Forest Products, Livelihoods and Conservation

Case Studies of Non-Timber Forest Product Systems

VOLUME 2 - AFRICA

Editors
Terry Sunderland and Ousseynou Ndoye

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Foreword

His Excellency, Henri Djombo
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and the Environment of the Republic of Congo

President of the Conference of Ministers in Charge of Forests of
Central Africa (COMIFAC)

Several authors have highlighted the importance of Non-Timber Forest Products (NTFPs) in the livelihoods of forest dwellers in Africa. These products, namely fruits, nuts, leaves, barks, cane and bushmeat in particular, have been used for centuries as food and medication by African forest dwellers.

The collection and sale of NTFPs is mainly the activity of poor populations and small traders. As a result, any action aimed at developing the NTFP sector will contribute to poverty alleviation in the same way as it does to the development of the agricultural sector.

The economic crisis of the 1980s in Africa, which resulted in the decline in the profitability of cocoa and coffee production on the international market, prompted the majority of farmers to diversify their sources of income by collecting and selling NTFPs in order to minimize the risks related to agriculture. The economic potential of NTFPs for poverty alleviation is very high compared to traditional cash crops such as coffee and cocoa. Research by the Center for International Forestry Research (CIFOR) has shown that the prices of certain NTFPs could compete with those of cocoa and coffee.

The lack of harmonization of the methodological approaches used in the past did not allow for a comparison of the case studies carried out on NTFPs in various parts of the continent and between Africa and other continents. CIFOR took an unprecedented step by initiating the project on World Comparison of NTFPs, financed by DFID. This project is based on 61 case studies, including 17 in Africa. The lessons learnt from the project were very beneficial to the researchers involved, and put their case studies in a global perspective. It is certain that in Africa, researchers who work on NTFPs do so in isolation. This does not enable them to exchange or learn from other researchers in the same field. The CIFOR project allowed various researchers

involved to interact for the first time, especially during workshops organized on each continent, and through the web sites created for this purpose.

There is no doubt that this volume, which is devoted to Africa, will help in guiding investments and decision making on NTFPs in the continent for years to come. This volume highlights the important role of NTFPs in the well being of millions of Africans, and it is also the basis of a plea to African governments to work together towards securing the access and property rights of populations. It also indicates the need to improve the performance of markets with a view to intensifying and diversifying viable local economies that have strong bases in national and regional networks. This will contribute to the emergence of a situation where forest resources will be preserved and the livelihoods of populations will be improved (a win-win situation). In my opinion, this intensification and diversification would be attainable in a sustainable way if the domestication of NTFPs were carried out at the same time and on a large scale, thus allowing rural communities to integrate trees into their farming systems.

The publication of this volume is very timely as COMIFAC, CEFDHAC and other sub-regional organizations plan to organize important meetings in 2004.

Foreword

J.E. Michael Arnold

Products other than timber and other industrial roundwood have always constituted a large part of the forest economy in developing countries. Individual products provide inputs and income directly to huge numbers of rural and urban households. In many countries the aggregate of non-timber forest products (NTFPs) contributes as much, if not more, to national product as industrial roundwood. However, their designation as 'minor' forest products reflects their relative neglect until quite recently. Produced and consumed largely outside the monetary economy, they attracted only limited attention and even less in the way of measurement and research.

The recent increase in interest in NTFPs has been a consequence of a number of shifts in developmental focus. With the evolution in thinking about the importance of rural development and poverty alleviation has come growing interest in how forests and forest products contribute to households' food and livelihood security. Within this framework forest product activities have begun to attract particular attention as being often one of the larger income-generating components of the non-farm part of the rural economy. In recent years this interest has been reinforced by shifts in development policy and strategy towards more market driven activity within this part of the economy.

At the same time, concerns that development activities be consistent with environmental integrity, and not prejudice the future potential of forest and land resources, have highlighted arguments that managing them for NTFPs might be less environmentally damaging than alternative uses of forests. In addition, the policy shifts that encourage devolution of control and management away from central governments to local institutions have drawn more attention to NTFPs as a potentially important incentive to local forest management.

However, the state of knowledge about these aspects of NTFP activities has not kept pace with this emerging and evolving perception of their

increased importance. Though quite a lot is known about the characteristics of many individual products, much less is known about their commercial performance and developmental linkages. Consequently, we are still at a quite early stage in the process of establishing general patterns of NTFP activity that could help us understand the factors that determine the circumstances in which they are or are not likely to be commercially successful and appropriate.

This knowledge is so rudimentary not only because of the low priority attached to NTFPs in the past, but also because of the complexities of researching and understanding such a highly diverse group of products, produced in such a wide range of different ecological and socioeconomic situations. Some are generated within predominantly subsistence livelihood systems, in order to generate the limited amounts of cash income needed to fill seasonal gaps or tide households over hard times. Others form part of livelihoods that are integrated into the market economy, and can form important and growing sources of household income and improvement. Many NTFPs are goods that fall out of use as incomes rise, or that can no longer compete when more efficiently produced alternatives become available in their markets. Others, in contrast, face expanding markets and generate attractive returns. Consequently greater exposure to market forces may disrupt or even overwhelm some NTFP trades, while offering new or expanded opportunities for others. It is therefore important to understand more precisely the factors that shape such possibilities and threats, in order to be able to identify what types of intervention might encourage the one, or help avert or alleviate the other.

There are also different scenarios to be considered on the supply side. Some NTFPs are extracted from existing 'wild' resources, others are produced from forest resources under some form of management, while still others are outputs of cultivated tree resources within a predominantly agricultural environment. Issues that we may need to know more about include how different forms of management relate to the different roles particular NTFPs play in the associated livelihood and socioeconomic system; the extent to which different NTFP production systems conform to conservation objectives and concerns; and the capacity of existing governance mechanisms to effect desired outcomes.

These three volumes represent one output from a substantial pioneering exercise designed to help fill some of these gaps in our present knowledge base. The study set out to determine what patterns of interaction between factors such as those mentioned above can be discerned from existing information, based on comparative analysis across a substantial number of different products in different situations in Africa, Asia and Latin America. This is not a random, or necessarily representative, sample of case studies. Their choice reflects the availability of the needed information, but the selection covers a wide range of product, circumstance and situation.

The analysis of information provided by this body of work has shown that important patterns can be identified. These are summarised in the introduction chapter of Volume 1. Each volume complements this comparative

analysis by providing a descriptive account of each case study that was contributed from a particular geographical region, prepared by the researchers involved. Together they provide a wealth of information about individual NTFPs and the situations in which they are being produced and traded, and indicate the extent of the research base drawn upon in the course of this important exercise. It is to be hoped that it will provide a starting point for further research and analysis to continue the process of improving understanding of the potentials for NTFP activities to contribute successfully to livelihood enhancement and sustainable forest use.

