DOMESTIC MARKETS FOR NON-TIMBER TREE PRODUCTS: METHODOLOGICAL AND STRATEGIC ISSUES

NRI Socio-economic Series 14

A Gordon

NATURAL RESOURCES INSTITUTE
The University of Greenwich

The Natural Resources Institute (NRI) is a scientific institute within the University of Greenwich, and is an internationally recognized centre of expertise in research and consultancy in the environment and natural resources sector. Its principal aim is to increase the productivity of renewable natural resources in developing countries in a sustainable way by promoting development through science.

Production of this publication was funded by the United Kingdom's Department for International Development. However the Department for International Development can accept no responsibility for any information provided or views expressed.

No charge is made for single copies of this publication sent to governmental and educational establishments, research institutions and non-profit-making organizations working in countries eligible for British Government Aid. Free copies cannot normally be addressed to individuals by name but only under their official titles. When ordering, please quote **SES14**.

Natural Resources Institute
ISBN: 0 85954 491-5
ISSN: 0967-0548 Price: £5.00

Other titles in the NRI Socio-economic Series

Needs Assessment for Agricultural Development: Practical Issues in Informal Data Collection (SES1)

Commercialization for Non-timber Forest Products in Amazonia (SES2)

The Allocation of Labour to Perennial Crops: Decision-making by African Smallholders (SES3)

The Use of Geographical Information Systems in Socio-economic Studies (SES4)

Gender Issues in Integrated Pest Management in African Agriculture (SES5)

Indigenous Agroforestry in Latin America: A Blueprint for Sustainable Agriculture? (SES6)

Tree Resources and Environmental Policy: A Stakeholder Approach (SES7)

Development and Dissemination of Agroprocessing Technologies (SES8)

Labour Strategies Among Smallholders Producing Perennial Tree Crops in Ghana and Indonesia (SES9)

Survival Strategies of Poor Women in Urban Africa: The Case of Zambia (SES10)

Non-Timber Tree Products: A Partial Inventory of Products Available in the Mount Cameroon Area (SES11)

Livestock Production Extension: Issues, Case Studies and Policy Options (SES12)

Domestic Market Potential for Tree Products from Farms and Rural Communities: Experience from Cameroon (SES13)

Contents

Foreword

This series is based upon work carried out under the socio-economics and related research programmes at NRI. Its purpose is to provide an easily accessible medium for current research findings. Whilst it is hoped that the series will be of interest to those concerned with development issues worldwide, it may be of particular relevance to people working in the developing countries.

The topics covered by the series are quite diverse, but principally relate to applied and adaptive research activity and findings. Some papers are largely descriptive, others concentrate on analytical issues, or relate to research methodologies.

The aim is to present material in as straightforward a fashion as possible so that it can reach a wide audience. We are interested in the views and opinions of readers and welcome any feedback to this series.

Alan Marter
Social Sciences Research Manager

Acknowledgements

The authors would like to thank the staff of the Mount Cameroon Project based at Limbe, Cameroon, for their assistance during the field work. Special thanks are due to Ms Sally Tambe for her interest in this project and the enthusiasm with which she assisted with the survey work.

Abbreviations

CIFOR	Center for International Forestry Research
DFID	Department for International Development
FAO	Food and Agriculture Organization
ICRAF	International Centre for Research on Agro-Forestry
IFPRI	International Food Policy Research Institute
NRI	Natural Resources Institute
NTTP	Non-timber tree product
ODA	Overseas Development Administration

Summary

The value of growing trees on tropical farms for subsistence, commercial sale and environmental stability, has been increasingly recognized in recent decades. However, although impressive progress has been made in identifying and promoting a wide range of tree production systems, there has been very little associated research on the market potential of these systems.

This publication aims to provide a background on markets and how they affect agroforestry and forestry projects, with reference to recent research conducted by NRI in Cameroon on non-timber tree products (NTTPs). The specific characteristics of NTTPs which make the assessment of their market potential difficult are outlined, and strategic options for their development are discussed.

While conceding that the market research methods are essentially no different from those used in the assessment of markets for any agricultural commodity, the importance of informal methods in assessing markets for NTTPs is stressed. Secondary data are often scarce, partly as a consequence of the systems under which NTTPs are traded. Some common NTTP market failures are discussed in the context of appropriate tools for analysing market issues and associated development options.

Introduction

This publication does not describe market research techniques in detail as they have been extensively covered in other texts. However, Appendix 1 provides a brief overview of the components of typical market studies which apply both to NTTPs and other products.

NON-TIMBER TREE PRODUCTS: A DEFINITION

Non-timber forest products have been defined as follows:

> "all the biological material (other than industrial roundwood and derived sawn timber, wood chips, wood-based panels and pulps) that may be extracted from natural ecosystems, managed plantations, etc., and be utilized within the household, be marketed, or have social, cultural or religious significance" (Anonymous, 1992).

By adapting this definition specifically to tree products, some items, such as animal products, are dropped. The focus on tree products also emphasizes those with potential for cross-over from natural forest to agroforest or farm cultivation (Witcover and Vosti, 1995). In this publication, the definition of NTTP has been expanded to include all plant products and fungi (so vines and mushrooms, for example, are included even though they are not strictly tree products).

HOW MARKETS FOR TREE PRODUCTS AFFECT FOREST CONSERVATION

The value of growing trees on tropical farms has been increasingly recognized in recent times. Tree canopy, mulch and rooting systems can all contribute to the sustainability of farming systems in fragile lands and protect important watersheds which are intensively farmed. With declining access to natural forests and rising rural populations, there are new demands for tree products which must be met by farm production for subsistence or trade. Many believe that greater on-farm tree growing can also reduce deforestation pressures on nearby forests.

