

Chapter 3

From Subsistence to Safety Nets and Cash Income: Exploring the Diverse Values of Non-timber Forest Products for Livelihoods and Poverty Alleviation

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Abstract Millions of rural and urban dwellers across the world make use of a wide diversity of forest products to fulfill several livelihood requirements, from direct household provisioning to cash income, cultural needs, and as a fall back in times of emergency or a means to income diversification. All these roles are significant, and often NTFPs perform multiple functions simultaneously. Valuing NTFPs therefore requires a holistic perspective that considers these products in relation to multiple livelihood strategies, and within particular contextual settings. The context within which people operate has major implications for the perceived importance and value of NTFPs. Chapter 3 deals with these issues, drawing on data from several countries to illustrate the benefits NTFPs bring to different types of households and how such forest products perform an important function in reducing vulnerability and ameliorating poverty.

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3.1 Introduction

Forest-dwellers across the globe have a long history of dependence on a wide array of forest products for household sustenance and sale, with some 1.4–1.6 billion people worldwide estimated to make use of at least some non-timber forest products (NTFPs) (FAO 2001, Table 3.1). These products are collected from natural forests, woodlands, and other lands (such as fallows, agro-forests, secondary forests and fields) surrounding dweller’s villages and homesteads, and may include wild foods, forage, medicinal plants, construction materials, fuelwood, raw materials for handicrafts (rattans, vines, bamboo, grasses, reeds, and other fibres), and other products such as resins and honey (Chap. 1; Figs. 3.1, 3.2, 3.3 and 3.4). While subsistence gathering for direct household provisioning tends to be the most widespread use of NTFPs (including in developed countries), forest products are also often sold, in raw or processed form, in informal local and regional markets. In other instances, NTFPs may form the basis of small-scale commercial enterprises, with some commodities reaching high-value international markets (Chap. 4).

Table 3.1 Estimates of number of forest users in different categories worldwide (Scherr et al. 2003)

Category of user	Estimated population of users
Forest dwellers who depend on natural forests for their livelihoods (hunting, gathering, shifting cultivation)	60 million
Rural people who live in or at the margin of forests and who rely on these as a safety net or for supplemental income	350 million
Small-holder farmers who grow farm trees or manage remnant forests for subsistence and income	0.5–1.0 billion
Artisans or employees in formal or informal forest-based enterprises (often urban based)	45 million
Estimated total	1.0–1.4 billion



Fig. 3.1 Rural collectors bringing their harvest of *Sclerocarya birrea* fruits (marula) to sell at the central depot for Amarula Cream liqueur, Limpopo Province, South Africa (photo: Myles Mander)

Fig. 3.2 Hand brooms made from *Athrixia phyllicoides* for sale in a rural month end traveling market, Bushbuckridge, South Africa (photo: Sheona Shackleton)



Fig. 3.3 Animal woodcarving from local softwood sold along tourist routes outside Kruger National Park, South Africa (photo: Sheona Shackleton)



Fig. 3.4 A teenage girl selling marula beer (made from *Sclerocarya birrea* fruits) at the roadside to passersby, Bushbuckridge, South Africa (photo: Sheona Shackleton)



The value of these NTFP-based activities to households is significant, and they undoubtedly contribute appreciably to the livelihood security and welfare of primarily poor, rural people (Bryon and Arnold 1999). For example, recent work to place an economic value on both the auto-consumption (subsistence or in-kind use) and sale of NTFPs at household level has shown this to be worth several hundreds of dollars per annum per household (Vedeld et al. 2004, Table 3.2). Moreover, the income share (percentage contribution to total income) of these products can be as much as one third to one half of total household income, with an average contribution of about one fifth (Paumgarten and Shackleton 2009). In many regions, the largest proportion of this value can be attributed to fuelwood consumption, followed by wild foods and construction materials and medicines (Vedeld et al. 2004; Paumgarten and Shackleton 2009; Babulo et al. 2009). Disaggregation of these findings by household wealth status suggests that NTFPs are most significant for poorer households, although this does not mean they are not used and appreciated by wealthier groups (Shackleton and Shackleton 2006; Rueff et al. 2009; Paumgarten and Shackleton 2009). Cavendish (2000), for instance, working in the savannas of

Table 3.2 Value of NTFPs to rural households derived from several studies

Region/country	Value (USD per household per year) ^a	Percentage contribution to total household income	Source
South Africa, Mogano, Limpopo Province	1,130	–	Shackleton et al. (2002b)
South Africa, Mametja, Limpopo Province	620	–	Twine et al. (2003)
Zimbabwe	578	–	Campbell et al. (1997)
South Africa, Bushbuckridge, Limpopo Province	572	19.4	Dovie (2004)
South Africa, Ha-Gondo, Limpopo Province	565	–	Shackleton et al. (2002b)
South Africa, Kwajobe, KwaZulu-Natal	469	–	Shackleton et al. (2002b)
Zimbabwe	436	28.4	Cavendish (2000)
Eritrea, Dighe, Gash-Barka Administrative Zone	386	–	Araia (2005)
Botswana	335	20.1	Zitzmann (2000) in Chipeta and Kowero (2004)
Zimbabwe	320	–	FAO (1999)
Thailand	288 ^b	–	Delang (2006)
South Africa, Kat River, E. Cape	241	–	Shackleton et al. (2002a)
South Africa, Fish River, E. Cape	160	–	Cocks and Wiersum (2003)
Zimbabwe, Chivi	99	15.0	Campbell et al. (2002)