Chapter 1

Commercialisation of non-timber forest products in Africa: history, context and prospects

Terry C.H. Sunderland, Susan T. Harrison and Ousseynou Ndoye

INTRODUCTION

Since the 1970s, non-timber forest products (NTFPs) have emerged to take their place among the many aspects of forest use that guide natural resource decision-makers. In the early 1990s, NTFPs were mooted as a potential alternative to deforestation and land conversion activities (Falconer 1990; Plotkin and Famolare 1992). Some NTFPs have strong market value and it was postulated that the long-term value accruing from the harvest of these products could override the short-term gain of converting that forest or individual trees to other uses such as timber, agriculture, or plantations (Peters *et al*. 1989; Godoy and Bawa 1993). The attention of both the conservation and the social development communities was captured, and it was put forward that through the harvest of NTFPs, the often marginalised forest peoples of the world might capture valuable income and social benefits, whilst the aim of conserving of natural forests was achieved. If this were indeed the case, then the development and formalisation of the NTFP sector could at once meet the often-contradictory goals of development and conservation.

This optimism, however, was based on exaggerated claims of economic potential which were often over-simplistic assessments of 'value' (Southgate *et al*. 1996) and a limited evaluation of the complexity of economic, social and market oriented issues surrounding the NTFP category (Lawrence 2003). The advocating of increased commercialisation of forest products for rural livelihoods has also been questioned, and it is argued that many households barely cover the opportunity costs of collection, even for high-value forest products (Southgate *et al*. 1996) with the majority of the income accruing to those who transform the product or local élites who control the market (Dove 1993).

Despite these concerns NTFPs can form an integral part in conservation and development strategies (Ogle 1996), but this can only be undertaken with the full knowledge of a range of interlinked issues and requiring a multidisciplinary approach which incorporates social, economic, cultural, ecological and policy

contexts, so often missing in integrated conservation and development projects (Lawrence 2003). To date, and despite massive investment in the NTFP sector, a number of basic conceptual issues remain unresolved in order to better position NTFPs within conservation and development strategies (Ruiz-Pérez and Arnold 1996; Arnold and Ruiz-Pérez 1998).

To that end the Centre for International Forestry Research (CIFOR) developed the project 'Assessment of the potential for non-timber forest products–based development', which is an attempt to address this problem and to improve our understanding of NTFP systems through a comparative and formal analysis of a wide range of case studies of forest product development (Ruiz-Pérez and Byron 1999; Belcher and Ruiz-Pérez 2001). A standardised set of descriptors was developed to capture the key ecological, technological, socio-economic and institutional aspects of forest resource production, processing and trade.

The goal of this NTFP Case Comparison project is to:

- Create typologies of cases
- Identify conditions associated with particular kinds of development and conservation
- Develop and test hypotheses about forest product development

Collaborators from 27 countries, representing 47 institutions in Africa, Asia and Latin America were identified and recruited, contributing a total of 62 case studies to the analysis. The criteria for selecting individual cases included:

- That the forest product has demonstrably significant commercial and trade value (i.e. it is traded in the cash economy)
- That the production, processing and marketing system has been subject to prior research, with data available on at least 70% of the variables
- The presence of an individual or team of researchers willing to collect additional data to complete the case study documentation and to participate in the comparative analysis
- The need to include an adequate representation of a wide range of cases

This chapter discusses the multidimensional issues surrounding NTFPs in Africa through a summary of the 17 cases undertaken by researchers across the continent as part of the Case Comparison project, which are presented in this book. The subsequent chapters are grouped according to the end use of the particular NTFP: (i) medicinal, hygiene and cosmetic plants; (ii) fruits and oils; (iii) woodcarving and wood products; (iv) fibres and weaving products; and (v) animal products. The location of each case is presented in Figure 1. The most important characteristics of each case are presented in Table 1.

Background to the Case Comparison project in Africa

Seventeen case studies were performed in 10 different African countries on NTFPs with a range of production, processing and marketing characteristics. Each of the 17 NTFPs chosen has been commercially traded for at least half a century or, in the case of chewsticks (*Garcinia* spp.) and shea butter (*Vittelaria paradoxa*), for hundreds of years, and each product reveals strong annual sales figures, often in the US$ millions.

The life forms represented by the case studies are as follows. Twelve are trees (including one arboreal palm), three are climbing palms (rattans), one is a perennial herb and the last is an animal (elephant) product. With only one exception (*Dacryodes edulis*) the majority of the cases originate in the wild or are managed in a wild situation (*Vitellaria paradoxa* and, in certain instances, *Garcinia kola*).

However, as in Latin America (Alexiades and Shanley 2004) and Asia (Belcher and Kusters 2004), the availability of comprehensive information on high-value NTFPs in Africa is somewhat scanty and selection of the cases was undoubtedly subject to bias, particularly product-oriented and geographical. It is clear that often more information is available for widely commercialised species and this disparity may have led to bias on the selection of the product type. For example, six of the case studies presented are of wood products—four of woodcarving and one each of chewing sticks and fuelwood—meaning that over one third of the NTFPs cases presented rely on the felling and removal of the entire individual as in timber exploitation. In this instance, this selection may imply that the perceived NTFP paradigm of 'sustainable harvest' is not necessarily represented by these cases and the destructive harvesting techniques employed are probably not wholly representative of the African NTFP sector, which focuses on a much wider range of products than those that are wood-based.

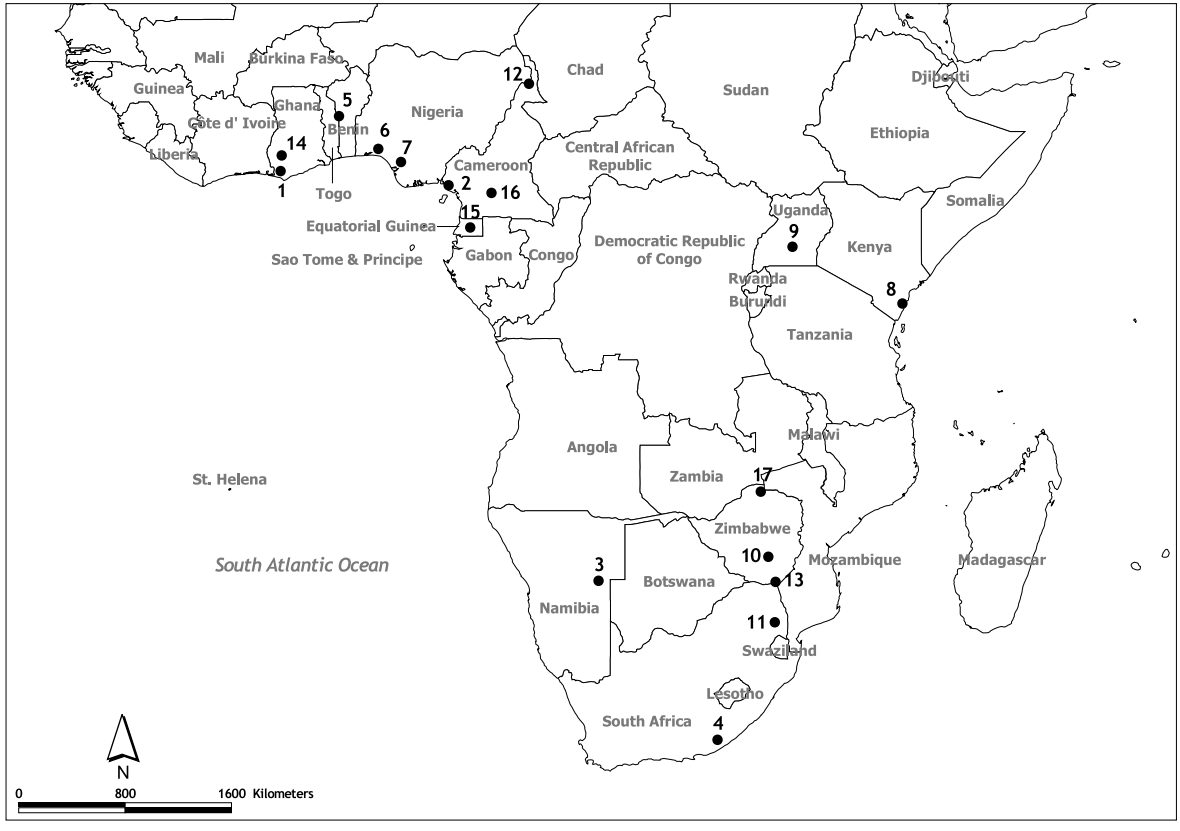
In addition, geographical bias is evident in the selection of the cases presented in this volume, since over 80% of the studies originated from central, southern and eastern Africa. Undoubtedly this reflects the long history of forest and woodland resource research and the advanced nature of our knowledge of the forestry sector within each region. Despite this bias, with the inclusion of a number of varied products from a wider geographic range, the 17 cases present a diversity of products, management practices and trade regimes that are relatively representative of the African NTFP sector.

