

Partnerships between Farmers and Natural Scientific Community for Technology Development, Adoption and improved Livelihoods

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Abstract

Rural farming communities have not been involved in developing technologies initiated by natural scientists yet these are expected to transform their lives. Participation of the farming communities in problem identification, prioritisation of key research issues, joint planning, execution and monitoring is a new phenomenon being presently utilised by natural scientists to increase impact of their endeavours. Experiences from indigenous fruit and cassava processing in rural Malawi indicate that the continuum is necessary to increase net income for rural households. While farmers are very interested and provide full support, lukewarm cooperation and understanding is forthcoming from social scientists. Linking farmer and vendor groups to confectionery industries as well as quality and standardization were identified as critical strategies for enhancing marketing potential of cassava. Enabling policy framework for social science -natural science-extension partnership in applied and basic research is necessary and timely.

Key words: participation, community, cassava, indigenous fruits, processing, technology, quality

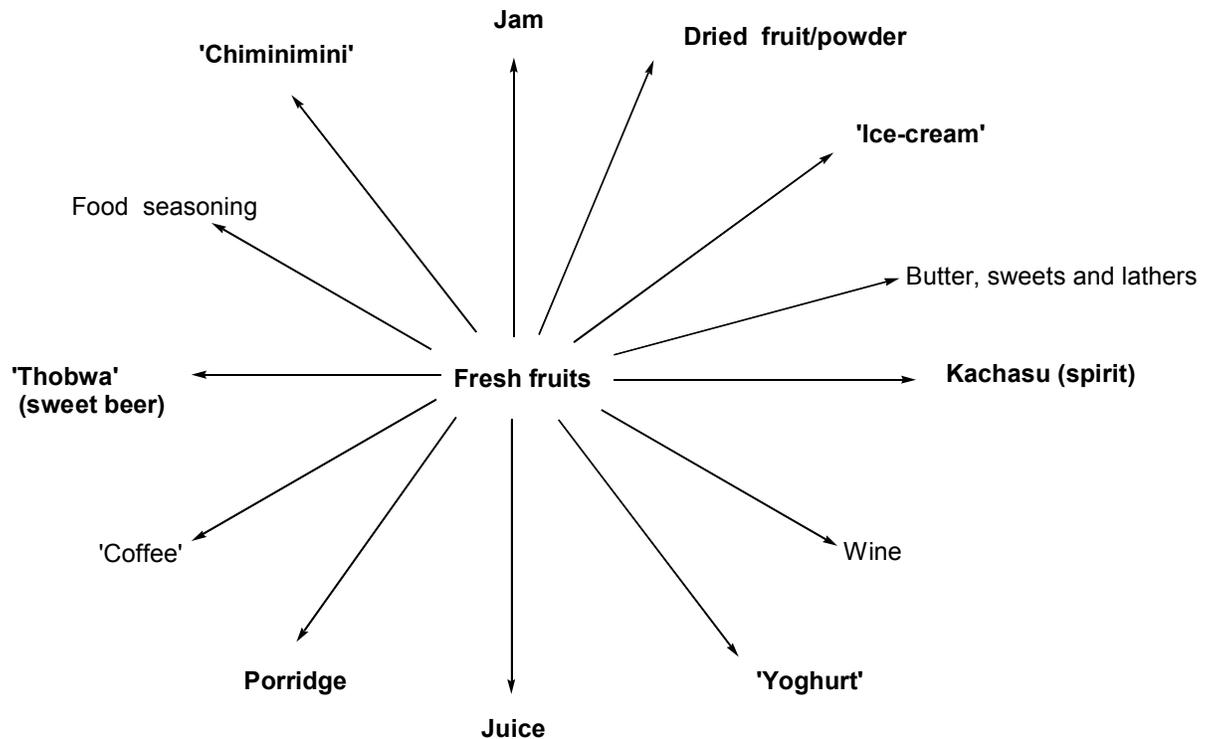
Introduction

Real participation is a process in which the community are involved in the planning, organisation and decision-making of the project from the conceptualisation (Isager, 2002, CIAT, 1990). This is very essential when developing, testing and evaluating technologies based on forests and homestead farms, which are important sources of non-timber products including indigenous fruits and food crops. These are essential for food security, health, social and economic welfare of rural communities (Akinifesi et al, 2000; Maghembe et al, 1998). Integration of farmers' innovations has led to the discovery of numerous and valuable local and ingenious innovations (Waters-Bayer and van Veldhuizen, 2001). For example, a community in Brazil established a programme to select process and market the products in various forms (Velho et al., 1990). Therefore, active involvement of farmers, extension agents and social scientists in technology development by natural scientist is necessary to facilitating joint experimentation by farmers and relevance and focus. Experiences in processing and value addition to cassava and indigenous fruits are provided.

Indigenous knowledge on utilisation and processing

Identification of local knowledge and preferences of indigenous communities is a key to technology development. In the case of indigenous fruits and cassava, this facilitates domestication of trees and commercialisation of their products (Kwesiga et al, 2000). Farmers prefer simultaneous exploitation of indigenous and exotic fruits for product development in order to expand product range and meet market needs (Saka et al, 2002; Schomburg et al, 2002). The various products based on local processing technologies are provided in Scheme 1.

Scheme 1: A summary of some products from indigenous and exotic fruits in Southern Africa



Fresh fruits are processed in order to provide a palatable product, preserve the product, and obtain products which can be converted into other by-products (Dietz, 1999). Local processing and commercial production of indigenous fruit based products in Southern Africa is limited because of lack of sustainable supply of indigenous fruits, inadequate technical information on technologies, quantitative information on the market potential of the products and an assessment of the potential benefits to farmers (Dietz, 1999).

