NON-WOOD FOREST PRODUCTS

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Domestication and commercialization of non-timber forest products in agroforestry systems

Food
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Non-timber forest products marketing: field testing of the marketing information system methodology

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Abstract

Despite their overall economic importance, studies have shown that the proportion of the final sale price of non-timber forest products (NTFPs) received by the local level of producers or processors is extremely small. The main reason for the low profitability of NTFP enterprises is the lack of an organized information system to help individual producers organize production and distribution, determine appropriate prices, select markets, follow supply and demand, or promote merchandise.

An evaluation of the two marketing information system (MIS) field test sites in Uganda of the Forests, Trees and People Programme revealed that MIS had a significant positive impact on the two communities. The information on product sales was used in both communities to adjust production and stocking levels and product lines and, in the process, increase the profitability of their enterprises. MIS was also used to change product mix and to target different market niches.

The impact of MIS seems to have been greater in the community (Masaka) that participated the most in the design of the system. They had the greater appreciation of the potential value of MIS.

Introduction

Non-timber forest products (NTFPs) have received increasing attention and are making significant contributions to local economies. In India, for example, the NTFP sector provides over 30 million jobs (Koppell 1993). The continued importance of NTFPs as a source of income and employment for the people at the grassroots has led many people to initiate or increase production and to harvest NTFPs for various markets.

Studies have shown that, despite the overall economic importance of NTFPs, the proportion of the final sale price that the small-scale collector, producer or processor gets is extremely small and, therefore, that profitability is low. The main reason why NTFP enterprises are not more profitable is the lack of an organized information system to help individual producers organize production and distribution, determine appropriate prices, select markets, follow supply and demand or promote merchandise. Even when there is market information, it is frequently not disseminated to local small-scale producers.

In 1992, the Forests, Trees and People Programme (FTPP) developed guidelines for the creation of local-level marketing information systems (MIS) for NTFPs. The objective of developing MIS was to assist producers increase the income they derive from their small-scale NTFP enterprises, while at the same time learning about marketing, the production chain, simple accounting and new production processes. This knowledge should also increase the leverage and market power of the local producers and sellers.

Development of a methodology for the local design and operation of MIS was initiated in 1992 in the Philippines (3 sites) and tested in the Solomon Islands (2 sites), Bangladesh (1 site), Uganda (2 sites) and Peru (1 site) in 1993.

The range of participants, the kind of information they collected and the type of products for which they collected information varied widely. In the Philippines, Bangladesh and the Solomon Islands, farmers and swidden cultivators focused on marketing information about cultivated and gathered agricultural and forestry products, including tree leaves, fruits, nuts and lianas. In contrast, in Uganda, participants were groups of small traders and producers of baskets, mats, chairs, stools and bags derived from NTFPs. The MIS was structured to collect and analyse information on sales from the stalls and determine consumer preferences.

Definitions

Markets are potential outlets for products. They include places and institutions where people are interested in selling or purchasing a given product or service.

Marketing encompasses all the activities involved in determining and meeting the needs and interests of customers, to maximize profits. Marketing involves 'finding out what the customer wants and helping to set up the production/marketing system which supplies that demand and maximizes income' (Dixie 1989).

Marketing information includes all the data that help those involved in production and selling to determine and meet the needs and interests of the consumer.

Marketing information system (MIS) is an organized procedure for gathering and analysing information. It involves collecting, analysing and distributing predetermined types of marketing information (table 1) for informed decision-making and increased bargaining power.

Table 1. Content of a marketing information system

- Prices for products
- Price differences—retail, wholesale, farmgate
- Explanations for changes in price or demand
- The names and locations of traders
- The volume, quality and packaging requirements of various markets and traders for different products
- Price variations by market for products
- Sales and marketing channel alternatives (direct sales, middlemen, cooperatives, wholesalers, retailers, marketing boards)
- Distribution channels that exist (transportation alternatives, storage facilities)
- Promotion opportunities (product shows, advertisements, incentives, packaging)
- Terms of payment alternatives (barter, credit, cash, labour)

Non-timber forest products (NTFP) include all tangible products, natural, crafted or processed, derived from forests or any other land under similar use, other than timber (Chandrasekharan 1995).

