

African case study

Horticultural production in the Mount Kenya region

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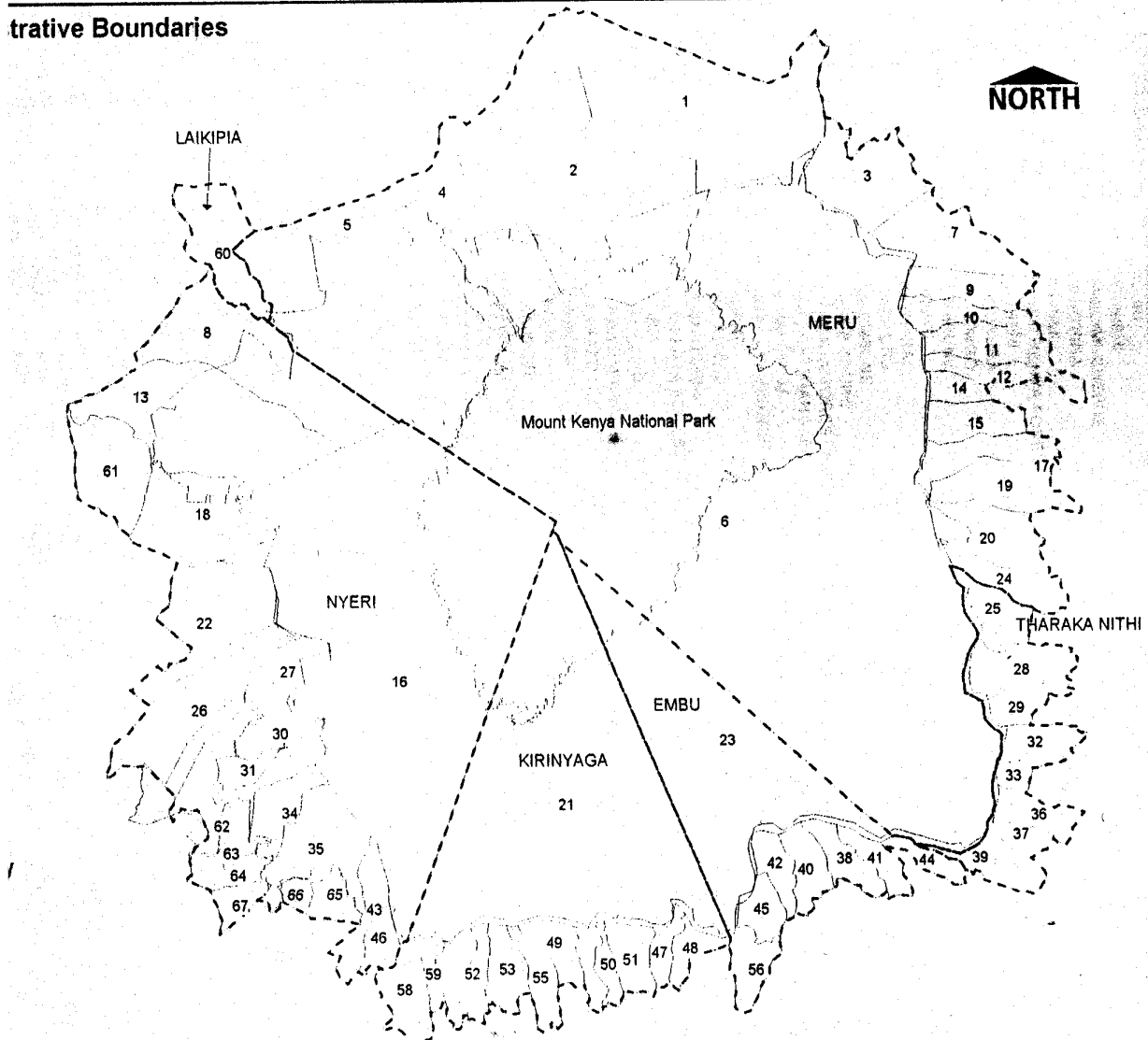
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1. History of the initiative

The Mount Kenya region consists of seven districts, as shown in Figure 1: Nyeri, Embu, Laikipia, Kirinyaga, Meru South, Meru Central and Tharaka Nithi (previously, the last three districts were one, referred to as Meru, which was split in the mid-1990s). This case study describes the activities of farmer groups within two districts in the Mount Kenya region, namely Embu and Meru South. The Mount Kenya ecosystem is categorized into four broad zones based on vegetation, altitude, land use and management, as shown in Table 1.

