Case Study 2: Restoring the Vegetation and Improving the Livelihood of the Kamba and Maasai People in Kenya

Background

The Akamba people are found in south eastern Kenya while the Maasai are found mostly in southern Kenya. The region is characterized by low, unreliable and erratic rainfall. It has two rainfall seasons of march – May (with a mean of 200-300 mm) and October – December (with a mean of 250–460 mm). Evapo-transpiration is high ranging from 1550 – 2500 mm per year.

Most of the land is between 500 – 1000 m in altitude with a number of hills some reaching 1600 m above sea level. The mean temperatures range from 16 – 30^{O}C. The soils are medium-textured ferrasols with the dominant type being moderately deep chromic luvisols. The vegetation is mainly dry woodlands and bushlands. The area has medium to low potential for plant growth.

Over the last 100 years or so the region has continued to attract more people and especially during the last 50 years despite the fact that the region ranges from dry sub-humid to largely semi-arid in ecological conditions. This pressure has led to continued degradation of vegetation and soils.

Due to the evident degradation of the natural resources in the region, the Government of Kenya entered into a partnership with the governments of Japan and Belgium to undertake a natural resource rehabilitation programme for the region. Rehabilitation of forest and tree resources was identified as a priority. Two Ukambani Districts (Kitui and Makueni) and one division of neighbouring Kajiado District; the later largely occupied by the Maasai people, were identified as the focal areas of attention. Two formulation missions carried out in 1985 and 1995 found that the region experienced low farm income and inadequate food supply at household level because of various constraints. But, before a framework of development interventions was formulated, it was realized that the available technical tools and capacity for rehabilitation were inadequate. It was agreed that these shortcomings be addressed before a comprehensive rehabilitation action plan was adopted. The three governments, therefore, came up with a programme to perfect the tools of rehabilitation with the following objectives in focus:

- to improve capacity of extension service and farmers in dryland forest rehabilitation;
- to establish methods of seedling management and tree establishment;
- to establish restoration possibilities for degraded woodlands, soils and soil moisture regimes;
- to select, develop and promote high value timber and food trees to fit into alternative livelihood commodity development options; and
- to develop a social forestry extension model for arid and semi-arid areas.

A Social Forestry Training and Rehabilitation project for Semi Arid Areas [SOFEM] was thus initiated in 1985, in Kitui District and an Agroforestry project for Integrated Research and Development in Semi Arid Areas of Kenya [ARIDSAK] in Makueni and Kajiado Districts in 1997. Both projects have adopted integrated and multi-disciplinary approaches involving all the stakeholders in the planning and implementation process. SOFEM has Kenya Forestry Research Institute [KEFRI], Forest Department [FD] staff and Japanese International Co-operation Agency [JICA] experts as subject matters specialists working closely with selected core farmers, local groups and schools representing beneficiaries. ARIDSAK has KEFRI, KARI and staff from line Ministries of Environment and Natural Resources [Forest and Water Departments] and Agriculture and Rural Development providing subject matter specialists and selected farmers, local groups or schools representing beneficiaries. The project uses research and development approach at on-station where technologies are developed and tested by subject matter specialists. Promising technologies are verified further under farmers' conditions. Proven technologies are packaged in the form of extension materials for use by extension staff and farmers within the project area. Through this approach, neighbouring farmers benefit through learning experiences of the core contact farmers.

Other avenues for demonstration include greening and conservation of selected earth dams to reduce siltation. Meanwhile, capacity building through training has been a major activity of the two projects. A wide range of outputs have been realised.

Results and Lessons Learned

Capacity Building in Dryland Forestry

Courses on social forestry for dry areas, especially focussing on farmers and extension frontline service have been conducted. Some 1400 national participants were trained on tree nursery techniques and management, tree establishment, protection and use by 1997.

In addition to the national courses, regional courses on social forestry were conducted covering dryland tree technologies, extension methodologies, policy formulation to promote social forestry in drylands and the role of forestry in enhancing conservation and mitigating desertification in the Eastern and Southern Africa region. Angola, Botswana, Burundi, Eritrea, Ethiopia, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe and the host Kenya are the regular participants of the Regional Social Forestry for drylands training course. 20 participants from the region are trained annually and to date some 160 participants have trained in the social forestry course. Of the 5 weeks duration for the course, the regional participants spend 2 weeks in the project districts to be exposed on the lessons and experiences in tree and environmental rehabilitation of drylands.

On-Farm Tree Planting and Extension Methodologies

Seedling propagation and management

22 commercial and 32 domestic small-scale nurseries have been promoted in the three districts of Ukambani and Maasai (Kitui, Makueni and neighbouring Kajiado) respectively. 70% of these nurseries are managed by women groups while the remaining 30% by groups comprising both women and men. The focus of promotion of tree nurseries were propagation and raising of seedlings, tree planting in farms, and income generating opportunities.