Steps taken in creating local-level MIS for Uganda

Selection of sites in Uganda
The following factors were used to determine whether a given site was suitable for the establishment of MIS:
- Expression of local needs and interest in using marketing information: local interest is

necessary to ensure the collection of reliable data and its sustained utilization in an MIS.

- A level of production above the subsistence level: where families and individuals produce solely to meet their own needs, there is no relevant market about which to gather information.
- Producers of NTFP have physical access to data and information: if the source of information is far away, travel costs could prevent its collection.
- A high level of 'community' spirit: to establish a cooperative, locally run and managed information system, local people must work together.

Using the above criteria, two participating communities were selected, one in Mukono town, 10 km east of Kampala (Mukono handicraft seller), and one in Masaka, 80 km west of Kampala (Bamuna supermarket).

Getting baseline information

One of the two participating communities (Masaka) proceeded through the entire design process before starting to collect data. Using participatory rural appraisal (PRA) methods, it made each design decision as a group. Using the checklist presented in table 2, it obtained baseline information about the goods that are produced in the area, production levels, use and sales of various NTFP.

Table 2. Forest and tree products questions about the NTFPs to be covered by the MIS

Which non-timber forest products are harvested/produced in the area?
- During which season are these products produced?
- Are they or could they be produced/harvested on a sustainable basis for the foreseeable future?
- During which season are they used?
- Who uses these products?
- How are these products used?

Are there any products that are not produced or sold that could potentially be produced/ sold in the future?
- If so, why are they not currently sold?

What happens to the products after they are sold?
- Are local people aware of where the products are ultimately used?

What problems are currently faced in attempts to sell non-timber forest products?
- How are local people trying to solve these problems?

Designing the system

Having gathered the relevant information, the community proceeded to design the MIS. Each design decision was discussed by the community to ensure that all the relevant considerations were thought about.

The primary design decisions made during the PRA exercises addressed the following points:
- what are the goals and objectives of the MIS?
- who would benefit from the information (the target user group(s))?
- what types of data should be gathered?
- what are the sources of information?
- who should analyse the information and how?

- how should the information gathered be communicated?
- what are the training needs of the community?

Implementing the system

Once the design process was completed, implementation of the MIS commenced. Adaptations to the design were made during the process of implementation. The implementation stage consisted of organizing collection and analysis of information, establishing the monitoring and evaluation structure, and instituting the training programme.

The importance of local participation in the design process

Active participation of users in the design, operation and evaluation of the MIS is crucial to the success of the system. This is because the overall goal of any MIS is to serve the needs and interests of the target (user groups). Involving local people in the design process ensures that the information gathered and that the approach taken to data collection are appropriate given local circumstances. It also increases local ownership of the MIS and commitment to its sustained operation.

To test these assumptions, the second participating community (Mukono group) did not go through the whole design process. The group met with the local field test facilitator twice, was given predesigned forms and was taught how to collect marketing information. This community used the information collection forms designed by the Masaka group (table 3). Training in analysis and use of the information took place once data collection had started.

Table 3. Bamuna supermarket data collection sheet

Items sold	No	Size	Colour	Types of customer	Other items needed
Mat					
Basket					
Large basket					
Tray					

Findings of the study

Using MIS, producers and sellers of non-timber forest products were able to determine which products sell best, and hence which products to offer for sale in future (introducing new products and eliminating others). The information also indicates the product quality and quantity that are most in demand by the customers (table 4, for example from Bamuna).