Although substantial progress has been made with farmers on the identification and promotion of a wide range of tree production systems, there has been very little associated research on the market potential of these systems. Most research and extension initiatives have begun with untested assumptions, for example, that product scarcity exists and is a problem, that farm production technology is the limiting factor, or that major plantings or intensive management by farmers will not lead to significant price declines. However, these assumptions have often been proved wrong. The failures of many 'sustainable' agriculture, agroforestry and community forest programmes have now been attributed to tree product 'market failures'. A poor understanding of NTTP markets hampers the development of appropriate policies for sustainable management and use of forest resources. Increasingly, researchers are seeking to assess market potential before investing scarce research funds in the improvement of specific tree species and associated systems.

In a series of consultative international and regional workshops entitled Priorities for Forestry and Agroforestry Policy Research (co-sponsored by IFPRI, ICRAF, CIFOR and FAO during 1991–93), tree product market research consistently ranked at, or near, the top of national forest policy research agendas. Policy makers and researchers complained that a major constraint was the lack of a conceptual framework for research on products which often had quite different market characteristics from annual crops or major, internationally traded commodities.

RESEARCH ON TREE PRODUCT MARKETS IN CAMEROON AND BRAZIL

NRI and IFPRI, with funding from DFID (formerly ODA), have been investigating the domestic market potential for

tree products from farms and rural communities with the following objectives:

(a) to highlight the constraints to the development of markets for traditional and emerging agroforestry and forestry products;

(b) to assess markets and market channels for tree products in two case study areas, identifying key constraints and opportunities for future market development;

(c) to develop practical methodologies for assessing markets for farm tree products.

Field work was carried out by NRI in Cameroon and by IFPRI in Brazil during 1995–96. This publication reports the NRI research on domestic markets for NTTPs, focusing on key issues arising from the assessment of NTTP market potential. A further publication documents the results of the field research in Cameroon (Fereday *et al.*, 1997).

THE ROLE OF MARKETS: THEORY AND PRACTICE

Proponents of free markets argue that they provide a reasonably efficient method of allocating resources. Markets (in the broadest sense) link suppliers with consumers; they facilitate the flow of information on the product volumes and quality characteristics available and required, and integrate inputs and services from other sectors to transform products into something consumers want to buy (by processing, handling, transporting, etc.).

If information is relayed effectively, markets can generate prices and incentives which reflect current levels of supply and demand (and implicitly, the choices and trade-offs faced by suppliers and consumers). Many policy makers assert that free market prices provide the signals for encouraging the most efficient use of resources for sustainable economic development. In the broadest terms, this underpins the current emphasis on the role of the market in structural adjustment and economic transition.

As the renewable natural resource sector (agriculture, forestry, fisheries) plays a pivotal role in the economy of most developing countries, serving as a springboard for the growth of other sectors, the efficient operation of markets for rural produce is particularly important. It has been maintained that efficient markets for tree products may encourage conservation by increasing the value of forests as a productive asset, provide an incentive for improved land-use practices, provide a means of expanding rural employment opportunities, improve the supply of rural produce to urban markets, and provide raw materials for the development of small- and medium-scale industry.

However, market performance often falls short of the theory for two main reasons: the conditions required for the efficient operation of markets are often absent or weak; and market theory does not yet provide guidance on the pricing of certain types of product, particularly environmental goods, whose value may be worth more to society as a whole than to individuals, or whose future value may exceed current value. Problems in valuation are especially relevant to the analysis of NTTP markets because interest in these markets can be attributed, at least in part, to an expectation that market development will lead to more efficient pricing of forest resources. Such problems may include the following specific examples.

(a) Price-setting in free markets necessarily reflects the current choices of society. Therefore, markets tend to under-value environmental resources whose future worth to society exceeds their current value. (Forests and biodiversity may fall into this category.)

(b) Markets also deal poorly with the divergence between private and social costs. A logging company felling trees, for example, incurs certain costs but by destroying a natural watershed, it inflicts additional costs on neighbouring farms (i.e., drought and hardship) which do not have to figure in its business decisions (unless obliged to do so by a tax mechanism).

(c) Markets cannot compel payment for a 'public good' (which, once provided, benefits a large group of people). These goods are often paid for through taxation (for example, national defence, police protection, flood prevention). Forests may also fall into this category by generating benefits for the global community.

Even if environmental pricing considerations were less important, conditions in NTTP markets, as in other markets, often diverge from those required to generate efficient prices and economic development. Therefore, the following assertions can be made.

1. Although information flow is a key issue in the efficient operation of markets, NTTP markets are often predisposed to poor information exchange (for many reasons which include remoteness and poor trading links, low traded volumes which are only available sporadically or seasonally, and opportunistic marketing frequently tied to other activities).

2. A free market depends on competition so any tendency towards monopoly (one seller) or monopsony (one buyer) may detract from efficient price-setting. Limited access to information or capital (to buy, store, process or transport products) may concentrate market power in the hands of a few individuals.

3. Government policy may cause market distortions in a number of different ways. For example, subsidies may be available for export-orientated industry, resulting in greater extraction of exportable NTTPs than of those consumed in-country, or regional development policy may result in a disproportionate allocation of feeder roads and hence, differing NTTP extraction costs.

4. Distortions in international markets may have 'knock-on' effects on local markets. For example, food oil exported to developing countries below cost (as with food aid, or production which is subsidized in the country of origin) may result in the loss of markets by local producers of palm oil.

5. In situations where income distribution is very uneven, improvements in market performance may reinforce disparities.

Understanding the markets for NTTPs is important because they affect the way that resources (i.e., trees) are priced and used, and may be subject to 'market failures' which limit their effectiveness as a means by which society can express choice. Information on the way NTTPs are used and traded can improve the design and implementation of forestry and agroforestry interventions, and highlight situations where market forces alone will not ensure an acceptable outcome.

It is perhaps surprising that so far, there has been relatively little research on domestic markets for non-timber tree products. Dewees and Scherr (1994) attribute this to:

> "the widespread 'anti-market' nature of forest policies; the emphasis on 'supply' among advocates of social forestry and agroforestry; and technical difficulties in undertaking market studies".