Devil's claw (*Harpagophytum* sp.) highlights quality control and cultivation in relation to NTFPs, particularly for medicinal use where strict regulatory measures are increasingly imposed for exported devil's claw roots. The Sengwe palm (*Hyphaene petersiana)* was chosen because of its long history of use and coordination of studies completed on the palm use in the basket trade since 1993. While scarcity of NTFPs is not prevalent in all our case studies, it is of major concern for resources such as chewsticks in Ghana (*Garcinia spp.)* and *Pterocarpus angolensis,* which are facing scarcity issues. *Prunus africana,* which is internationally recognised by the Convention on the International Trade in Endangered Species of Flora and Fauna as an endangered species because of overexploitation, is probably the most endangered species in this study.

THE HISTORICAL TRADE OF NTFPS IN AFRICA

Trade patterns are historically deep rooted in Africa and have heavily influenced the economic development of the continent. The conquest of North Africa by Arab peoples in the seventh century led to the development of many trade links (Townson 1992). These included the extensive trade routes across the Sahara and those along the East African coast, where the seasonal shifts in monsoon winds determined the movement of small sailing vessels that carried people

Figure 1. Location of the case study areas



Source: ESRI Data and Maps 2002.

Table 1. Important characteristics of the cases

no.	country	species	common names	part of the resource used	dominant form of management	transformation*	scale of trade	national trade and export**	geogr. range***	authors
1	Ghana	*Garcinia kola; Garcinia epunctata*	Tweapeah, nsorkor	stem	wild	low	international	medium	medium	Blay, D.
2	Cameroon	*Prunus africana*	Pygeum, Red stinkwood, Wotango	bark	wild	high	international	medium	small	Ndam, N. and Tonye, M.
3	Namibia	*Harpagophytum procumbens*	Devil's claw, Arthritis root	root	managed	high	international	medium	medium	Wynberg, R.
4	South Africa	*Cassipourea flanaganii*	Umemezi	bark	wild	low	national	low	small	Cocks, M.L. and Dold, A.P.
5	Benin	*Vitellaria paradoxa*	Shea, Karité	kernels	wild/ managed	high	international	medium	large	Schreckenberg, K.
6	Nigeria	*Garcinia kola*	Bitter cola, Orogbo	seeds	wild/ managed	low	national	low	medium	Adebisi, A.A.
7	Nigeria	*Dacryodes edulis*	Safou, Bush pear, Orumu	fruit	managed/ cultivated	low	national	low	medium	Adewusi, H.G.
8	Kenya	*Brachylaena huillensis*	Mahogany, Muhu	wood	wild	medium	international	high	medium	Choge, S.K.
9	Uganda	*Polyscias fulva*	Mutati, Parasol tree, Setaala	wood	wild	medium	international	low	medium	Omeja, P. *et al.*
10	Zimbabwe	*Afzelia quanzensis*	Afzelia, Pod mahogany, Mukamba	wood	wild	medium	international	low	large	Standa-Gunda, W. and Braedt, O.
11	South Africa	*Pterocarpus angolensis*	Kiaat, African teak, Murotso	wood	wild	medium	national	medium	large	Shackleton, S.E. and Shackleton, C.M.
12	Cameroon	*Acacia seyal*	Seyal, White-galled acacia, Ulbe	wood	wild	low	national	low	large	Ijang, T.P.
13	Zimbabwe	*Hyphaene petersiana*	Ilala palm, Ilala	leaves	wild	medium	international	low	medium	Sola, P.
14	Ghana	*Eremospatha macrocarpa; Laccosperma secundiflorum; Calamus deerratus*	Rattan, Mfia, Ayie	stem	wild	medium	international	medium	large	Adu-Anning, C.
15	Equatorial Guinea	*Laccosperma secundiflorum; Laccosperma robustum; Eremospatha macrocarpa*	Aka, Rattan	stem	wild	medium	national	low	large	Sunderland, T.C.H. *et al.*
16	Cameroon	*Laccosperma secundiflorum; Eremospatha macrocarpa; Laccosperma robustum*	Maraca, Rattan, Ékè	stem	wild	medium	international	low	large	Defo, L.
17	Zimbabwe	*Loxodonta africana*	African Elephant, Nzou	elephant	wild	high	international	medium	large	Doré, D. and Bond, I.

* The degree of processing that is required: Low (e.g. fruit, bush meat or other products that can be used directly by the consumer), medium (e.g. fibre from grass used for weaving or handicrafts; wood for carvings); or high (e.g. essential oil extracted from plant and used in incense or as a chemical component in medicine).
** Value of national trade and export in 1998: Low (< 1,000,000 US$/year); medium (1,000,000 - 10,000,000 US$/year); high (10,000,000 US$/year).
*** Geographic range: Total area (global) over which the target species lives: Large (>1,000,000 km^2); Medium (<1,000,000>75,000 km^2); Small (<75,000 km^2).

and trade goods to and from the Persian Gulf, the Indian subcontinent and South East Asia (Iliffe, 1995).

During this period, a number of high-value products were transported from the forested regions of sub-Saharan Africa for consumption and sale in North Africa, Europe and the Persian Gulf region. For example, aside from palm oil and ivory, pepper (*Piper guineense*) and kola nuts (*Cola acuminata* and *C. nitida*) in particular were traded extensively from the Guinea and Akan (Ghana) forests to the sub-Saharan Sudanic belt (Oliver 1999). Shea butter (*Vitellaria paradoxa*) was also an important commodity traded from the region since the fourteenth century (Chapter 6). In the early mediaeval period, another forest product, melegueta pepper or 'grains of paradise' (*Aframomum* sp.) began to be transported to Europe for use as a spice and condiment (van Harten 1967). Its recorded use in Europe as early as 1214, long before direct European trade, is testament to the influence and extent of these trans-Saharan and Arabian trade routes (*ibid.*).