At the end of every month, the numbers of items of each type sold were analysed and discussed by the participating stalls and producers. The results showed that there was a high demand for baskets, followed by trays and mats. It was advisable, therefore, to invest more in baskets than in mats. In the basket sales, small baskets were preferred. A total of 76 small baskets were sold in one month compared with 41 large baskets sold in the same period. However, the demand for large trays was higher than that for small ones. Colour also influenced customer choice. Tourists preferred brightly coloured baskets and trays while local people preferred plain ones. Tourists were the main purchasers of all the handicraft items sold. The handicraft producers should therefore target the tourists specifically.

Table 4. *Bamuna supermarket—NTFPs sold during August 1993; overall sales of different products*

	Sold			Size preferences		
	Tourists	Locals	Total	Small	Large	Total
Mats	5	14	19	6	13	19
Trays	18	10	28	18	10	28
Baskets	72	45	117	76	41	117

Colour preferences			
Mats	No. sold	*Small baskets*	No. sold
Plain white	8	Red	1
Green + purple	6	Purple	10
White + red	3	Purple+red	10
White + green	2	Red+green	9
		White	26
		Green + purple	3
		White + orange	7
		Yellow + green	1
		White + purple	2
		Green	4
		Orange + yellow	2
		White + green	1
Total	19		76
Trays		*Large baskets*	
Purple+green	6	Orange + green	6
Yellow+green	3	Green	3
Purple+yellow	3	Red + white	1
Purple+red	5	Green + purple + red	25
Green+red	6	Green	2
Red+yellow	4	Green + purple	1
White	1	Purple	1
		Purple + red	2
Total	28		41

Impact of MIS on participating communities

An evaluation six months after implementing MIS found that it had had a significant impact on business practices and marketing in both sites. Additionally, the MIS had improved the general confidence of participating groups and their willingness to collaborate on other projects.

A secondary objective of the project was to determine if the level of community participation in the design of the MIS had had an impact on its effectiveness. The MIS was designed according to the community choices in Masaka while in Mukono the facilitator designed the information collection system without community involvement but based on the Masaka information.

Masaka site

At Masaka, the introduction of the MIS led to significant changes in business practices. The impacts of the MIS are arranged of their importance to participants:

- **Improved ability to respond to consumer interests**

Participants cited this as the most beneficial effect of the MIS. Increased market transparency has increased their knowledge of the products and product attributes customers desire.

Using MIS information, Masaka participants changed the range of products offered, introducing some products, eliminating others, the specifications of those products, the items requested from producers, and the level of quality demanded from production.

Participants noted that the most important change in approach to business was that the seller now asked customers what other products, colours, shapes and sizes they would like to have available. In Masaka, participants wanted to have more information on how products were used once they were purchased so that they could change specifications according to the end use. For example, the raw materials used could be adapted to meet specific uses.

- **Increased ability to target market segments**

Through the information collected, Masaka traders tried to target their market more specifically. For example, the colour preferences of tourists could be matched to the market and influence production accordingly.

- **Ability to work together**

Participants found that discussing the marketing information together gave them the opportunity to discuss business, so that a movement towards collaboration in purchasing and ordering was developed.

- **Price-setting ability**

Masaka used analyses of sales to improve price setting in response to levels of demand.

Mukono site

At Mukono the MIS, once again, had an impact on business practices, but the order of importance of the factors affecting impact was slightly different from that at Masaka. According to participants, the following are the most important changes:

- **Improved ability to respond to customer interests**

Mukono participants also felt that the MIS was most helpful for deciding what to stock and produce. However, they did not use the information to expand or change their product lines, although they did use it to place orders and buy new materials. Mukono participants did not, however, follow who was purchasing the different items. Their ability to target specific markets was therefore more limited than that of Masaka.

- **Ability to set prices**

Like at Masaka, the people of Mukono used sales information to determine prices.

- **Ability to work together**

The Mukono participants formed a traders' organization, following the initiation of the MIS. Although this group was more resistant to working together, their organization did move towards greater collaboration and, for example, purchased some raw materials in bulk.