Figure 1: Map of Mount Kenya region



The Mount Kenya region is composed of a forest reserve that covers an area of 200 870.9 ha, spanning Embu (18 398 ha), Kirinyaga (29 215.3 ha), Meru (53 560.6 ha), Nyeri (60 402 ha) and Tharaka Nithi (39 300 ha). The forest is one of the largest, most ecologically significant and commercially important natural forest areas in Kenya and is considered among the highest priority forests for national conservation. The forest has a profound influence on the livelihoods of the communities living within this region.

Table 1: Categorization of the Mount Kenya ecosystem

Vegetation/land use	Agro-ecology	Altitude (m)	Area (ha)	Status	Management
Alpine and nival peaks and moorland	Tropical alpine	> 3 300	71 500	Largely pristine	Kenya Wildlife Service
Montane and subalpine forest and bamboo		2 500–3 300	200 871	Generally good-quality, patchy degradation	Forest Department (Naro Moru) KWS (Sirimon salients)
Submontane forest	Upper highland	1 800–2 500		408 300	Severely degraded
Mixed smallholder agriculture, agroforestry	Lower highland	1 200–2 400	Human land use, agroforestry practised		Private and communal landownership
	Upper midland	1 220–1 800			

Source: Tanui, 2002.

The forest reserve surrounds the 71.5 km² Mount Kenya National Park, which contains the second highest mountain in Africa, at 5 119 m. The three most important and closely linked forest reserves on Mount Kenya are the Mount Kenya forest reserve and the Imenti and Ngare Ndare forest reserves. The forest presents rich biological diversity that contains diverse vegetation, including endemic afro-alpine plant species as well as commercially valuable Juniperous, Ocotea, Olea, Podocarpus and Vitex timber species. The forests provide a wide range of fauna, including four threatened bird species. Recent studies (Bussman, 1994) have found the diversity in flora on Mount Kenya to be quite high. Some 882 plant species, subspecies and varieties belonging to 479 genera of 146 families were identified.

Mount Kenya forest forms a major water catchment area from which two of the country's five river basins arise – the Tana and the Ewaso Nyiro. Together these rivers supply water to more than a quarter of Kenya's human population in a region of more than half its land area, including the five main hydroelectric power sources that in aggregate provide nearly three-quarters of national electricity requirements. The recent long drought spells (in 2000) served as a useful reminder of the region's importance to Kenya's economy, as the rivers reduced in volume and the dam's hydroelectric generation capacity plummeted.

The region has tarmacked all-weather roads connecting the district headquarters of the various towns, but further into the interior the roads are poorer and very problematic, especially during the rainy seasons when the farming community finds it difficult to transport products to the markets in the major towns. These problems in infrastructure have resulted in a highly elastic crop products regime; the farmers are never sure of making a profit, as product prices may plummet below the break-even point, especially in high-rainfall seasons.

The declining incomes from traditional cash crops such as coffee and tea in the Mount Kenya region – resulting from low world market prices and the increasing cost of living – have prompted the farmers to seek alternatives in farm-level income generation. One area that was hitherto not fully exploited is that of tree crops. Various constraints hindered the development of high-value tree crops, including:

- shortage of clean, high-quality certified planting material;
- lack of mother plant sources;
- lack of knowledge on improved and new varieties;
- poor techniques in nurseries and poor maintenance of mother blocks;
- poor management of orchards and trees;
- lack of skills in plant propagation, pest management and fruit processing;
- insufficient agrotechnical measures for soil fertility.