During the sixteenth and seventeenth centuries, Europeans began to explore the African coastlines, both east and west and, aside from their involvement in the lucrative slave trade, realised there was also considerable potential for further 'legitimate' trade (Isichei 1997). An extensive network of trading stations was established at strategic points along the coast, and iron goods, cloth and weapons were transported from Europe and exchanged for spices and condiments, palm oil and ivory (Oliver 1999).

The established trading stations provided steppingstones to colonial expansion and many European powers used their trading influence to annex considerable areas of land during the 'scramble for Africa' from 1870 to 1910 (Packenham 1991; Iliffe 1995). The colonial period was characterised by the trade of non-timber plant resources such as tea, coffee, cocoa and rubber between the continents (Hobhouse 1999), the commercialisation of which led to the conversion of large tracts of forest lands to plantation agriculture, particularly in the humid tropics, where they have become important contributors to many countries' GDP today.

A number of indigenous forest products became increasingly important during the colonial period and these included rattan cane from West and Central Africa being exported to Europe and other colonies for furniture manufacture (Hédin 1929) along with large quantities of shea butter (*Vitellaria paradoxa*) for the production of margarine and candles (Chapter 6). This latter product became so valuable, that it became a principal component in the agroforestry parklands of Benin described in Chapter 6. In addition, prior to the supply of Brazil rubber (*Hevea brasiliensis*) from plantations, wild sources of rubber for tyre manufacture were highly valued and the exploitation of native African rubber (*Funtumia elastica*) from the Congo Free State led to a brutal and exploitative policy of enforced collection for the brief period the activity was economically viable (Hochschild 1998).

More recently, high-value international markets for a number of NTFPs have developed from migrations of people from Africa, such as in areas of Western Europe and North America which have dense, often prosperous, African populations. These people are prepared to pay a premium for genuine African products, often paying up to 500% more than the local sales price (Clark and

Sunderland in press). Such high-value resources include chewsticks (*Garcinia* spp.) (Chapter 2) and a wide range of other products, particularly spices, condiments and foodstuffs (Tabuna 1999), including bush plum (*Dacryodes edulis*) (Chapter 8). In addition to the supply of NTFPs to the African diaspora in the West, a corresponding increase in tourism to the African continent over the past 20 years has led to increased demand for art and craft items, particularly baskets and woodcarvings—hence the relative importance of the woodcarving and weaving industries as presented in this volume (Chapters 9, 10, 11, 12, 13, 14, 15, 16 and 17). At the upper end of this tourist market, safari hunting based on the premise that local communities share the proceeds of the industry has led to the conservation of the wild elephant resource in Zimbabwe (Chapter 18). In addition, the formalisation of the herbal and cosmetic markets has led to a massive increase in the trade volumes of products such as pygeum (*Prunus africana*) (Chapter 3) and devil's claw (*Harpagophytum* app.) (Chapter 4), together worth some US$320 million annually.

ECOLOGICAL ISSUES

Is NTFP harvest sustainable?

In many respects, and depending on the plant part harvested, the exploitation of wild-sourced NTFPs can be sustainable. However, this requires an understanding of the plant's growth and reproductive characteristics and the application of harvesting practices that permit adequate reproduction or regeneration of the individual organism. Unfortunately even this basic information is woefully incomplete for most taxa. As is evident in nearly all of the case studies presented in this book, growing demand will ultimately intensify the pressure on wild populations. As with any wild plant or animal, if harvesting and mortality exceed annual production, the resource will progressively be depleted and become locally extinct (Cunningham 2000). When the value of an NTFP and the intensity of exploitation are low, human impacts on that species are likely to be minimal. When the value of an NTFP and the intensity of its use are extremely high, however, it is likely that the resource is being overexploited and supplies may become exhausted. For endemic taxa, or those with a limited geographical range, this has serious consequences for the species itself (Cunningham 1999). This is particularly the case with pygeum (*Prunus africana*), which is restricted to montane forest 'islands' across Africa and Madagascar (Chapter 3) and umemezi (*Cassipourea flanaganii*) which is endemic to the Eastern Cape (Chapter 5). In addition, species that are slow-growing, such as the ilala palm (*Hyphaene petersiana*) in southern Africa (Chapter 14) or take many years to become reproductively mature, such as the elephant (Chapter 18) and shea (*Vitellaria paradoxa*) (Chapter 6), are also more susceptible to population decline when overharvested.

In the majority of cases presented in this book it is important to recognise that threats to wild populations of NTFP species predominantly stem from overharvesting pressures and the lack of effective management of the individual NTFP populations, rather than the loss of habitat through logging or conversion to agriculture or accompanying burning[1]. In fact, logging and other forest

disturbances (for example, shifting and mixed agriculture) are not necessarily inimical to NTFP production (Laird 1999). Some NTFPs are found in primary forests, but many, particularly rattan canes, respond extremely well to disturbance and are a common component of secondary forest regrowth (Chapters 15, 16 and 17).

Peters (1994) asserts that harvesting seeds and fruits only adds to what is normally high seed mortality and may not adversely impact plant regeneration[2]. The 'fruits and oils' case studies presented in this book support this theory (Chapters 6, 7 and 8). NTFPs prized for their wood, roots or bark, however, are particularly prone to unsustainable use as harvesting either seriously damages or kills the parent plant. For example, the harvesting practices that partially or wholly strip bark from live trees such as pygeum (*Prunus africana*) and umemezi (*Cassipourea flanaganii*) expose them to ring-barking and exposure to stem-boring insects that can result in considerable postharvest tree mortality (Chapters 3 and 5). Likewise the use of wood products for carving, chewsticks or fuelwood also results in the immediate death of the individual organism (Chapters 2, 9, 10, 11, 12 and 13), as does the sport hunting of elephant (Chapter 18).

Responses to scarcity

As discussed above, higher demand increases pressure on the resource and as resources become depleted three main strategies are employed to militate against shortfalls in supply: (i) to travel further to find supplies, (ii) simply to substitute the particular forest product with a similar product or (iii) to develop more intensive or cultivated sources of supply (Cunningham 2000).

Increased harvesting range. A typical first response to resource scarcity is to increase the harvest range (Cunningham 2000). For example, in all of the rattan case studies presented in this book, it is reported that the first response to scarcity is to travel further into the forest to find adequate supplies of cane to feed the rural and urban markets (Chapters 15, 16 and 17). However, it is commonly found that local harvesters do not factor in the increased opportunity costs of the additional labour needed to collect these resources from a greater distance and that the 'payment received by households [for NTFPs] barely covers the opportunity cost of labour employed in harvesting' (Southgate *et al.* 1996: 1). As the demand for rattan products continues to grow in West and Central Africa, this response will undoubtedly lead to further scarcity and local extirpation[3].

Substitution. In a number of instances, when a preferred species becomes scarce, a similar product is utilised in its place. For example, in the case of chewsticks in Ghana, the preferred *Garcinia* species, *G. kola* and *G. epunctata*, are often replaced with other, less desirable chewstick species (Chapter 2). The same occurs in the case of woodcarving, where indigenous species that have become overexploited are being replaced with fast-growing indigenous or, latterly, exotic species, particularly to supply the thriving Kenyan and Zimbabwean woodcarving industries (Chapters 9 and 10). Indeed, substitution of *Pterocarpus angolensis* with appropriate exotic species is being advocated to militate against the increasing overexploitation of this resource (Chapter 12).