SOME TYPICAL CHARACTERISTICS OF NTTP MARKETING SYSTEMS

This section draws heavily on NRI's experience in Cameroon and feedback from others working in Africa, and the characteristics described may not apply elsewhere. (For example, IFPRI's work in Brazil dealt with larger farm sizes, and NTTPs were defined explicitly to permit the consideration of commercial-scale production of fruit trees.)

The term 'marketing system' describes the series of transactions which transfers a product from the production source to the final consumer and in so doing, integrates a number of services and inputs. Hence, the

marketing system for NTTPs may involve a chain of exchange and transportation, processing or storage, and access to capital. Any problem in these interrelated sectors will affect NTTP marketing.

NTTPs are often traded in low volumes sporadically, seasonally or opportunistically, because of their remote and dispersed production sources and specialized or traditional uses. Search costs may be relatively high (i.e., time-consuming) and specialist information on locations or products may be held only by forest users in that area. Sensitivity regarding the legality of forest access or extraction may generate secrecy and further concentrate information. Therefore, although some products have a high profile internationally (e.g. *Prunus africana*, Brazil nuts), many others, particularly those traded domestically, may be relatively unknown to outsiders (see Falconer, 1990; Scoones *et al.*, 1992).

In Cameroon, the extraction/production of NTTPs usually involves a seasonally changing 'basket' of products. In any one area, there are likely to be many producers or extractors each handling very small quantities of one NTTP. NTTPs provide one of many sources of income; they form part of a complex system in which rural people maximize the benefits derived from the limited resources at their disposal (labour, open access lands, possibly their own land, and minimal capital) while smoothing labour demands and income concomitantly.

NTTP traders are usually NTTP specialists (often, specialists in sub-sets of products such as medicinal plants) whose operations are linked only weakly to other agricultural crop markets. The need for specialist knowledge of markets and production areas, and access to capital for bulking-up, storage and transport, limits their numbers and gives them more market power than either retailers or producers. In Cameroon, they are the most dynamic group involved in the NTTP marketing system.

NTTPs in Cameroon are traditional commodities which are produced or extracted as part of the rural livelihood system, traded in markets, and used in local dishes or other preparations. They do not, however, appear to be declining in importance. With the migration to urban areas, traditional foods have become more widely available and have experienced a resurgence within the informal sector, which has itself increased in importance with urbanization and economic austerity.

Transport costs are often high because NTTPs usually come from relatively remote locations (i.e., where forest still remains) poorly served by transport. This is exacerbated in many parts of Africa by low population densities, poor roads which deteriorate in the wet season, long distances, informal road taxes, and an inexperienced new and small private sector. A combination of these factors may make transport prohibitively expensive.

Government interventions or regulations, official records, dedicated market infrastructure or readily accessible market information for NTTPs, are rare.

Methodological issues arising in respect of NTTP market assessment

The basic market research tools available to the NTTP researcher are essentially the same as those used for any other type of agricultural commodity market research, and the principal data collection methods remain the same whatever the scope of the survey. These methods are primary data collection, using either formal or informal techniques, and secondary data (i.e., using data collected previously by a different researcher). In most cases, a mixture of techniques can be used, although the particular characteristics of NTTP markets (especially the general lack of prior information) may predispose the researcher towards informal methodologies. If marketing functions or processing activities, such as modern processing or export, are more 'mainstream' or formalized, more secondary data may be available so more formal survey methods may become an option.

SECONDARY DATA

The usual starting point for market research is to review secondary data such as trade statistics (volume and value of commodities marketed and transported), prices (wholesale and retail, and price indices) and the results of previous sector or sub-sector studies. Several NTTP studies have made use of secondary data. For example, the FAO Regional Wood Energy Development Programme for Asia (1993) used official records of charcoal entering Ahmedabad, Gujarat, India, to estimate the size of the charcoal market (bolstered with survey and case study data). Padoch (1988) used secondary data, as well as interviews with traders, to examine the marketing of forest and fallow products in the Iquitos region of Peru.

There are, however, potential problems with secondary data. Although the reliability needs to be determined, information on who collected the data, by what method, and when, is often not provided in the source material. Even though these gaps can be filled by interviewing the individuals responsible for data collection, analysis and publication, discretion is still needed when interpreting the results. If environmental laws officially limit the extraction of forest products, those involved may seek to conceal or under-estimate their activities, and those responsible for monitoring the laws may be constrained by lack of transport and poor rainy season access to production areas, or compromised by their own involvement in the activity.

Also, secondary data may be unavailable for many NTTPs (which are often of relatively minor importance). Possible sources of secondary data include: national universities, especially dissertations and theses; government departments or central banks; development project reports, consultants' reports and international aid agencies; national and international research institutions; NGOs; local or provincial authorities; and private companies (for an exported product, for example).

Ideally, the market research will draw on a combination of secondary and primary sources, but where secondary data are scarce and possibly of dubious quality, there is an obvious trade-off between time spent in the pursuit and analysis of such data, and resources available for the collection of primary data. This is especially true of price data; price is a highly sensitive area which does not generally lend itself to less subtle survey methods, particularly if they are carried out by representatives of the local authority or government.

Researchers should also remember that they can facilitate the availability of secondary data by ensuring that their own research results are accessible, even if the results are inconclusive or unpromising. NRI publicized its work in Cameroon by linking with other local organizations and projects, and by holding a workshop to discuss research results and the related experiences of others working in the country.

PRIMARY DATA COLLECTION

Informal or formal approaches may be used to collect primary data. Formal collection techniques or questionnaires require a prior knowledge of the market system so that appropriate questions can be set and random samples can be drawn to permit wider extrapolation of results. This information may not be readily available, and preliminary informal surveys may be necessary to provide the required background data on which to base a formal survey. Formal methods may be preferred if quantitative data need to be collected.

Informal approaches may involve a wide range of methods, including non-random surveys and case studies typically employing semi-structured interviews with groups or key informants, and/or direct observation. Informal techniques are well suited to the collection of qualitative data; they can also be used for quantitative data, although generalizations to the wider population may be difficult if the informants have not been selected randomly. The check-list is an important tool in semi-structured interviews; it ensures that pre-determined topics are covered while allowing the enumerator the flexibility to

pursue other important issues which might emerge during the course of the interview. Informal approaches may be applied in 'rapid market appraisal', which is essentially a conceptual framework for analysing commodity markets by looking at all the inter-relationships within the market system.