Nursery activities were promoted for ten years (1985-1995). Five years (2000) since the ceasing of formal intervention, an evaluation was carried out, which revealed that although 25% of the contact groups stopped nursery activities, some 18% new groups had taken up nursery activities and there were more individuals, some who were part of the fall out groups, that had taken up to tree small-scale nursery activities. But what was more interesting is the fact that the estimated total annual seedling production by small-scale nurseries had changed from 550,000 (1993) to a total of 1,245,000 (2000). In addition, among the seven income generating activities of the women and combined groups, tree nursery activities moved from a general sixth position to third or fourth positions in importance. Groups and individual nursery owners within the R & D farms in Kitui and especially Makueni Districts have made income from sale of seedlings ranging between US$ 900-2500 per year. The higher earners, especially individual nursery owners, got more income through sale of seedlings of grafted mangoes and in few cases citrus, which fetches two to three times the price of ungrafted seedlings.

Tree Establishment and Management

Several methods were proposed for use by farmers to enhance establishment of tree seedlings under dryland conditions. The main constraint in dryland forestry practice is inadequacy of moisture to ensure establishment of seedlings. Four water conservation/ harvesting methods have been widely tested and an evaluation of this effort indicated that the use of soil structures to concentrate water to the seedlings has been commonly adopted by over 40% of tree growing farmers. Use of terracottem, which has also been promoted proved to be expensive for the small-scale farmers. Where water is available, the recommended watering regimes and schedules are used almost by all the tree growing farmers.

Promotion of High Value Timber and Fruit Trees

In addition to use of trees in rehabilitating degraded vegetation and lands, a deliberate effort was made to select high value trees as incentive to tree planting. Such trees included *Melia volkensii* (indigenous, fast growing tree, which is resistant to termite), *Dalbergia melanoxylon* (an indigenous slow growing but highly valued for wood carving), *Terminalia brownii* (indigenous and favoured for its good form and resistance to termite), *Senna siamea* (exotic and prioritized for its fast growth and therefore quick provision of fuelwood), *Mangifera indica* (a fruit tree that has become successful), and *Citrus sinensis* (for its adaptability and fruits). It has not been possible to get the proper total area cover of these species. It is however estimated roughly that during the last 5 or so years, *M. volkensii* has gained a collective area cover of about 50 ha, 5 ha for *D. melanoxylon*, 5 ha for *S. siamea*, 3 ha for *T. brownii* and over 60 ha for *M. indica*. The cover of the target timber and fruit tree species is likely to increase since the mood of tree planting is high due to the promotional lobbying done by the projects.

Natural Restoration of Degraded Woodlands

Due to over exploitation of woodlands and especially overgrazing, charcoal production and firewood collection, recovery of vegetation becomes difficult and slow. Monitoring of recovery of woodlands was possible after an area is excluded from grazing for a period of as short as one to two years. Seedlings of *Commiphora, Terminalia* and *Acacia* species regenerate immediately an area is excluded from animal grazing and since these are not browsed, the open areas are fast covered. The success of vegetation recovery after grazing exclusion is an initially quick re-establishment by a dense shrubby layer. The dominant species in the shrub layer are *Hermannia oliveri, Aspilia mossambicensis, Solanum incanum, Chloris roxburghiana* and *Sporobolus fimbriatus*. This layer creates a favourable condition for the quick establishment of drought woodland species dominated by *Commiphora africana, Acacia senegal, A. tortilis, A. mellifera, A. brevispica* and *Terminalia brownii.* Within two to four years some of the species grow to heights beyond the browsing level by goats. This is a successful approach that has been promoted in the Ukambani districts and is largely now being used by the animal range management farmers in the restoration of degraded woodlands and thus providing more foliage and tree raw materials for various and more sustainable uses by the owners.

Social Forestry Extension Model

As a result of an experience on social forestry and tree planting in dry areas of Kitui, Makueni and Kajiado Districts, a Social forestry extension model has been developed by the Kenya-Japan supported dryland initiative. It is expected that extension service and farmers would benefit from the model. The project proposes to develop appropriate guidelines for practical use of the various aspects of the extension model. The Belgium intervention has taken to the use of the project experience to develop district management plans for sustainable use by the extension service and farmers in the Ukambani districts.

Conclusion

The intervention accounted briefly above for the case of Ukambani region and Kajiado in Kenya provide important experiences and lessons which are being put in practice in the area. The experiences are potentially viable for use in other dryland areas of Africa. Capacity of farmers and extension service in rehabilitation of degraded drylands has been improved not only in the project areas but also the Eastern and Southern African region where participants from the regional countries have gained experiences of the projects for the last 8 years. Several intervention technologies have been developed and their use recorded verifiable impacts in reversing degraded lands into more sustainable use of the vegetation resources.

Contact:
The Director
Kenya Forestry Research Institute (KEFRI)
P. O. Box 20412
NAIROBI, Kenya.