- **Decreased cost of production**

Participants felt that a side effect of the MIS, through bulk purchasing of raw materials, was a decrease in the costs of production.

From these limited results it can probably be concluded that the group that had been involved in the design of the MIS had the greater feeling of ownership of the project and thus gained the most.

Programme shortcomings

The programme was generally a success; however, some significant shortcomings were identified:

- **Limited community inclination to independently expand and adapt the system to changing needs**

The facilitator was the driving force behind the evolution of the MIS. Although communities are able to collect and use marketing information, they seem either unwilling or unable to make adjustments to the system on their own. Some attention therefore needs to be devoted to ways to construct the MIS to encourage greater self-help. Perhaps with time and increased self-confidence, community willingness and ability to adapt the MIS will grow.

- **Limited capacity to sustain MIS without external support**

The communities would like to continue to operate MIS; however, without continued support and facilitation, it seems this may not happen. It is therefore important to consider how to make marketing information systems more sustainable. Both communities are very interested in continuing to work with FAO and Makerere University to develop their marketing potential and business operations.

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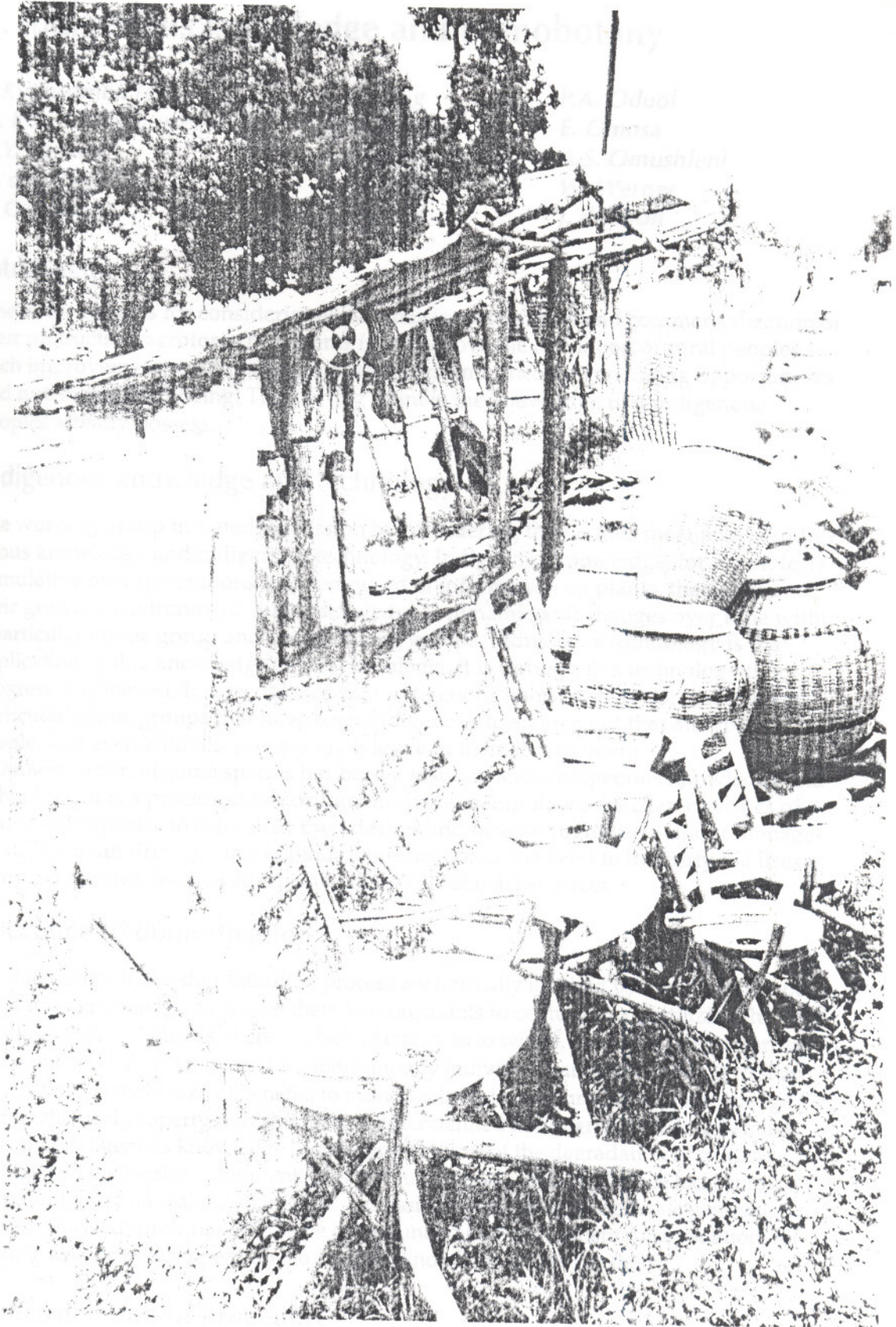
Plate 25. *Handicrafts from non-timber forest product raw materials, at Mukono, 10 km along Kampala–Jinja road, Uganda.* (photo: A.Y. Banana)