Intensification: is cultivation the answer? Unlike the NTFP resource base in Latin America (Alexiades and Shanley 2004) or Asia (Belcher and Kusters 2004),

the majority of NTFPs in Africa are predominantly wild-sourced. This is further illustrated by the case studies presented in this book, in that only one species, *Dacryodes edulis*, is actually 'domesticated'[4] in the true sense and is widely cultivated in compound gardens throughout Central Africa (Chapter 8). Although shea (*Vitellaria paradoxa*) occurs on agroforestry parklands in Benin, where it is retained within agricultural systems along with other utilitarian species, it is not intensively planted (Chapter 6). Despite the current lack of intensification in the African NTFP sector, many of the case studies presented in this book advocate the encouraging of cultivation to militate against the increasing overharvesting of these products (Chapters 2, 3, 4, 5, 7, 9, 15 and 17). This is often a secondary response to overharvesting (Cunningham 2000). Indeed Homma (1992) suggests that increased demand of a product leads to increased harvest from the wild resulting in the loss of economic viability of the wild resource and encouraging the process of domestication. It appears, however, that the socio-economic and marketing conditions prevalent in the African natural resource sector discourage the transition from wild harvesting to the provision of cultivated sources of supply for a number of reasons elaborated on later in this chapter.

Better management of the wild resource? Without doubt the best prospects for the sustainability of many wild resources are to develop sustainable harvesting regimes grounded in good ecological science coupled with holistic forest management systems compatible with the notion of 'extractivism' (Boot and Gullison 1995). For example, Peters (1994) outlines the necessary six components for the 'sustainable exploitation' of commercially traded NTFPs:

- Species selection
- Forest inventory
- Yield studies
- Regeneration surveys
- Harvest regime assessments
- Harvest adjustments

This model stresses the importance of a constant flow of information about the ecological response of a species to varying degrees of exploitation and that without continuous adjustment sustainable harvesting fluctuates (Peters 1994). The investment in basic research needed to implement such a regime, however, is often too great to be economically rewarding and, as can be seen from the cases presented in this book, such basic knowledge is often missing or incomplete. This is the case not just in the African context but is also prevalent for species that have been harvested and traded commercially for hundreds of years such as Brazil nut (Boot and Gullison 1995). In short, huge investment in long-term ecological research is required to develop sustainable harvesting models of high-value NTFPs from wild populations; research that is notoriously 'unsexy' to donors. This situation, coupled with the need for integrated community-based monitoring systems (Cunningham 2000), examples of which are few and far between, suggests that such a model is almost impossible to implement.

SOCIO-ECONOMIC ISSUES

Household strategies

During the wider analysis of the Case Comparison project, Belcher *et al*. (2003) identified a typology of livelihood strategies for NTFPs and noted clear differences among the three continents in the reliance on forest products by rural and urban households and the importance of such products to them. In our case studies from Africa, the majority of the products (14 out of 17) contribute less than 50% to household incomes and in nine cases, less than 25%. In only three cases did the particular NTFP contribute significantly (more than 70%) to the household incomes. Nevertheless, in many cases this contribution to household income is particularly important at times of economic need, such as the payment of school fees (Chapters 16 and 17), or provides seasonal income when agricultural labour needs are low, particularly in the rainy season (Chapters 7 and 8). There are then stark contrasts in the case studies outlined in this book in that some NTFPs are used predominantly at the subsistence level while others are highly integrated into the cash economy. For example, cases characterised by a 'coping strategy' (that is, integration into the cash economy of less than 50%) are predominantly preoccupied with other agricultural or other natural resource-based activities. Forest products are extracted predominantly from the wild, often in unmanaged, open-access situations; together with agricultural products they provide the main access to the cash economy. These products also provide an important economic safety net through product diversification, and in the context of Homma's model (Homma 1992) these products represent the 'expansion phase' of NTFP economic development.

The three 'specialised' cases are characterised by the respective products providing the greatest contribution to the household economy in the context of a relatively high integration to the cash economy. It is unsurprising that these cases focus on the predominantly urban production of craft materials such as wood carvings (Chapter 12) and rattan baskets and furniture (Chapter 16) and also on the fabrication of specialized hygiene products with a large, well-organised market, such as chewsticks (Chapter 2). However, in light of our case studies, these specialised cases seem to be more of an exception to the rule, and the NTFP sector in Africa is characterised by the prevalence of 'coping strategies'.

Interestingly examples of the 'diversified strategies' identified by Belcher *et al*. (2003) are rare in the African context, as evidenced by the case studies presented here. This may be due to the predominant lack of product intensification of NTFPs on the continent through cultivation or domestication or the relatively low value of wild harvested NTFPs in comparison to other income generating activities such as agriculture.

Tenure issues and product intensification

Sustainable NTFP management or forest conservation plans will need to begin with a clear understanding of local land and resource tenure and access rights. For example, research conducted in Cameroon concludes that even for

economically valuable NTFPs few management techniques are applied under traditional harvest practices (Malleson 1999; van den Berg *et al*. 2001). The case studies in this book serve to emphasize this situation. Overlapping layers of class, education, elite and statutory 'rights' overlying basic traditional tenure systems will affect how innovations and management options are implemented, and together these relationships will play a direct role in management successes or failures.

In many of the case studies described in this book the lack of management regimes is precipitated by the fact that the resources are considered 'open-access', for which there is no customary control on harvesting. Destructive harvesting techniques that increase as market pressure begins to build are often a direct result of situations where property rights are poorly defined or not at all (Dove 1993). Similarly, such insecure tenure discourages the investment in intensification through cultivation and this is particularly characteristic of the African NTFP sector, which is heavily reliant on wild-sourced forest products. It has been argued that even if the open-access problems that lead to destructive harvesting were resolved, increases in the value of NTFPs might not benefit the conservation of tropical forests or the livelihoods of their inhabitants (Southgate *et al*. 1996). The reason given for this partly historical observation is that as an extractive commodity becomes scarce, cultivation outside the natural ecosystem has been a characteristic response. However, often such intensification efforts exclude the original resource users with the majority of resultant profits accruing to local élites or commercial concerns (Dove 1993). In addition, removal of an economically valuable product from the forest economy reduces the value of the standing forest leading to more lucrative, often destructive land-use alternatives (Homma 1992). This situation is particularly highlighted by the devil's claw (*Harpagophytum* spp.) case study where Rachel Wynberg articulately describes the inequity caused by intensification:

> '[With the issue of cultivation] two trends are worth noting. First, there is a high level of competition among projects, evidenced by a complete shroud of secrecy (often formalised through confidentiality provisions in contracts), an astonishing absence of collaboration and a distinct lack of published information about the technical aspects of the disparate projects. A second and related trend concerns the increasing involvement of the pharmaceutical industry and private sector in sponsoring and initiating cultivation projects, a development that reflects the vested interests of the industry to secure long-term supplies of the drug and to ensure a high quality product. With a few notable exceptions this is associated with the virtual exclusion of local research institutions from participation in the technical work required and negligible involvement of rural communities in the establishment and ongoing maintenance of projects. Instead, most cultivation initiatives to date draw upon foreign scientists and are located on the lands of commercial white

> farmers in South Africa or Namibia. In all likelihood these patterns do not reflect any technical constraints associated with the difficulties of cultivation, but rather a preference on the part of industry to follow paths of greatest ease.' (Chapter 4)

The HIV/AIDS pandemic has had an enormous impact on the workforce. This is particularly the case in southern Africa where the highest global instance of infection exists; one in five adults is HIV positive and 4.2 million new cases are reported per year. While the instance of infection is decreasing in some countries, such as Uganda, there is a notable increase in others, such as Kenya (Kiai *et al.* 2002). While health issues were not discussed in great detail in our Case Comparison studies, the great loss of life in Africa has had a strong effect on land tenure and reform issues. This is particularly relevant to land transfer problems facing survivors, especially orphans and single mothers struggling for supplemental income generation for survival.