Table 1 summarizes the main advantages and disadvantages of different data collection techniques. Appendix 1 lists the data collection techniques suited to particular information categories.

POOR VISIBILITY OF NTTPS

Initially, primary data collection may be impeded by the low visibility of many NTTPs. Box 1 lists some characteristics of NTTPs which may combine to make even observation difficult.

Although there is no simple way of overcoming these difficulties, those researching NTTP markets should be aware of them and should try to cross-check information in as many different ways and places as possible, and at different times. It is particularly important to recognize the different types of information available from different markets. In Cameroon, retailers were found to know relatively little about the production areas, and although wholesalers knew more, they knew less about production/collection than the communities living in those areas.

A product inventory was developed in Cameroon (Papadopulos and Gordon, 1997) which was initially based on three lists of products drawn up for different purposes by other researchers. The inventory has subsequently been revised as more information has become available from market traders, forestry experts, and others familiar with the sector. However, given the inaccessibility of many

BOX 1 POOR VISIBILITY OF NTTPS: CONTRIBUTORY FACTORS

(a) Production may be seasonal or even less frequent (e.g. trees may flower every third year).

(b) Demand for certain products may be limited to feast days, e.g. the use of sorrel (*Hibiscus sabdariffa*) at Christmas in drinks in West Africa and the Caribbean.

(c) Production and consumption may be very localized, depending, for example, on the agro-ecology or traditions within certain ethnic groups.

(d) Production sources are always likely to be dispersed (even within a particular locale).

(e) Production/extraction areas for NTTPs are often relatively remote or inaccessible for all or part of the year.

(f) Most NTTPs are traded in low volumes, usually with other products.

(g) People involved in the collection of NTTPs may be the relatively less visible or vocal groups (the landless, the poor, women and children).

(h) Products may have more than one name, be known only by local names, or have no known name.

(i) Environmental concerns (manifested by legislation or debate) or forest access restrictions may generate secrecy about activities.

Table 1 The advantages and disadvantages of different data collection techniques

Data collection technique	Advantages	Disadvantages
Formal sample survey	Basis for generalization	Expensive
	Ability to test hypothesis	Time-consuming
	Devolution of data collection and computerized analysis possible	Rigorous sampling procedure required (may be difficult to follow)
	Amenable to independent assessment and comparison with other studies	Implementation inflexible
		Difficult to control data quality
		Not amenable to collection of qualitative data
		Effective formal survey requires prior information
Informal surveys	Relatively cheap	Cannot generalize
	Relatively quick	Susceptible to subjective bias
	Flexible implementation	Difficult to assess quality of results
Secondary data	If easily available, quicker than primary collection	Difficult to assess quality of data
	Cheaper than primary collection	

Source: Adapted from Magrath (1992).

of the production areas, it is clear that gaps in the information are unlikely to be filled rapidly. As few products are listed by their Latin names, attempts to collate and access information from different areas have been particularly difficult.

ANALYSIS OF MARKET INFORMATION

The analysis of market information usually focuses on understanding the demand for a product (volumes, prices, product specifications) or on understanding how the marketing system works (as this may constrain the operation or size of the market). An entrepreneur will need to know initially whether a remunerative market exists for a product; only if it does will he/she require more searching information on market operation and access. Governments, however, may be interested in whether the market works for the benefit of consumers and may therefore be more concerned with the analysis of the marketing system. It is worth remembering these information categories when considering the analysis of market information.

Many NTTPs in Africa are traded informally in relatively small quantities over a wide area. Although it may be difficult to estimate market size accurately, information on prices and product specifications, as well as trader impressions of market saturation, can provide a reliable picture if different data sources are carefully cross-checked. When obtaining data through interview, researchers should avoid asking sensitive questions as they are likely to yield a poor response (avoid, for example, asking the same person about both buying and selling prices), and when cross-checking different responses, they should allow for predictable bias (traders over-stating purchase prices or under-stating revenues, for example). Preliminary 'back of the envelope' analysis of marketing costs may lead to the early elimination of unpromising products.

Greater skill is required, however, when determining the real potential of an apparently marketable product. In view of the relatively small market size for many NTTPs, the potential to flood markets and depress prices if any substantial changes in production or marketing are introduced is considerable. Detailed analysis of market trends and factors affecting demand (including price elasticities and the availability of substitutes) is required. More mechanistic approaches are likely to lead to over-optimistic projections.

Analysis of marketing margins may provide a good indication of market efficiency and accentuate particular problems or hidden costs. In a competitive market, margins would be expected to reflect costs, including an allowance for 'normal' profits (i.e., just enough to keep market actors interested). Apparently high profits may in fact reflect hidden costs (which could include search costs, credit costs, or even bribes) or a lack of competition resulting from barriers to entry (the need for specialist information or high working capital requirements). In view of the sensitivity about prices, margins and profits, quantitative information of this type is likely to be collected more effectively using carefully handled informal methods than by questionnaires.

Identification of the NTTP market chains can also assist in understanding the whole system and the roles of the different players. Market chains can be traced back from the retail market by asking traders where their products came from and so on. NRI's research in Cameroon showed that although the retailers often know very little about production, this information can be gleaned from the village markets in the forest area.

The research in Cameroon also highlighted the important dynamic role of the 'buyam-sellams' (the wholesalers who source products in forest areas and sell on to retailers) in NTTP trade. Their importance to NTTP projects is usually overlooked, but an understanding of the way in which they operate is essential if projects are to be designed appropriately. Consideration should also be given to ways in which the information held by traders can be incorporated more effectively into project design and implementation.