2. Indigenous knowledge and ethnobotany

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Introduction

One of the reasons for considering the domestication of trees and commercialization of their products in agroforestry systems is to improve the livelihood of rural peoples. Such improvements could be in production systems, income-generating opportunities and nutritional well-being. The starting point is the knowledge that indigenous peoples already possess.

Indigenous knowledge and technology

The working group initiated discussion by considering the various meanings of indigenous knowledge and indigenous technology. Indigenous knowledge, for example, is cumulative over generations and composed of information on plants, their uses and their growing environment. Such knowledge is dynamic as it changes over time within a particular ethnic group and varies among groups. Indigenous technology is the application of this knowledge to local problems. It is through this technology that progress is achieved. It is recognized that indigenous knowledge is not restricted to particular ethnic groups that have been indigenous to an area but that all types of people, and even animals, possess knowledge of their environment.

Domestication of some species has been a result of such indigenous knowledge and technology. It is a process in which humans have manipulated the characteristics of certain wild species to fulfil their own desires and have brought them under management. The main driving force behind domestication is the need to intensify the uses of particular species. Such needs may be the result of market forces.

Relevance to domestication

The initial steps in the domestication process are normally inspired by and make use of indigenous knowledge; however, there are constraints to capturing and utilizing this local-level knowledge. At times, there is a lack of clarity as to where, or from whom, information can be obtained. Also there can be a reluctance by individuals and communities to share information, as the return of benefits to individuals and communities with knowledge (i.e., their intellectual property rights) is often neither defined nor guaranteed. An alarming erosion of indigenous knowledge is occurring because of the degradation of cultural heritage and the local environment. Western cultural values can influence local cultural norms and cause a breakdown in the transmission of information from one generation to the next. Such cultural changes can be compounded by environmental degradation; for example as species disappear, so too does the knowledge related to them.

Standardization of procedure

The working group agreed that to document indigenous knowledge, procedures should be standardized with guidelines for information gathering. Overall, a systems

approach for the gathering of information was advocated that takes into account historical, socioeconomic and biophysical factors affecting availability, production and conservation of plant resources. Resources that have documented past indigenous knowledge include old colonial records, archives, museum collections and the writings of early missionaries. Indigenous knowledge can be gathered from the older generation of a community, but not necessarily solely from them, as knowledge is dynamic and all age groups possess some. Gender balance in gathering of information is also important, as men and women can value and use plants differently. In general, a trust should be built between communities and researchers. Appropriate acknowledgement and reimbursement is required for access to and use of the knowledge, as well as a return of benefits derived from such information. Ideally, local people themselves should be trained to document and preserve their knowledge. Furthermore, there is a need to assert the right of resource ownership by the communities, through approporiate policies, especially land tenure and legislation systems.