The farming systems in this region were characterized by intensive tree crop production or intercropping systems under smallholder conditions. Furthermore, the major tree crops in production, including mango, avocado, pawpaw, passion fruit and banana, had poor market opportunities when the farmer groups' initiatives were launched. Constraints included:

- lack of developed farmer organizations;
- low prices for fruits and tree crop products offered to the producers by processors and traders, together with a highly fluctuating price regime;
- lack of marketing opportunities for surplus production;
- inadequate infrastructure and seasonal overproduction with consequently poor prices.

When, in the mid-1990s, various NGOs and international organizations began to develop the tree crop sector, the farmers (especially women farmers) took the opportunity to form groups in order to embark on two tree crop initiatives. One was the production of high-value tree crops through the use of good-quality germplasm and the subsequent training of farmers as trainers in tree crop propagation. These farmers later trained neighbouring farmers, thereby ensuring the continuity and sustainability of the venture. The second initiative involved training women's groups in tree crop product processing. This involved training women in the solar drying of mangoes and bananas and the making of jams and chutneys from pawpaws, mangoes, bananas and citrus fruits. Institutions involved in this initiative included the German Agency for Technical Cooperation (GTZ), the Ministry of Agriculture and the Horticultural Development Cooperation.

The farmer groups also sought microfinancing to enable them to purchase solar dryers, which were financed through the Kenya Industrial Estates' (KIE) informal sector programme. Over time, the farmer groups have diversified their processing to include other horticultural products. The projects that supported them have closed in the past four years, but the farmer groups have continued the project activities, although they now face a number of challenges in development. The initiatives have resulted in a tenfold increase in the production levels of high-quality germplasm. The resultant increase in produce has made it imperative for the region's farmers to have a horticultural association to protect and develop their interest as small-scale farmers.

2. Technological aspects

The farmers in the area have been producing export-quality mangoes of various varieties since the mid-1990s, and they now have individual nurseries as well as group nurseries for the propagation of good-quality germplasm through the utilization of mother blocks. These were established through the assistance of NGOs that have since stopped operating in the area. The NGOs were involved first with providing training on crop propagation techniques and then with nursery establishment and support to the supply of good-quality germplasm. They also offered training to women's groups on the village-level processing of major horticultural farm produce in the area.

The farmer groups involved in the sun drying of mangoes, bananas and vegetables use portable solar dryers. The portable dryers were first purchased from Nairobi, but the cost was prohibitive. Many of the first batch of dryers were purchased through microfinancing from KIE and later, when GTZ trained local carpenters, some dryers were manufactured locally. The carpenters needed more training in order to make improvements to the solar dryers they were producing, but the GTZ project closed before it was able to provide this training. Currently, most of the dryers are in need of repairs, and the local carpenters need support through retraining so as better to assist the women's groups, which are still in business despite

not having had any external support in the four years since the GTZ-sponsored project closed. Currently the groups face the following challenges:

- Poor packing and packaging material is leading to deterioration of the quality of goods.
- There is poor communication among the groups, and little assistance from the Ministry of Agriculture.
- Most of the dryers were not constructed according to specifications, and have sagging trays and gaps at the doors, which result in a poor-quality product.
- Most groups have inadequate storage facilities at the group level. This creates problems because they then have to transport their product to local centres for storage. This constitutes an added cost to the groups and lowers their profit margins.
- The products need better market promotion to enable their sale both locally and in the town centres.
- Delayed payments by some of the supermarkets that take the farmers' products lower the groups' morale.

Table 2: Identified constraints of major tree crops

Crop	Production	Utilization	Constraints
Avocado	1 500-2 100 m asl > 1 000 mm rainfall	Local and export markets	Lack of high-quality planting material at the farm level; lack of tree management; post-harvest losses; diseases
Banana	0-1 800 m asl > 1 000 mm rainfall	Cooking; fresh consumption ; export	Lack of planting material; diseases; high input prices; transport
Mango	0-1 500 m asl needs little care from smallholders	Local consumption ; export markets	Lack of high-quality planting material at the farm level; lack of tree management; marketing; poor nursery management; high input prices; diseases and pests
Passion fruit	1 000-2 000 m asl > 900 mm rainfall smallholder and large-scale	Hotels; fruit processing; export	Lack of high-quality planting material at the farm level; poor quality of seeds; lack of tree management; diseases; high costs of establishment; pesticides; transport
Pawpaw	smallholder, drought-tolerant subsistence fruit	Local market; jam industry	Lack of planting material; lack of new varieties; diseases; lack of high-quality planting material at the farm level