Strategic issues in NTTP development

The analysis of NTTP markets in Cameroon highlighted a series of strategic issues which affect the marketing of NTTPs and their role in conservation or development projects. The most recurrent and intractable issues are discussed below and although not relevant to all situations, they should be seen as a warning against over-ambitious expectations of market-based solutions to conservation problems.

LOW VOLUMES AND SMALL MARKETS

Relatively low volume markets and dispersed sources may predispose NTTPs to monopsony control by wholesalers or traders. Most primary producers lack the resources to store, bulk-up or transport their goods, but the low volumes

may attract so few traders that they have little or no choice over who to sell to, allowing traders to dictate prices without any upward pressure from competitors. This need not be the case, however, if the product is targeted on a local market in close proximity to the production area.

Similarly, the low volumes of many NTTPs (particularly of extracted products) mean that any attempt at their widespread domestication would result in a collapse of prices. This is particularly important for NTTPs because

(a) projects focused on the cultivation of trees for their NTTPs often result in a significant increase in marketable surplus, with insufficient attention being paid to the ability of the market to absorb such an increase; and

(b) once domestication has been achieved, it is often found that product *x* can be produced at a lower cost elsewhere, leading to the displacement of traditional producers or extractors/collectors.

Control by traders, flooded markets, and domestication elsewhere, may all lead to a reduction in the value of forest resources and therefore, less incentive to conserve them, a situation directly opposed to that intended by forest project planners.

However, there may sometimes be scope for market development or expansion, for example, if a market becomes accessible as a consequence of new roads. This emphasizes the importance of understanding the market before interventions are made.

SCOPE FOR DOMESTICATION OF NTTPS BY FOREST FRINGE COMMUNITIES

One reason for considering market potential might be to assess the scope for domestication of forest species by local communities to ease pressure on the natural forest. The effects of domestication, however, are often ambiguous, and need particularly careful appraisal if the target communities are to benefit. Essentially, although domestication may in itself alleviate some of the marketing problems faced by NTTPs (low volumes, inaccessible and dispersed supply at irregular time intervals, product variation or inconsistency, etc.), if it is too successful it can result in markets being flooded, or production being 'captured' by more efficient producers away from the forest fringe.

Careful consideration should therefore be given to factors which influence whether product *x* fits into the forest margin farming system(s). Attention should be paid to:

- seasonality of production, income and labour demands
- subsistence use and multi-purpose use
- benefits relative to other crops grown
- gender-differentiated tasks.

Production potential elsewhere which might displace the target group will also need to be assessed. **Diseconomies** of scale (where close planting leads to a high incidence of disease, for example) might favour forest margin production as trees can be inter-cropped and integrated into a mixed farming system. Similarly, multi-purpose trees, or particular attributes of the trees, might bring benefits to the complex forest fringe farming system which are not needed or realized in more intensive systems.

Appraisal of these factors requires farmer-level surveys and should include a mix of informal methods (particularly scoring and ranking, and seasonal diagramming) and more formal approaches (such as gross margin analysis).

SCOPE FOR PROCESSING OF NTTPS

This topic merits particular attention because many projects assume that local processing will provide the solution to problems of low volume, irregularity of supply, perishability, and lack of employment opportunities. However, the establishment of sustainable processing operations may be particularly difficult and should certainly be thoroughly researched before making any investment.

Clearly, any processing operation needs to be appraised to determine whether it is financially feasible, but even this usually mechanistic task is unlikely to be straightforward. If a project is seeking to introduce NTTP processing to a rural community, the first issue will concern the business unit. The unit of operation (a group, individuals, etc.) and the costing of the component operations (whether production and processing are to be treated as an integrated operation, or whether each is to be treated separately) will need to be determined. Box 2 lists the type of information required for the financial appraisal of agro-processing operations. The initial appraisal should then be re-run to test the effect of changes in the value of variables which are particularly critical to the operation, or which are particularly uncertain or variable. The lack of information on NTTP markets discussed above and hence, the considerable degree of uncertainty, may well generate inconclusive results.

There are many other issues which need to be considered when appraising an NTTP processing operation (see Conroy *et al.*, 1995). These include:

- the presence and sustainability of any 'hidden' subsidy associated with a particular market outlet or NGO involved in the operation;
- the objectives, experience in business, cohesiveness and hence, sustainability of groups considered to be potential business units;
- access to capital (including working capital requirements), markets and traders, market information and transport; and
- how risk factors are to accommodated and by whom.

Existing processing operations in Cameroon showed that most NTTPs are subjected to a minimum of processing or handling and that most of this is of a traditional nature

BOX 2 FINANCIAL ANALYSIS – A SELECTION OF KEY COMPONENTS

Raw materials
- Cost (at plant)
- Need for farm gate or rural collection
- Yield (e.g. oil from oilseed)
- Quality (mould, dirt, etc.)
- Need for mixture with other materials to bulk-up
- Volume of supply
- Seasonality
- Variability in any of the above in time or space

Plant
- Initial cost
- Availability of skilled labour to operate/maintain
- Availability and cost of spare parts
- Availability and cost of labour for repairs
- Number of people needed (operator skills)

Working capital requirement

Output targets
- Availability and reliability of electricity, water and diesel
- Number of hours/days of plant operation
- Efficiency in feeding raw material to plant
- Daily time management (e.g. staggering of breaks)
- Downtime and speed of resolving problems
- Raw material factors (listed above)

Revenue
- Quantity of output
- Quality of final product (appearance etc)
- Prices received

Source: Conroy *et al.* (1995).

(such as storage, the use of wrapping leaves, and the chopping of leafy vegetables at the point of retail). As a general rule, there may be more potential for developing processing methods which resemble the activities already in place than for starting something entirely new.

In Cameroon, the obvious exception to this is the gathering and processing of *Prunus africana* bark (at a modern plant near the production area) for export as a high value pharmaceutical. The investment costs and market integration of this operation are rarely, if ever, likely to be realized by community-based processing initiatives; commercial investment in such plant is only likely if there is a high value export market, or a large domestic market, for the processed product. In Cameroon, there are few, if any, examples of products which fall between the two extremes of locally traded, low-volume, minimally processed traditional products and *Prunus africana*, but in Brazil, whose large population includes a substantial urban middle class, a number of forest products find local markets as processed pharmaceuticals and cosmetics.

