice and wine and planting these fruit trees is still small. The strategy is to domesticate these along with the popular exotics like improved mangoes, guavas, passion fruits and oranges, then to embark on post harvest and processing by training women and other local entrepreneurs in product development and marketing.

In this way we will be contributing to food security, poverty alleviation and conserving biodiversity. This component has direct relevance to nutrition and HIV/AIDS as well as empowerment of women and development of entrepreneurship at community level. We expect at least 10,000 farmers will plant these fruit trees in Tanzania by 2004. We also expect that National Bureau of Standards will certify a few products and some of these products will be sold for the first time in supermarkets in the region.

- Seed demand and supply projections, production and distribution. Seed is a critical factor in scaling up of the above agroforestry innovations. The next step in ensuring that seed is available will be to identify farmers' seed-production methods and evaluate the more efficient methods, and to set up seed orchards of the different species in Tanzania. We will use existing research stations, commercial farmers, at the same time, encouraging local small scale farmers to produce seed as a business. We anticipate at least 50 ha of seed orchards of different species will be planted in the first 2 years of this project, in Tanzania.

7. Beekeeping and Agroforestry (Apiculture)

The goal is to increase people’s awareness of the vital role of bees in agriculture and natural environment. The objective is to relocate bee keeping and bee hives from the forests to farmers fields.
8. Bee keeping in the miombos

Beekeeping has been practised for a long time in the miombos in crude forms. Hazardous experienced by bee keepers include, uncontrolled wild fires, falling from trees, wild animals, stinging by bees and other insects, predation by wild animals. However, there is need to develop beekeeping as it is especially suitable for people in rural areas in the low income bracket.

9. Biology of honeybees

Understanding the relationship between bees and plants is crucial to human use of bees. Honeybees are very efficient pollinators of flowers and crops. Farmers in developing countries have found increased yields after placing beehives near their fields. Claims "the honey bee is directly or indirectly responsible for 80% of the worlds food supply"

10. Apiculture practice of beekeeping

It is possible to manage beehives at a very low level of technological and capital input. Their cosmopolitan distribution, multipurpose nature and relative simplicity in management combine to make bees a natural agricultural supplement for many types of farm system in developing countries

11. Importance for beekeeping:

- Bees play an important role in the pollination of many flowering plants such as beans, melons, maize and fruit trees, thus improving crop yields.
- Bee products, that are honey and wax, can be sold to generate income.
- The nutritional value of bee products (honey, pollen and propolis) is very high and can be used to supplement the diets of the people, especially children, sugar diabetic sufferers and those doing a lot of manual work and need readily convertible source of energy.
- Both honey and beeswax are valued for their medicinal use in traditional cultures. Apitherapy," or the use of bee products for health and healing, is
growing in the world market. Apitherapy products include natural bee pollen, raw propolis, fresh royal jelly (currently selling for US $70-$100 per kilogram), and bee venom (currently selling for over $100 per gram in China). These are used to treat skin conditions, viral infections, rheumatological conditions, and cardiovascular and pulmonary conditions among others.

- The honey bee does not compete for resources with other agricultural enterprises. A beekeeper at a subsistence level does not have to own land to produce a cash crop as bees collect their food in wild, cultivated and wasteland areas.
- Beekeeping can be practised in areas of little agricultural value and can be integrated with other agricultural activities such as crop, livestock farming and Agroforestry.
- Beekeeping can be initiated by either individuals or groups. It requires little capital and minimal dependence on foreign technology.
- Bees play an important role in the ecosystem of forests and natural resources.
- Beekeeping diversifies agriculture and provides employment opportunities for people in the rural and urban areas.
- Conservation of biodiversity through agroforestry and beekeeping

12. Beekeeping and development
Several NGO’s are working with bees for development and are helping people in poor and remote areas of the world to use bees to improve their standard of living. You don’t have to own land; you don’t need spare time available to find income from bees. The possibility of food production from beekeeping, along side other activities, make beekeeping an excellent and worthwhile practice to promote.
13. Beekeeping women and development

Integrating apiculture with women cooperatives and community groups, is a means of empowering the female economic situation in many traditional cultures. Focus on women beekeeping

14. Multipurpose Tropical Trees and Shrubs for Bees

If you are wondering if your current agroforestry system will benefit from and support bees, look at these examples of tropical agroforestry trees and shrubs that all provide nectar for bees. The improved pollination by the bees enhances production of seeds or fruits of these plants as well:

*Acacia confusa, Acacia holosericea, Albizia adianthifolia, Alblizia chinensis*  
*Albizia lebbeck, Albizia saman, Azadirachta indica (neem), Cajanus cajan* (pigeon pea), *Calliandra calothyrsus (calliandra), Cassia spectabilis (golden shower tree), Citrus species (citrus trees), Cocos nucifera (coconut), Eucalyptus species (eucalyptus), Dalbergia sissoo (rosewood), Gliricidia sepium, Gmelina arborea (white beech), Grevillea robusta (silk oak), Hibiscus rosa-sinensis (hibiscus), Inga vera (inga, ice cream bean), Mangifera indica (mango), Melia azedarach (chinaberry), Morus nigra (mulberry), Pimenta dioica (allspice), Pithecellobium dulce (Manila tamarind), Prosopis species (kiawe, etc.), *Psidium guajava (guava), Sesbania sesban (sesban), Syzygium cumini (java plum), Brachystegia speciformis, Julbernadia, Sclerocarya birrea*, *Strychnos cocculoides, Parinari curatellifolia, Vitex mombassae, Flacourtia indica, Vitex doniana, Berchemia discolor, Terminalia sericea, Albizia anthelmintica, Turraea fischeri, Securidaca longipedunculata, Zahna africana, Entanda abysinica, Cassia abbreviata, Entadophragma bussei, Combretum zeyheri, Zanthoxylum chalybeum* and *T. Sericea*

15. Promotion of apiculture on farmers’ fields by ICRAF

- Conduct Participatory Rural Appraisal (PRA) to find out problems faced by beekeepers
• Introduction of top-bar hive technology
• Training in improved harvesting and processing to improve quality and diversify production
• Market facilitation to assist farmers sell honey
• Development of agroforestry and community forestry by establishing nurseries, community forests, to enhance bee forage availability and reduce environmental degradation.