Gender issues

The gender differentiation surrounding NTFPs in Africa is particularly interesting and the case studies presented in this book highlight the increasingly important role of forest products in rural livelihoods, particularly for women. Although some industries are entirely male dominated, for example woodcarving (Chapters 9, 10, 11 and 12), rattan furniture production (Chapters 15, 16 and 17), bark harvesting of *Prunus africana* (Chapter 3) and sport hunting of elephant (Chapter 18), women play a dominant role in the marketing and final sale of many products. For example, 85% of the chewstick trade in Ghana is coordinated by women who organise themselves in a hierarchical trading system (Chapter 2). This level of organisation among female traders of forest products and foodstuffs, often led by market 'Queens', is a common occurrence in the large urban markets of Ghana (Clark 1994). The harvest and sale of fruits and nuts also seems to be a predominantly female economic activity as indicated by the studies of *Garcinia kola* (Chapter 7), *Dacryodes edulis* (Chapter 8) and shea (*Vitellaria paradoxa*), with the trade of this latter product being controlled exclusively by women (Chapter 6). The elderly population is also very much involved with shea, which is seen as a relatively 'simple' activity for them to manage.

Likewise, the local collection and sale of fuelwood in Cameroon is also dominated by women, often assisted by adolescent children (Chapter 13). Interestingly in the last case presented, the involvement of men in fuelwood collection has been to the detriment of the resource; women are more involved with collecting fallen branches and otherwise naturally dry material, whereas the involvement of male harvesters has precipitated significant felling of individual trees which are left to dry before being split and traded. Another male–female dichotomy is also described in the case of umemezi (*Cassipourea flanaganii*) where, although over 80% of the harvest and trade is undertaken by women, the few male traders are those that are willing to travel further to sell the bark and hence accrue the greatest revenues from the trade (Chapter 5).

Equity issues

Issues of NTFP commercialisation undoubtedly underpin issues of equitable distribution of benefits (Neumann and Hirsch 2000). Browder (1992) draws on available research from the Amazon and suggests that collecting NTFPs does not necessarily greatly benefit rural livelihoods and that the living standards of households that rely on forest products compare poorly with even the meager socio-economic norms of the rural Amazon. Southgate *et al*. (1996) suggest that, even for highly commercialized products, the greatest share of the profits is normally realised at the processing level, that is, at the top of the domestic marketing trade. This is a view also shared by Dove (1993: 18), who suggests that 'The more successful the [resource] development, the more likely it is that external political and economic forces will become involved, and the less likely it is that local people will be able to retain control.'

In this same vein, a number of the case studies presented in this book exhibit clear and characteristic issues of inequity in the distribution of benefits, particularly for rural harvesters. Most notably, these instances often occur with high-value products that undergo moderate to high levels of transformation and are sold in international markets. The tangible lack of benefits for most NTFP producers seems particularly to affect those involved in the sector as a coping strategy, as discussed above. In contrast, households involved in NTFPs as a specialized strategy attain the greatest level of benefits as they are often involved in both the production and transformation aspects of the system.

Another issue regarding equity is benefit sharing, which is specified in the Convention on Biological Diversity (CBD Article 1) as 'the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding' (Glowka *et al*. 1994: 15).

This is particularly relevant to medicinal plants for pharmaceutical research and drug discovery and incorporates technology transfer as a component to supply benefits back to local people who supply extractable resources. This issue is particularly relevant for devil's claw (*Harpagophytum* spp.), a traditional medicinal plant that now forms the basis of a US$100 million per year industry in which the benefits accrue almost entirely to the processing and transformation actors along the marketing chain while a very low proportion of the international trade value benefits the domestic producers. Since the commercialisation of the product resulted from ethnobotanical studies, it represents a classic example of 'biopiracy'.

Cultural issues

NTFPs are valued not only for their market value; cultural, social and spiritual attributes also add to the value of the products. Though not easily quantified, these characteristics may in some cases be as important to people as the economic value (Davidson-Hunt *et al*. 2001), an issue that is often overlooked. This is particularly germane to the case comparison studies where the products have been traded for decades. For example, one researcher noted under 'study limitations' the way to 'meet a chief is to introduce yourself with a gift of at

least 10 cola nuts. These procedures were followed so as to gain the villager's cooperation and to be seen as showing respect'. This ended up facilitating discussions with the villagers as to the kind of research being conducted (Gakou and Force no date).

The case study of devil's claw (*Harpagophytum* spp.) in Namibia (Chapter 4) describes how the harvesting methodology of these medicinal roots has contributed to Africa's long 'story' of persecution of ethnic groups, particularly the Omakeke San, the primary harvesters. Even though it is pointed out that there are no anthropological studies in relation to the trade of devil's claw, groups such as the Omakeke San have a complex history tied closely to the sociopolitical structure in Namibia. Postindependence resettlement placed them on government-owned farms with other ethnic groups in an area that is one of the most arid and marginal for agricultural production. Facing limited options for work, the Omakeke San are not unlike the people of neighbouring countries where extreme poverty and lack of education define the harvesting of devil's claw as a 'low status' activity. A similar situation exists for chewing sticks in Ghana, where harvesting is labeled a 'menial' activity (Chapter 2).

Further discussed in Chapter 14 is the link between cultural practice and commercialisation: cultural tradition controls the Sengwe (*Hyphaene petersiana*) harvesting in Zimbabwe, which begins with a 'kraal head has its own designated tapping fields and so the leaf harvesting areas. The chiefs, working through headmen, have overall control of palm utilisation. To date they have managed to stop the transportation and sale of unprocessed palm leaves. So far, the impact of traditional rules has been generally positive as it has resulted in the palm being conserved whilst everyone in the designated area has access to the palm for leaf harvesting'.

MARKET AND TRADE ISSUES

Trade perspective and history

The chapters of this volume show the importance of NTFP markets and their role in improving the livelihoods of farmers and traders involved in commercialisation of these products. Like other agricultural commodities, NTFP markets follow the law of supply and demand. The supply of NTFPs is a function of the amount of product harvested as well as the quantity stored. because of the seasonal nature of NTFP production, storage becomes important to insure availability throughout the year. The demand for NTFPs is a function of the quantities buyers are willing and able to purchase, which depends on the amount of capital they have at their disposal and the signal of scarcity in local, national, regional and international markets (Ndoye *et al*. 1997).