RECOGNIZING WHERE MARKET DEVELOPMENT MAY NOT IMPROVE PRODUCER INCOMES

Poor information flow may inhibit the efficient operation of markets. This may be manifested either by price differences (in time or space) which exceed the costs of waste, spoilage, and moving products from one market to the other, or by the lack of price premia for quality at farmer-level whereby good quality commands a higher price at retail level. Researchers can ask traders and producers what they know about prices and how they access that information. It should be relatively easy to determine the accessibility of the information and whether it concentrates market power with certain actors in the market chain. If producers appear to be particularly disadvantaged, it should be possible to determine whether the situation can be remedied and how, or whether it is virtually intractable, given the local circumstances.

Similarly, dispersed, low-volume goods produced or extracted by relatively poor populations may be predisposed to monopsony power by traders (because producers may have little choice of who they sell to). This situation is likely to be exacerbated if traders offer advances and credit to suppliers which 'lock' them into disadvantageous price agreements. Researchers should ensure that they probe this issue; it will certainly have implications for the impact of any NTTP marketing initiative and may highlight the need for alternative sources of credit or other interventions. Poorly researched interventions may inadvertently exacerbate income disparities.

While secondary data on forest products may be scarce, it should be possible to collect information on the government interventions which affect the forestry sector, although imminent changes in policy may not always be apparent. Researchers should take care to distinguish between theory and practice (for example, apparent restrictions on the harvest of certain products compared to actual enforcement, and possible changes in enforcement resulting from international pressure, donor conditionality, etc.). Similarly, it is important to anticipate the effects, for example, of an expansion in the feeder road network or changes in export concessions. This requires access to key, up-to-date policy documents, or discussions with appropriate individuals in the public sector, neither of which may be readily available.

The price and availability of substitute products must be considered in any analysis of market potential. These may include imported products, some of which may be subsidized or available at irregular intervals (reflecting seasonality, the timing of shipments, or food aid deliveries). Interventions should take account of distortions in the international market which might affect the market for certain NTTPs. Ironically, distortions which may temporarily have a positive effect on the NTTP market (for example, hidden subsidies or elevated prices associated with the purchase of products by an NGO or a quasi-philanthropic commercial concern), may prove unsustainable in the medium term.

Conclusions

The links between NTTP markets, forest conservation and economic development have been discussed. Efficient markets for tree products may encourage conservation by increasing the value of forests, provide an incentive to improve land-use practices, provide a means of expanding rural employment opportunities and improving the supply of rural produce to urban markets, and provide raw materials for the development of small- and medium-scale industry. However, the characteristics of NTTP marketing systems should be carefully considered when appraising development options. The striking contrast between the apparent diversity in Africa and the larger scale and more intensive production systems highlighted by IFPRI's parallel research on NTTPs in Brazil is noted.

The dearth of secondary data rapidly leads researchers to the collection of primary data. Informal data collection methods are most useful because lack of prior knowledge of the market system makes it difficult to set appropriate questions and draw random samples. Formal surveys may be preferred for collecting important quantitative data but preliminary informal surveys may be necessary to provide the required background information. The analysis of market information is usually directed towards understanding the demand for a product or understanding how the marketing system works. Although preliminary analysis may lead to the early elimination of unpromising products, greater skill is required to determine whether an apparently marketable product has real potential. Many NTTPs have small markets which may not be robust enough to withstand significant changes in production or marketing.

Certain strategic issues which may undermine the anticipated benefits of market development include the implications of low-volume markets, factors affecting scope for domestication and processing, and factors constraining the potential to improve producer incomes through market development. The importance of these issues varies with product and location, but they merit careful consideration in the appraisal of NTTP marketing initiatives because they can significantly limit development impact.

The quotation in Box 3 is taken from a paper which sought to compare the value of non-wood forest resources from 1 ha of forest in Peru with timber resources from the same tract of land. The paper underlines some of the points made here, including the low profile of multiple small-scale producers and traders, the problems with mechanistic approaches to market assessment, and the potential difficulty in reconciling development and conservation objectives. It might be concluded that NTTP markets offer

BOX 3 AMAZONIAN NTTP

"Without question, the sustainable exploitation of non-wood forest resources represents the most immediate and profitable method for integrating the use and conservation of Amazonian forest. Why has so little been done to promote the marketing, processing and development of these valuable resources?

We believe that the problem lies not in the actual value of these resources, but in the failure of public policy to recognize it. Tropical timber is sold in international markets and generates substantial amounts of foreign exchange; it is a highly visible export commodity controlled by the government and supported by large federal expenditures. Non-wood resources, on the other hand, are collected and sold in local markets by an incalculable number of subsistence farmers, forest collectors, middlemen and shop-owners. These decentralized trade networks are extremely hard to monitor and easy to ignore in national accounting schemes." (Peters *et al.*, 1989).

a viable alternative to timber extraction, but the assumptions implicit in such a conclusion are unlikely to hold if NTTP production and marketing are scaled up significantly.

The comparison of revenues provided by Peters *et al.* (1989) is based on (a) average retail prices for different forest fruits in an urban produce market 30 km from the production area and (b) observed prices for currently traded timber volumes. If there was a significant switch of forest use from the extraction of timber to NTTPs, lower prices for NTTPs would be expected while timber prices would rise. Although it is important for governments to recognize the importance of non-timber forest use, the analysis does not provide enough information to support the claim that NTTP extraction is more profitable than timber extraction.

However, Peters *et al.* (1989) are implicitly concerned with two objectives relating to livelihoods and conservation. They stress that non-wood forest resources may offer most promise to integrate ". . . the use and conservation of Amazonian forest". Reconciling these two objectives is methodologically and practically difficult. The analysis makes use of standard discounting techniques to arrive at a comparison of net present values, but uses a discount rate of only 5% which would tend to downplay current revenues (i.e., those from timber) relative to long run income streams (as might be generated by the sustainable harvest of non-wood forest resources). Although this might be appropriate from an environmental perspective, farmers and extractivists may place a higher priority on current consumption and income and expect a higher return on their capital (the discount rate should approximate to this), suggesting that they may be less interested in the extraction of non-wood forest resources than the analysis implies.

