Reducing risk by fruit processing

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The agricultural sector plays the leading role in the economy of Kenya, providing export earnings, self-sufficiency in food, employment and raw materials for the processing industry. Agricultural production is dominated by cereals, grain legumes, root crops and several industrial crops but horticulture is gaining importance as a result of the general decline in performance of the agricultural sector. However, fresh fruit and vegetable crops are harvested over short periods and this leads to surpluses and low prices during the harvesting season, followed by shortages during the rest of the year. Moreover, fresh produce is perishable, bulky and susceptible to attacks by pests and diseases and as a result farmers incur losses through spoilage, wastage and low prices.

Processing of fresh produce into shelf-stable products could mitigate the effects of fluctuation in demand and supply, add value to farm production, help stabilize smallholder income and at the same time increase the range of products available to consumers. This article highlights the experiences of a local micro-enterprise in the processing of fruits and vegetables in Ukambani area, Kenya.

Livelihood in a risky environment

In the Ukambani area, the first rains fall between mid-March and end of May. The second rains come between mid-October and end of December. Average seasonal rainfall is between 250 - 400 mm. As a result, the major subsistence crops fail in two out of five seasons, while most fruit trees are able to take advantage of the total amount of rain received in both seasons and produce a good crop.

Ukambani has a high population density and the average farm size is between 1 - 7.5 ha. About 60 percent of the smallholder households are thought to live below the poverty line, on less than one dollar a day. Virtually every smallholding has at least one horticultural crop, which is either rain-fed or irrigated. The majority of smallholders grow traditional fruit varieties of low quality. Some farmers have been replacing these traditional varieties with improved varieties, promoted by the *Kenya Agricultural Research Institute* (KARI), but the low prices obtained for fresh produce during the harvesting period have tended to discourage the adoption of improved varieties and farming practices. A consequence is that farmers harvest only 20 - 30 percent of the potential yield.

Production and utilization

Recent statistics indicate that Kenyan farmers have committed a sizeable acreage to fruits and vegetables. In 1999 almost 3.3 million tons were produced, out of which 70,000 tons were exported. The rest were used by farm families for subsistence or sold on the domestic market. In Ukambani the most important horticultural crops are papaya, citrus, passion fruit, mangoes, avocado, bananas and tomatoes. Yields are comparable with the national average and Ukambani contributes a substantial part of the total Kenyan production.

The major harvesting season for citrus spans the period May through August, with a minor season in the months of October and November. Mangoes come into full production in one major season spanning the months of January, February and March. Papaya and banana production is more evenly distributed throughout the year, with peak seasons in March and June. This means that there is continuous supply of raw materials for processing throughout the year.

A survey to identify market opportunities and constraints for the fruit and vegetable processing industry in the Ukambani area was carried out in 2001. The aim was to quantify the availability of fresh produce and intermediate inputs (fruit pulp, and concentrates), to assess the market for semi-processed products (fruit pulps, pastes and concentrates) and to quantify the demand for final products. Seven processed fruit and vegetable products were identified by traders and consumers as commanding a significant proportion of the market in Ukambani. Fruit juice was the leading product, followed by ice cream. Then followed jam (marmalade and jelly) and tomato sauce (paste, ketchup and chutney). According to estimates, the demand for fruit produce in Ukambani would correspond to a volume of production equivalent to 7100 tons of fresh produce per year.

Processing in Ukambani

Local retail and wholesale outlets for processed fruit and vegetables products are at present supplied by large-scale food processing concerns located in Nairobi and its environs. Driven by business objectives, these large concerns have little interaction with local farmers. They get their fresh produce from as far away as Uganda, Tanzania, South Africa and even Egypt.

One consequence of the liberalization of the Kenyan economy in the eighties was that it became possible to start up local micro-enterprises to take advantage of market opportunities within the area. Established as a private company in 1987, Kamumo Products Enterprise is located in Machakos town, 70 km south east of Nairobi. The enterprise was founded with the vision that food security in the third millennium will be intricately linked with the market. The firm's mission is to promote better nutrition and health for the population through processing of agricultural produce, sound business management and skills transfer. The aims of the enterprise are to:

- Save fruits and vegetables from going to waste during bumper harvests
- Add value to fruits and vegetables
- Help stabilize the prices farmers receive for their fruits and vegetables
- Supply affordable fruit and vegetable products in the dry season
- Contribute to the creation of jobs and socio-economic development within the area.