3. Economic aspects

The women's groups have managed to maintain average sales of 750 kg – mostly of dried mango, tomatoes and banana – in a season that fetched an average of Ksh 150 000 (about US\$2 000) for the 12 groups that are still active in the two districts. The amount generated is usually paid out to the members after discounting operating costs. This amount is considered a significant contribution to the household budget as it is received by the women, who are able to utilize it for their families' most immediate needs. It is also important because the group members pool the extra income and conduct a merry-go-round so that members can purchase such things as building material, water harvesting equipment such as big drums, and furniture for their homes, as well as paying school fees.

The activities have had a real impact on the community in that the projects have made it possible for households to have vegetables during the prolonged dry period when leafy vegetables are unobtainable. The jam, chutneys and other products from the groups are also utilized by individual members' households. This has been very beneficial nutritionally within the community, especially for the young and very old. In addition, having this assured income has meant that less pressure has been placed on natural resources such as timber and charcoal, which many households in the community usually use as sources of extra income, to the detriment of the Mount. Kenya forest.

4. Institutional aspects

As illustrated in Kenya's National Development Plan 1997 to 2001, there has been a drive towards increasing horticultural exports (flowers, vegetables, fruits), and this has had a positive impact on the income of small farmers. Government policy encourages the private sector to exploit this potential, and intends to reinforce the marketing campaigns, including the search for new markets and the improvement of infrastructure.

At the Ministry of Agriculture level the policy is to promote research and extension of high-value tree crops, cultivars and rootstock germplasm. The Department of Horticulture has highlighted the following as future priorities:

- the promotion of quality germplasm production and distribution through registered nurseries;
- facilitation of the introduction of new and improved varieties;
- the training of farmers in the propagation of quality cultivars and germplasm;
- technical assistance to the private sector;
- regional cooperation for germplasm research and distribution.

Another important strategy is to withdraw government organizations from germplasm production and distribution. However, although these policies are favourable to the development of horticulture, their implementation and supervision have been inadequate. There is very little inter-ministerial and cross-sectoral coordination. Moreover, the implementation arm of the ministry is not only short-staffed but also grossly underfunded.

LEGAL FRAMEWORK

Many institutions are involved in horticulture development (see Figure 2), and there exist many conflicting legal acts and regulations related to germplasm production and distribution, institutional gaps and overlaps, and fragmented responsibilities and procedures. In recent years, the Kenya Plant Health Inspectorial Service (KEPHIS) has been created as an umbrella organization, enabling germplasm control institutions to integrate all the services of the different ministries and parastatals for plant certification, testing, inspection and the development of standards, import procedures and quarantine rules. KEPHIS is not yet fully functional and will have to find a way to play its coordination role in spite of its lack of interministerial authority.