Transport costs for fruit are based on previous studies conducted in the area. However, if production and marketing of NTTPs increased significantly, the transport costs associated with the supply of more distant markets (to absorb greater volumes), or with the extraction of products from less accessible parts of the forest, might be higher. These potentially higher costs would have to be considered against possible economies of scale in transport.

The complex issues which determine the livelihood strategies of farmers and extractivists are not considered; only the wage costs of extraction are mentioned.

The problem with 'multiplying up', particularly in view of the minor nature of so many individual forest products, highlights the need for caution in any programme aimed at the domestication of wild species, and the importance of a mixed 'basket' of products to farmer/extractivist livelihoods. Sustainable agroforestry initiatives in the forest margins need to recognize that there are few miracle tree crops with scope for widespread adoption and marketing.

Bibliography

ANONYMOUS (1992) Non timber forest products defined. *Unasylva,* **165** (42): 3.

CONROY, C., GORDON, A. and MARTER, A. (1995) *Development and Dissemination of Agroprocessing Technologies.* NRI Socio-economic Series 8. Chatham, UK: Natural Resources Institute.

DEWEES, P. and SCHERR, S. (1994) Public policy and NTTP market research: issues and approaches. Paper prepared for: *the Workshop on Non-Timber Tree Product Market Research, December 1994.* Washington DC: IFPRI/CIFOR/ICRAF/NRI.

FALCONER, J. (1990) The major significance of "minor" forest products: the local use and value of forests in the West African Humid Forest Zone.

FEREDAY, N., GORDON, A. and OJI, G. (1997) *Domestic Market Potential for Tree Products from Farms and Rural Communities: Experience from Cameroon.* NRI Socio-economic Series 13. Chatham, UK: Natural Resources Institute.

MAGRATH, P. (1992) *Methodologies for Studying Agricultural Markets in Developing Countries.* Marketing Series 2. Chatham, UK: Natural Resources Institute.

PADOCH, C. (1988) *Advances in Economic Botany,* **5**: 74-89.

PAPADOPULOS, V. and GORDON, A. (1997) *Non-timber Tree Products: A Partial Inventory of products Available in the Mount Cameroon Area.* NRI Socio-economic Series 11. Chatham, UK: Natural Resources Institute.

PETERS, M., GENTRY, A.H. and MENDELSOHN, R.O. (1989) Valuation of an Amazonian rainforest. *Nature,* **339**: 655-656.

SCOONES, I., MELNYK, M. and PRETTY, J.N. (1992) *The Hidden Harvest - Wild Foods and Agricultural Systems. A Literature Review and Annotated Bibliography.* London: International Institute for Environment and Development.

SIMMONS, R., GORDON, A. and CROPLEY, J. (1994) Characterizing markets: basic research tools and methods and their application to NTTPs. Paper prepared for: *the Workshop on Non-Timber Tree Products Market Research, December 1994.* Washington DC, USA: IFPRI/CIFOR/ICRAF/NRI.

WITCOVER, J. and VOSTI, S. (1995) *Workshop on Non-Timber Tree Product Market Research - Environment and Production Technology Division Workshop, Summary Paper No. 3,* November 1995. Washington DC: IFPRI.

Appendix 1 Data requirements and tools of market assessment

Two basic categories of information are required for assessing markets: information which describes the market; and information which describes the marketing system. Put simply, the former should influence which product is marketed, and the latter should indicate whether the market is efficient, and whether it is likely to be possible to enter into trade with product *x*. Although this categorization is useful conceptually, in practice, there may be some overlap. Both categories are relevant to the design and implementation of forestry and agroforestry interventions; in the extreme, the focus of an ostensibly forestry project could be an intervention aimed at improving the efficiency of the market.

INFORMATION WHICH DESCRIBES THE MARKET

If a project is likely to result in an increase in the quantity of product *x* being marketed, it is important that the characteristics of that market are understood before the project plans are finalized. Information requirements are briefly described below.

Volumes and sources of supply

Volumes traded, past and present (and any qualitative or quantitative information on subsistence use). Information is included on existing supply sources, such as seasonal variations, market share of different suppliers or supplier categories, and product differences.

Prices

Prices, past and present. This includes qualitative or quantitative information on the factors which influence price, such as time or place of sale, and seasonal, cyclical, festival, or apparently random influences. It is also important to probe the effect of increased supply on price (price elasticity of demand) to determine whether any increase in supply would be absorbed by the market at a 'reasonable' price, or whether a dramatic fall in price would be necessary to encourage additional consumption.

Product specifications

Quality, size/weight, visual, processing and packaging requirements or preferences. (Note that the market for product *x* may be sub-divided according to different product specifications, in which case, it is important that this is recognized in respect of the information on price, volumes, etc.)

End-use and consumers

How the product is used, by whom, and in conjunction with which other products (e.g. certain herbs may be used in certain soups by people on low incomes from a particular area). Any products that directly compete with product *x* from the consumers' point of view (and factors influencing supply and price) should be listed. The relevance or availability of specific qualitative information will vary according to product.

Market area

The geographic boundaries of the market under consideration should be described, along with an indication of source areas. If several markets are being considered (e.g. local rural markets or distant urban markets), this should be reflected in the information on price, volumes, etc.

Licensing, practices, trade associations, regulations

The official or customary practices affecting trade in product *x* (which may be non-existent for many products). Proposed changes to these, such as environmental legislation which might limit the harvest of certain products, should be noted.

Seasonality

Any seasonal influences on the market which affect demand or supply should be indicated.

Trends

For each category of information listed here it is important to gain an understanding of trends, such as whether consumer preferences are changing, whether the supply is becoming more limited, or whether another cheaper product is increasingly being substituted for product *x*.