One feature that NTFP markets in Africa have is that they are thin, meaning that a small change in production (supply) has a large effect on the quantity marketed (Ndoye *et al*. 1999). This changes the role of the markets in assembling and distributing forest products from year to year. For example, the past five years have statistically shown a three- to sixfold increase in the amount of devil's claw (*Harpagophytum* sp.*)* traded (Chapter 4). While local trade of this product is centuries old, the international trade history dates

back just 50 years when Western pharmaceutical companies took interest in the product for medicinal research and pharmaceutical profit.

Local markets for NTFPs. Local markets contribute to the well-being of rural households by enabling farmers to sell their forest products. In these markets, the process of price setting between harvester (farmer or seller) and trader (buyer) involves bargaining (haggling) to reach an equilibrium price somewhere between the lowest price the seller is willing to accept and the highest price the buyer is willing to pay (Ndoye *et al*. 1997). Haggling is common in African markets and is highlighted in Chapters 9, 12 and 15. Accessibility of and proximity to the markets are important variables that affect farmers' willingness to market their forest products (Chapters 8 and 12). Local markets are affected by many inefficiencies caused by regulatory enforcement officials (police, gendarmerie, forestry officials, municipal authorities), which increase transaction costs. This is particularly the case for rattan (Chapters 14, 15, 16 and 17). One immediate consequence of such practices is the increase of the level of extraction or harvest to meet these costs. Woodcarvers in South Africa face particular difficulties when dealing with regional trade for crafts as opposed to more locally consumed furniture (Chapters 9, 10, 11 and 12).

Adding value. Because there are many players involved in adding value from harvest to market, trade data is often fragmented and unavailable for the entire process as monitoring and seasonality are inconsistent. In the case study of woodcarvings from *Pterocarpus angolensis*, Shackleton and Shackleton conclude that specialized market studies are needed to further the understanding of this century-old trade (Chapter 12). Urban markets involve migration and people who bring their rural cultural preferences and uses of NTFPs with them.

What is often overlooked in the value chain is the role of intermediaries: (1) intermediary traders who buy from primary producers and sell to larger volume traders, processors, exporters or retailers; (2) export processing services, which facilitate links between producers and commercial buyers and (3) intermediary marketing organisations, which identify market linkages between producers and appropriate buyers and are paid a commission for each deal facilitated (Belcher and Schreckenberg unpublished draft).

Postharvesting handling of NTFPs is vital to product marketability. Consistent storage and transportation, however, are unpredictable in Africa where infrastructure continues to be weak in most areas. This issue could be particularly detrimental in relation to medical plants, which on the open market demand a high level of quality control. Another related issue is scale-up. With demand fluctuating and issues such as fad or niche markets in the U.S. and elsewhere, technical issues such as product scale-up are difficult to judge. This is significant for large internationally marketed products such as shea which is processed in a variety of ways (Chapter 6).

Regional and international markets. Many authors have highlighted the importance of international trade in NTFPs in West and Central Africa, both between neighbouring countries and with countries outside Africa (Falconer 1990; Tabuna 1999). Several reasons explain this importance.

(a) Eco-physiological: The production of some NTFPs is highly seasonal. For example, *Dacryodes edulis* production is from June to November in countries like Cameroon and Nigeria and from November to April in Angola, Congo, Democratic Republic of Congo and Gabon. This seasonal variation through the region stimulates trade among countries.
(b) Linguistic and cultural: It is common to find close ethnic groups living on both sides of a given frontier, consuming similar products and with significant trade among them (Ruiz-Pérez *et al*. 2000).
(c) Migration patterns: Many countries in Europe and North America have important communities of migrants from Africa. For example, NTFPs such as *Dacryodes edulis*, *Gnetum* spp., *Ricinodendron heudelotii* and *Irvingia* spp. are found in shops specializing in tropical products in Brussels, Lisbon, London and Paris (Tabuna 1999).
(d) Trade value and volume: The majority of NTFPs treated in this volume (65%) are traded in international markets. The value of trade is medium (US$1 million to US$10 million per year) for 41% of the cases. Only one NTFP, *Bachylaena huillensis,* used in woodcarving in Kenya, has a high value of trade (more than US$10 million per year). Shea butter is intricately linked to other large-scale NTFP exports such as cocoa and cashews. As pricing fluctuates for one market, the other follows suit or acts as a substitute. However, export figures vary from company, government and agency (FAO) statistics—for shea from 7,870 tonnes to 13,000 tonnes of kernels in just one year (Chapter 6).

Trade Organisation and Development

Fair trade. 'Fair Trade' organisations promote 'eco-harvested' products with an emphasis on rainforest products (Shanley *et al*. 2002). Fair trade organisations work with producer co-operatives that use democratic principles to ensure that working conditions are safe and dignified and that producers have a say in how their products are created and sold. Co-operatives are encouraged to provide benefits such as health care, child care and access to loans. They encourage producers to reinvest their profits into their communities (www.fairtrade.org).

Fair trade initiatives are hindered, however, by a number of social and institutional constraints. At the local level, these include a lack of tenure security, insufficient monitoring capacity, poor business and management skills and low levels of organisation. Inadequate quality and resource management also present major hurdles. At the international level, monopoly control severely compromises the ability of local producers and range states to receive optimum benefits and prevents range states from adding full value to their resources. Cultivation efforts represent a further threat to ensuring a reliable stream of benefits for harvesting communities.

Some fair trade organisations work to shift processing and packaging activities to the developing world, so that as much work as possible will remain in the producer country. Often, such activities are performed abroad, depriving

the neediest countries of the opportunity to boost their incomes. With concepts such as these being adopted into practice in an equitable manner, solutions are possible (www.fairtrade.org). Again, Dove (1993) points out the need to recognise that this is not often the case where plantation and NTFP enterprise 'owners' are the most likely to gain. Likewise on the consumer side: 'The responsible consumer is only slightly more enlightened; they are willing to make their contribution, but they are naive about the many complex issues' (Wilkins 1999).

The Fair Trade Federation 2003 report (www.fairtrade.org) details a 37% increase in North America and the Pacific Rim for fair trade products. Sales reached US$250 million. However, most trade continues to be skewed to international trade agreements, such as the North American Free Trade Agreement and the General Agreement on Tariffs and Trade, which reduce barriers to trade and investment for firms. As a result, the gap between producers (the poor) and investors (the rich in the 'north') continues to widen. In addition, it must be remembered that consumers are often more interested in protecting ecosystems, not necessarily the people who live in them (Clay 1993). Therefore, it is up to in-country managers to promote fair trade issues and justify the reason behind the subsequent increase in price.

Impact of commercialisation. The income obtained from the sale of NTFPs enables farmers to meet their basic needs and those of their families (purchase of medicinal products, kerosene, soap and clothes; construction of houses; payment of dowry and school fees) (Chapters 3, 12, 13 and 17). The income farmers get from selling NTFPs enables them to finance other lucrative activities such as purchase of pesticide for cocoa plantation (Chapter 17). Income received from the sale of NTFPs can also help rural communities invest in water and electrification projects. This is particularly so in the case of *Prunus africana* in Cameroon (Chapter 3).