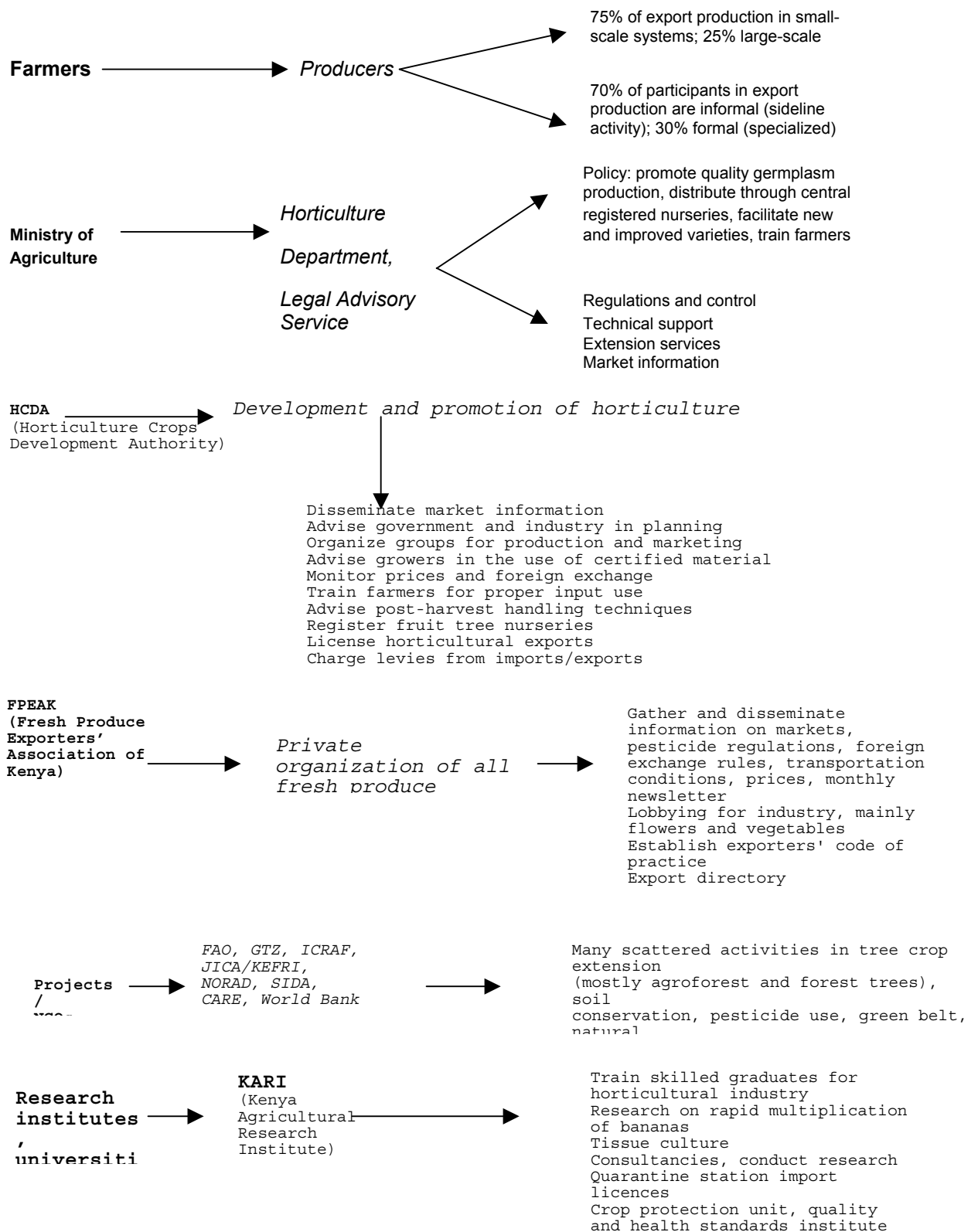
RESEARCH ACTIVITIES

Several institutions are involved in research on tree crops (see Figure 2), the most important being the Kenya Agricultural Research Institute (KARI). However, most research activities do not have a clearly defined research– extension linkage. Lack of participatory innovations further distances the research sector from the small-scale farmers.

5. Sustainability and replicability

The projects being undertaken by the farmer groups have the elements of sustainability, and the very fact that they have been operating for more than four years since they last received financial assistance is proof that they are a sustainable venture. Furthermore, the involvement of farmer trainers in the training of fellow farmers in tree crop propagation has made the farmers identify with all the processes, and made it possible to upscale the initiative.

Figure 2: Key players in horticultural development



References

- Bussman, R.** 1994. *The forests of Mount Kenya: vegetation, ecology, destruction and management of tropical mountain forest ecosystem.*
- Kidd, A.** 1996. *Alternative approaches to agricultural extension in Kenya; summary on the report and on its implications for GTZ.* June 1996.
- Republic of Kenya,** 1998. *Economic Survey, 1998.* Ministry of Planning and National Development and Central Bureau of Statistics.
- Tanui, J.** 2002: Incorporating a landcare approach into community land management efforts in Africa: a case study of the Mount Kenya region.