Risk and uncertainty

It is also important to identify any sources of uncertainty or risk. These can be sub-divided as follows:

(a) risk – where the probability of event *x* is known (e.g. crop failure occurs one year in three);

(b) uncertainty – where the probability of events which occur is unknown (e.g. tree crops affected by disease);

(c) information gaps – where the information collected is patchy, inconsistent or otherwise inadequate (e.g. contradictory information on the best storage methods to assure quality of end-product).

These 'unknowns' should then be factored into project planning to provide 'best/worst case scenarios'. Information gaps should be filled as soon as possible.

INFORMATION WHICH DESCRIBES THE MARKETING SYSTEM

Market chain

Information on existing marketing arrangements, or the actors which, through wholesaling, transportation, storage etc., link suppliers with markets. The complexity of market chains will vary significantly by product. Detailed information on the market chain may permit estimates of the market share of different participants and marketing margins/costs. The location and type of retail outlet should also be described (e.g. small stores in towns and villages, weekly markets, daily markets, etc.), with an indication of the market share of each. Any influence this has on price, quality, etc. should be indicated where relevant.

Indicators of competition and efficiency

It is possible to gauge the competitiveness of a market or market system by looking at several factors such as information flows, the number of participants at each 'level' in the chain, barriers to entry, and marketing margins. An uncompetitive market might be indicated by particularly high investment costs limiting entry into trade with product *x*, factors that concentrate market power in the hands of a few (such as access to information or capital), or apparently high marketing margins not explained by high costs or high risk. An efficient market will be characterized by the availability of information which will contribute towards smoothing prices between different markets (so that a number of traders will move to supply a high-price, under-supplied market and help reduce prices).

Assessment of marketing margins and costs is often difficult because researchers rarely have access to all the relevant information (hence the need to consider a number of different factors), but access to capital and credit, working capital needs, and risk factors, are all important costs which should not be overlooked. Consideration of these aspects should also indicate how prices are set, whether they seem to respond to competitive market forces, or whether other factors affect pricing levels.

Transport and infrastructure

Market access will also be affected by the transport and infrastructure available. Consideration should be given to the presence and adequacy of the roads (and whether access is seasonal or year round), access to transport in the relevant areas, and the availability of dedicated

marketing infrastructure, warehousing, etc. In the case of forest products, the legal context should also be considered as their extraction may encroach on environmental or conservation policy.

Processing and handling

The product should be carefully described, indicating how it is handled, stored, packed and processed, and how these processes change at each stage in the marketing chain (including unit of sale). Inputs (and sources) should be identified, along with particular risks or uncertainties affecting processing and handling.

Institutional analysis

It is important to consider both the formal and informal institutional aspects of the market chain. For instance, there may be ethnic links throughout the chain, or gender-differentiated tasks. There may be formal or informal trade associations, or even a public depot or marketing agency. These institutions influence access so careful consideration should be given to their role, whether all trade in product x is subject to the same institutions, and how sustainable they are. In the case of public agencies and the involvement of third parties (NGOs, or even quasi-philanthropic private commercial interests), any hidden subsidies should be identified.

Recent economic reforms in Africa and elsewhere, which have focused attention on markets and how they function, have led to changes in both public and private marketing institutions. Even though NTTPs have been traded informally and privately outside the more mainstream market channels which have been the focus of the reforms, they may still experience knock-on effects from the policy changes. For example, they may be affected by the freeing up of export trade, availability of feeder roads, or increased (and possibly predatory) marketing by traders previously focused on other products.

TECHNIQUES AVAILABLE FOR MARKET ASSESSMENT

Table 2 summarizes the techniques available for probing given categories of market information. If all these categories were investigated, too much data would be collected (in view of the relative insignificance of many individual NTTPs). The researcher therefore needs to exercise skill and discretion in the use of informal methods to probe potential at an early stage before delving further.

Table 2 Marketing study techniques

Characteristic	Techniques	Comments
Market location	Group interviews with administrators/ government officials/marketing officers/counterpart organization/ large traders	Generally required to find out background to market and how to proceed. Short interviews with a large number of people with different perspectives is useful.
Market size	Formal surveys of different entry points to market, i.e., transportation, wholesalers Census Key informants, i.e., chairman of traders' association Focus groups for history of market using different stages of marketing chain	Formal surveys can provide the most accurate information.
Market infrastructure	Formal survey of traders Direct observation Group interviews Individual interviews	Information across respondents is likely to be similar. Direct observation and informal interviews are useful.
Income and employment	Formal survey In-depth interviews Key informants Secondary data	Employment information is sometimes available in government (national or regional) statistics. Key informants at various stages of the marketing chain can be useful. Information on income can be difficult to obtain from formal studies. In-depth studies can provide more information, although income data are always difficult to obtain.
Quality, packaging, handling characteristics	In-depth/group interviews at different stages of the marketing chain Direct observation	
Seasonality of production	Sequential interviews Key informant/in-depth interviews/ seasonal diagramming, formal survey/ questionnaires	Seasonal information can be difficult to obtain from one visit. Sequential interviews across seasons are best although not always practical. Key informant interviews can be useful if respondents keep records.

Characteristic	Techniques	Comments
Consumer preferences and substitutes	Interviews with wholesalers and retailers Focus groups with consumers Formal survey with consumers	Detailed information is best obtained by either focus groups or formal interviews. Consumers should be stratified into groups with common characteristics.
Marketing channels	Key informants, i.e., chairman of trade association, marketing officers Chain interviews Formal survey	Chain interviews can be difficult if intermediaries are a long way apart. Chains may be unrepresentative. Formal survey requires prior knowledge of the marketing system.
Government involvement	In-depth interviews with government officials and parastat officers Group interviews with farmers and market intermediaries	
Prices	Secondary data of market prices Formal or informal interviews across marketing chain	Price data notoriously problematic and should be rigorously cross-checked.

Source: Adapted from Simmons *et al.* (1994).