Training producers to commercialise their products, as in the case of the Sengwe palm in South Africa, is assisting them by researching the sales opportunities in distant markets. In addition, training is provided to analyse and capitalise on market trends. Yet again, without a sustainable supply and equitable benefit sharing of Sengwe or the many other NTFPs analysed here and elsewhere, the marketability declines (Chapter 14). In order to improve the market position of NTFPs, one must analyse the commodity 'value chain' in much greater detail. Several strategies can be used to increase returns, such as vertical integration (e.g. packaging), improved quality and efficiency, horizontal integration (e.g. co-operation with other small enterprises) and targeted marketing (Belcher 1998).

POLICY AND DEVELOPMENT

The global Case Comparison project provides useful examples of success stories, and failures, in relation to NTFPs. There are many government agencies working closely with non-governmental agencies such as CIFOR in organising a vision for NTFPs. Because of variability in NTFPs from wild harvested species such as devil's claw (Chapter 4) to field and fallow parkland harvested species such as shea butter (Chapter 6), it is difficult to assess where government policies can

assist local producers in the form of organisation, sustainable harvesting strategies and forestry reserves support. Clearly, a synergy must exist for a product to move from harvesting into the commercial sector and continue to provide a sustainable yield, economic benefits, and a low ecological impact. But is lumping NTFPs into the forestry sector, in itself, adequate protection?

An example of a foreign ministry working well with other governmental agencies is an extensive study underway in Zimbabwe for which CIFOR has teamed up with the U.S. Agency for International Development's CAMPFIRE programme to study the impacts of the wood carving industry. A potential answer to its success is likely the incorporation of local people in the decision process recognising the potential negative impact on the forest as a resource for production of wood carvings (www.cifor.cigiar.org). The Shackleton and Shackleton study on woodcarving observed that organisation of local producers was a key constraint in the analysis (Chapter 12). Poor business and organisational skills could be issues taken up by government agencies such as the trade ministry. However, with expertise drawn from other institutions, such as CAMPFIRE, alternative strategies can prove useful to both industry and local people.

THE WAY FORWARD

NTFP case analyses such as those presented here continue to facilitate a sound understanding of NTFP markets and their potential to further enhance livelihood strategies of people in Africa. At the same time, scientists, politicians, non-governmental organisations and research institutions race to study the various components of domestication of wild species of NTFPs as a possible solution to sustainability. The third, and perhaps most critical, component is the fact that ease of penetrating distant markets with NTFPs while still sustaining local use markets is a delicate balance. The international marketing of biodiversity products brings together at least two starkly different cultures and economies. To succeed, projects must be carefully designed to accommodate the distinct needs of these disparate worlds, and good communication among all parties is a must.

In the case of devil's claw, recent regulations such as permitting created strict harvesting periods for an NTFP traditionally being harvested year-round in an arid region where livelihood options are limited. Because it is now endangered, international support for harvesting monitoring is enforced by the Convention on the International Trade in Endangered Species of Flora and Fauna on an international level. But does this adequately assess the local consumption of devil's claw? The financial benefits to the harvesters rarely exceed 0.85% of the retail price. Surely a more equitable policy structure is the key to long-term sustainability, on both an economic and an ecological level for this high-in-demand medicinal plant. How can we continue to develop a link between foresters, scientists and government agencies and economists, social workers, village leaders and the artisans and producers of NTFPs?

According to Dove (1993) the 'widely accepted explanation of tropical deforestation attributes it to the poverty of its native inhabitants'. His contrary view is that the poverty of forest dwellers is an outcome of the exploitation of

forest resources by powerful outsiders. One aspect of this argument is the suggestion that NTFPs are unlikely to be a solution to poverty, as any product that is valuable and for which commercial exploitation is viable, will be taken over by such outsiders. While this theory has been disputed in terms of having universal or even wide applicability, it does have plausibility and, if true, really calls into question the whole notion of conscious attempts to alleviate poverty through forest enterprises (Southgate *et al*. 1996).

The lessons learned from the case studies are as variable as the products themselves, but there is a resounding complaint of lack of organisation among workers and lack of access to administrative assistance such as credit organisations. In addition, a main conclusion was the need for further studies, whether to assess the urban markets in more detail or to look deeper in the pricing of NTFPs at a subsistence level.

What we can learn from case comparison studies such as these is a cohesive strategy which (1) includes structured policy to promote NTFPs, (2) promotes knowledge of and safe and sustainable access to resources, (3) responds to needs for legislation and regulations and assesses and improves technologies, (4) organises producers, (5) builds capacity and promotes human resources, (6) continues research into domestication, (7) supports technical and marketing strategies and (8) looks to trade history of existing NTFPs and assess market potential prior to introduction of new NTFPs.

Monitoring international trade of NTFPs can be impeded by lack of demand, inconsistency of data from local processing facilities through the market chain and sustainable supply. In turn, these factors are linked to lack of investment. Private capital lacks the will and interest, while state capital lacks the focus, planning and knowledge. A potential role for researchers to help maintain interest in NTFPs by investors and consumers will depend on modernisation of NTFP production. For woodcarvers in Africa, this is a particularly crucial step as they face moving from local sales to tourists into the wholesale market (Chapters 9, 10, 11 and 12).

NTFP commercialisation should start with products already on the market. Introducing new products can take up to five years for foods, 10 for personal-care products and 20 for pharmaceuticals (Clay 1992). All case studies included here are already considered to be infiltrated into trade. The key now is to learn from case comparisons, such as those presented here, as to how NTFPs in Africa can remain a sustainable industry and actually increase the economic position of the local people while also tackling modernisation.

CONCLUSION

For products such as shea, a commodity heavily within the local and international trade, the options for market sustainability and growth are interdependent on other traded commodities such as cocoa and cashews (Chapter 6). On the other hand, to achieve a fair and sustainable trade base for medicinal plants, such as for devil's claw (Chapter 4), there is a strong need to recognise market constraints of this single product, such as lack of tenure security, poor monitoring, a dwindling resource base and lack of business skills. The differences between these two studies and the remaining 15 are

inherent to NTFPs—they vary widely in material composition (from wood to elephants), use (medicinals to drumming) and market potential.

The following case studies, spanning 17 NTFPs, reveal an ancient system of resources moving through space and time, resources which further enable African people to benefit from their marketing capacity locally. As our case studies show, establishing or strengthening markets for NTFPs can help to encourage renewable resource conservation and can contribute significantly to rural livelihoods. However, for NTFP extraction to 'save' large tracts of forests and woodlands, the problem of attenuated land and property rights will have to be resolved, just as it must be resolved if eco-tourism, selective logging or any other economic activity is to be conducted in an environmentally sound manner. In addition, attempts to raise the market value of NTFPs, and therefore rural incomes, could be self-defeating if agricultural production of these products originally harvested from the wild is the result. In addition, understanding the political economy is crucial in addressing the economic, social and institutional contexts in which NTFPs are harvested and traded.

ENDNOTES

1. However, land conversion to agriculture in Benin is affecting the regeneration of *Vitellaria paradoxa* (Chapter 6).

2. But Philips (1993) suggests that fruit production from tropical forest is far less than most conservationists assume.

3. Fortunately, the commercial species of rattan favoured by artisans are geographically widespread throughout the lowland forest regions of Africa (Sunderland 2001).

4. Domesticated in the sense that the desirable traits of the species have been selected over generations so that the cultivated resource is genetically different from its wild relative. Often such species are only able to be reproduced clonally, of through the use of first generation (or F1) seeds.

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