Indigenous knowledge can be difficult to utilize because it is often not comprehensively documented and its availability is variable. Even when available, its application is site specific, depending on ethnic groups and ecogeographic zones. The knowledge may not be tested or verified, since, for example, the success of medicinal products may be affected by psychological and cultural factors and not only by testable pharmaceutical ingredients. Furthermore, cures from local healers are often made by mixing products of several plant species together. The processing and isolation of compounds from medicinal plants by pharmaceutical industries may lose the synergy of different ingredients to cure illnesses.

Research priorities

It was noted that smallholder farmers do not necessarily need high-value products, as their main priority is often food security. It is therefore more logical to aim for higher productivity, as opposed to high-value products. The ideal ultimate goal would be to improve and increase productivity by using a diversity of domesticated or semi-domesticated species in agroforestry systems. High-value products are more suited for monocultures, which run counter to the conservation of biological diversity.

To promote indigenous knowledge and disseminate research results obtained from it, the working group suggested that, in addition to publications, audiovisuals, databases, electronic communications and mass media should be utilized and targeted to different user groups. These same methods can also be used to document knowledge. Furthermore, indigenous knowledge should be incorporated in school curricula. Scientists and NGOs should facilitate dissemination to academic institutions through seminars and lectures.

Where possible, working groups such as this one should include those actually possessing knowledge of plants and their environment, such as traditional healers.

The working group proposed that to benefit smallholder farmers and the environment and to improve productivity, the following were necessary in research activities:

- involvement of the communities in all stages of project development including decision making
- in situ and ex situ conservation of species and indigenous knowledge in agroforestry systems
- development of indicators that can be used to evaluate the impact of projects
- protection of farmer interest and the environment

Research constraints

To overcome constraints in retrieval and utilization of indigenous knowledge, the working group proposed the following:

- A comprehensive inventory based on indigenous knowledge of species and their respective products.
- Development and installation of databases containing the inventoried information in a regional bibliographic centre for ease of access and periodic updating. Such databases should encourage the sharing of information of ongoing activities between scientists, to avoid duplication, which not only wastes limited resources, but also burdens the time of local peoples.
- Establishment and promotion of species improvement networks (SIN) on selected priority species, such as those of common regional interest.
- Establishment of national, regional and international networks on the domestication and commercialization of non-timber forest products in agroforestry systems. Direct involvement of rural communities and small-scale farmers in the domestication of species in agroforestry systems and the commercialization of their products through training and technical assistance and by focusing on important species in rural areas.
- Ensuring local control by the communities over access to and use of their knowledge of resources.
- Adding value to indigenous knowledge by complementing it with scientific technology, particularly in the case of developing pharmaceuticals or with coordinating health care programmes with local healers.

Constraints for the development of databases were recognized as lack of financial resources, insufficient technical experience, and lack of goodwill among institutions to share information.

Conclusions

Ordinarily, inventories provide a large number of species with potential for domestication or commercialization. The working group identified a need to objectively select and test these species, as financial and labour constraints would not allow for all species to be promoted. It is recognized that local people's needs, priorities and preferences should be considered when identifying products. In this regard, methodologies of preference and priority ranking have been developed; however, it is uncertain that the priorities identified today will be useful even in the foreseeable future.

With regard to the pharmaceutical industry, the use of indigenous knowledge is not as straightforward as isolating an active ingredient and processing it into a tablet.

It was recognized that research should involve farmers as well as international centres, local institutions, NGOs and universities. In general, holistic testing of information and products was recommended. Provenance trials and species selection for use in different agroecological zones would be necessary. The working group believed that priority in research activities should be given to arid and semi-arid lands, because in the group's opinion those ecosystems are more fragile, causing people there to be more dependent on indigenous fruits and herbal medicines.