The firm buys excess mangoes, citrus, papaya, tomatoes and passion fruits from farmers in Ukambani (Machakos, Makueni, Kitui and Mwingi districts) for processing into intermediate products (fruit pulps, fruit concentrates) and final products (juices, jam and sauces). Over the years productivity has increased, as has product diversification. Initially, the firm processed horticultural produce only into fruit juice. The range of products now includes jam and marmalade, tomato and chilli sauce and chutney. Total production has increased from 50 kg/litres per week to 3500 kg/litres per week. Kamumo Products sells finished products through wholesalers, supermarkets, hotels, cafés, hospitals and schools. The firm also reaches its market through participation in trade fairs, symposia, exhibitions and other business networks.

At inception, Kamumo Products employed one full time person. The number of employees has since risen to six. All the members of staff receive on-the-job training and work under direct supervision of Mr Frederick Kiilu, the proprietor and Managing Director. Over the years, significant changes in production technology have taken place. The aluminium utensils that were used in the beginning have been replaced with those made of stainless steel. Semi-automatic equipment has largely replaced hand tools. This technical progress has facilitated an improvement in product quality and at the same time, a reduction in unit costs. The firm finances its capital development and recurrent operations solely from profits and savings.

Several skills-transfer initiatives have also been undertaken by Kamumo Products Enterprise. *Kakumuti Syondo Women's Self Help Group* in Kitui town now processes juice and dried mangoes for sale to the local community, to supermarkets in Nairobi and even for export. Training for *Kakumuti Women's Group* was provided by Mr. Kiilu of Kamumo Products. Individual entrepreneurs in Nunguni, Kibwezi and Emali trading centres have also benefited from training. These enterprises process tomato sauce and fruit juice, producing about 180 tons of finished products per year.

Constraints to the development of micro-enterprises

Kamumo Products faces severe constraints. Examples are:

- Accessing credit from either the business community or commercial banks in the area is difficult for most small enterprises. This has seriously impaired the firm's capacity to undertake investment that should facilitate innovation.
- Variability in the quality of produce from local farmers and the deplorable state of the transport, storage and communications infrastructure represent a major challenge.
- The impact of climatic factors on both quality and quantity of fresh produce is difficult to predict.
- Lack of access to research and training opportunities for staff and appropriate specification of standards and product specifications represent a threat to the firm's viability.

There is substantial demand for finished products of fruits and vegetables, notably fruit juices, jam and marmalade and tomato and chilli sauce, but this demand is currently satisfied by processors of fruits and vegetables who are located outside the Ukambani district and who often resort to imported fruit juice concentrates and tomato paste. As a result, at least 10 - 20 percent of the fresh produce harvested in the area goes to waste for lack of marketing opportunities; and the increases in yields that would be possible through better varieties and better management remain unrealized. ■

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Building my farm

Kennedy A. Mulela

Bunyore lies in the basin of Lake Victoria in Western Kenya and is an area of granite outcrops and small streams. Our village gets enough rain but population is dense and our natural forests and wild life have become degraded. Some farmers try to earn a little cash by growing tea, others keep a few cows under zero grazing conditions for their milk.
I have lived in this community since I left school in 1988. I was trained for a white-collar future, but once I had my certificates I realized there weren't many jobs. I did not see why I should suffer when God had given me good health so I decided to go into farming because it seemed to offer economic independence.
Rural life in a traditional setting in a country like Kenya can be hard, but gradually I came in contact with individuals and organizations that helped me develop my ideas. This is my story and the story of the organizations that helped me build my farm.

Universal Youth Group members. From left to right: Washington Sikinvi, Elly Okemo and Kennedy Mulela.

The first organization to influence my farming practices was the *International Centre for Insect Physiology* (ICIPE). Together with other farmers we were shown how to grow neem trees that can be used, for example, to treat minor health problems. The *New Forest Project* provided me with trees such as *Gliricidia sepia*, *Sesbania* and *Leucaena* and enabled me to create woodlots that now provide me with fodder and firewood and help improve the quality of my soil.
Training by the *Forest Action Network*, an organization that lobbies for the preservation of forests, has increased my understanding of the role forestry plays in integrated farming systems and encouraged me to plant *Grivelia* trees which, if coppiced, grow very fast and provide good timber and firewood.
Networking has really empowered me in terms of contacts and knowledge-based ideas. Magazines like *LEISA Magazine* and *Spore* have provided me with references and information on farming experiences worldwide. CTA, who publishes *Spore,* has also supplied me with books and learning material through their special scheme and I am using them to set up a local resource centre. Two other magazines I read are *Agroforestry* published by ICRAF and *EcoForum* produced by the *Environmental Liason Centre International*.
Earth Action is another organization that has helped keep me up-to-date and aware of technologies that can help farmers develop and manage more sustainable systems. The techniques I have learned have not only helped me to produce good crops of cassava, bananas, sugar cane and sweet potato on my small farm, but sharing my experiences with other farmers has enabled us to work together to restore and preserve our environment. ■

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