Fresh fruits are perishable and incur direct or indirect nutrient and quality losses between the field and the consumer. Generally, post harvest losses in fresh fruits are estimated to be 5-25 % in developed countries and 20-50 % in developing countries (Kordylas, 1992). This is due to lack of knowledge in fruit handling and marketing, lack of familiarity with some of the fruits, poor flavour/taste, astringency and presence of larvae. Losses in fruits reduce the quantity and quality of food available for family consumption and sale. The involvement of farmers in prioritising problems and key research areas will facilitate identification of relevant interventions (Munoz, 2000).

Commercial cassava processing and marketing in Malawi is limited due to lack of adequate technical information on technologies, non-involvement of farmer groups, limited quantitative information on the market potential of the products and an assessment of the potential benefits to farmers (Dietz, 1999, Minde *et al.*, 1999). Varied products, which are consistent with various tastes and preferences of the consumers and industry, are expected to expand utilization and markets (Bancroft *et al.*, 1998). An important strategy to this end therefore involves building and enhancing partnerships among the cassava growers, middlemen/vendors, the private sector and the scientific community (Bancroft *et al.*, 1998, Sandifolo *et al.*, 1999; Moyo *et al.*, 1999).

Utilization and processing of Cassava

Farmers in Milonde extension planning area (EPA), Mulanje in Malawi consume cassava in various forms: fresh roots, *makaka*, *nsima*, boiled roots, sweet beer and *futali* (Table 1). The most

important processed products, which need further improvement, are fresh roots, *makaka*, sweet beer, *futali* and boiled roots in decreasing order of ranking. *Makaka* is a key important raw material for various cassava-based products. Cassava is grown in the study area to ensure food security and income (Moyo *et al*, 1999). Farmers grow cassava to meet food requirements and also to sell to raise income for their households, while cassava vendors sell cassava in order to raise income for their families (Table 1). Cassava prices are affected by the availability of fresh cassava and hence time and source of the product.

Table 2: Utilization of cassava in Milonde EPA, Mulanje RDP

Varieties	Products	Quality requirements
Balaka (early maturing)	Flour	Sweetness
Romani (for dry roots)	Boiled cassava	Maturity
Chithekere	'Futali'	Softness
Muyaya	Makaka	Unrottenness
Kaligonje (field storage)	Sweet beer	
Manyokola (for snack)	'Makatha'	
Ngwalangwa	Beer	
Masangwi		
Matuvi	Essential products	
Samusoni	Flour	
	'Futali'	
	Sweet beer	
	'Makaka'	
	Boiled cassava	
	Priority products	
	'Makaka'	
	Flour	
	'Futali'	
	Sweet beer	
	Boiled cassava	

The major constraints to marketing of fresh cassava include weevil attack and rotting, fast deterioration of quality after harvest, and price fluctuations. The critical problems for dried cassava products are weevil attack, presence of foreign matter (e.g. sand), mixed colours, mould development and slow drying during rainy seasons. The presence of sand in cassava chips is due to poor hygiene during sun drying. Training in this area is an important venture to ensure quality products, which satisfy and meet industrial specification and needs. Establishment of an effective and viable partnership among the industry, vendors and farmers is necessary in Malawi. The critical role of natural scientist in ensuring standardisation and food quality cannot be emphasised. Participatory involvement of cassava growing community and the scientific community has established a significant relationship between bitterness and taste (Chiwona-Karlton, *et al* 1999).

Product development and farmer participation

The choice of products based on fruit trees or cassava is dictated by the consumer acceptability and potential impact on the nutritive security and income generation (Kwesiga *et. al.*, 2000). The importance of farmer preference of fruit products to achieve greater impact is well known (Munoz, 2000; Maghembe *et al.* 1998). Consumer evaluation and ranking of processed products and subsequent improvements results in better and more acceptable products. For example, consumer evaluations of two fruit jams seem to indicate that *Strychnos* jam is significantly different from *U. kirkiana* jam (Saka *et al*, 2001). These quality differences and greater easiness in spreading on bread account for variations in consumer preferences of fruit products (Ennis *et. al.*, 1979). Further cotton cloth filtering of *U. kirkiana* juices increased consumer acceptability than those the sieve filtered juices (Saka *et al.*, 2002). The cloth filtered fruit juices were preferred because of clear appearance. Mixing the *Uapaca* fruit with guava pulp lowered the ranking due to reduction in the indigenous fruit flavour and taste. Clearly, participation of farmers in product evaluation will ensure acceptability and continuous improvement of product quality (Dietz, 1999).

This approach is practiced in plant breeding, where breeders, producers, traders and consumers participate in the whole breeding process (Mkumbira, 2002).

Training of farmers in processing

Capacity building is critical at all levels for the successful technology development (Akinnifesi, 2001). Farmers need training in several areas including processing, standards, business management and marketing information (Schomburg et al, 2002; Dietz, 1999) increase utilisation and acceptance at household level and in urban and more affluent communities. Unless farmers participate in the research-development continuum, the capacity building needs and skills will not be properly identified.

Summary and Conclusions

Using local knowledge systems and facilitating farmer linkage with industries and research institutions is necessary to enhance product processing, marketing and utilization in Malawi. Their active involvement in product development, testing and dissemination will ensure high quality products for household nutrition and income generation as well enhance ownership of the programmes.

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