^aValues are not directly comparable as different studies have varying criteria regarding what to include/exclude from the analysis. Local currencies have been converted to USD at the exchange rate for the year fieldwork was completed

^bDirect household consumption only

Zimbabwe found that “environmental income” (including forage for livestock production) formed some 40% of total income for the poorest households, relative to 29% for more well-off households. On the other hand, Ambrose-Oji’s (2003) work in Cameroon suggests that it is the middle income groups who benefit most from the use and sale of NTFPs. It is these initial studies that prompted the Center for International Forestry Research (CIFOR) to initiate the PEN (Poverty and Environment Network) study in which some 40 PhD students worldwide set-out to estimate the contribution of forest income to household income streams by using a standardised survey instrument. Preliminary results demonstrate similar ranges of income share to those in Table 3.2 (<http://www.pen.cifor.org>).

While clearly there is a strong rural dependence on forests and their products, some NTFPs (such as fuelwood, charcoal, bushmeat, medicinal plants, construction timber, traditional brooms) are also in demand in towns (Chap. 6), either because rural dwellers have migrated and still want to consume traditional forest products, or because town dwellers believe that these products are better or cheaper than mass manufactured alternatives. Urban households thus benefit from the availability of a more affordable source of essential goods, as well as access to products of traditional significance (Chap. 5). Furthermore, many poor urban men and women are artisans, processors, and end traders of high demand NTFPs such as medicinal plants, indigenous foods, charcoal, building materials, furniture, and crafts (Stoian 2005; Shackleton et al. 2007b; Fig. 3.4).

Estimates of the global demand for NTFPs and the significance of these products in securing different aspects of household livelihoods are revealing. Table 3.1 illustrates numbers of NTFP users, according to the use and importance of NTFPs for their livelihoods and survival. For about 60 million people, NTFPs are essential, while a further 350 million use NTFPs in times of crisis, such as a harvest failure or ill health that prevents them from working on farms. Between five hundred million and one billion people manage remnant forests for subsistence or sale of NTFPs, and a further 45 million people are artisans or employees transforming NTFPs into marketable products, often in urban centers.

Against this background of dependency on forest products and opportunities for trade and cash income, this chapter explores the role that forest and other ecosystem products play in reducing vulnerability, securing livelihoods, and increasing incomes among NTFP users. In particular, we aim to answer the following questions: (a) Under what circumstances are the consumption and trade of NTFPs a rational economic choice, and when is it an activity that people engage in because of lack of alternatives? (b) Who benefits most from NTFP use and sale? (c) How do NTFPs assist in securing livelihoods and reducing vulnerability? and (d) How do NTFPs contribute to poverty alleviation and help poor people accumulate assets and move out of poverty? We do this in three sections. The first section describes the role of NTFPs in the subsistence of rural communities, including their importance in meeting basic needs and saving household expenditure. The second examines why households turn to trading in NTFPs, while the third section describes the role that the consumption and trade of NTFPs has in poverty alleviation. We illustrate how NTFPs are decisive in providing poor people with a means to

cope with crises and how they can help build household and community resilience. We also discuss where and how NTFPs can contribute to small enterprise development, providing a “stepping stone” (Marshall et al. 2006) for people to escape poverty.

3.2 Household Subsistence Use: NTFPs in Meeting Everyday Needs

3.2.1 NTFPs in Household Provisioning

The collection of NTFPs for subsistence use is prevalent in rural communities across the world (Table 3.3 provides figures from South Africa). This dependence can partly be traced back to geographic constraints. Many NTFP users live, almost by definition, far from market towns. This distance, compounded by poor road networks, makes transport costly, hindering participation in the market economy, with the result that households may have little cash at their disposal and limited opportunity to purchase their daily necessities. In such situations, forests provide essentials that others buy in markets. Wild foods are effectively free (other than the opportunity costs of labour), and if a forest dweller had to choose between gathering food from the forest or spending more time and limited cash resources going to town to purchase commercially grown alternatives, it is rational to choose the first option. Medicinal plants offer free self-medication, while rattan, bamboo, wood, vines, and grasses are free raw materials from which people can make baskets, mats, fences, roofs, walls and agricultural implements, and wood provides a free or cheap energy source. Such daily subsistence use of NTFPs allows households to save their meager cash resources for goods and services that cannot be obtained locally (Shackleton and Shackleton 2004). As a result, although the collection of NTFPs for household use is an activity that is generally available to all households, and in which a majority engage, it is likely to be more important for and more

Table 3.3 Prevalence of use (mean \pm SE) of NTFPs from South African savannas ($n = 14$ villages; 30–60 households per village) (Shackleton and Shackleton 2004)

NTFP	Percentage of users	NTFP	Percentage of users
Wild spinaches	95.6 \pm 1.3	Bushmeat	51.6 \pm 8.4
Fuelwood	95.5 \pm 1.9	Wild honey	50.5 \pm 10.6
Wooden utensils	95.1 \pm 1.9	Medicinal plants	49.4 \pm 7.5
Grass brushes	90.7 \pm 4.6	Wood for housing poles	49.0 \pm 8.1
Wild fruits	88.2 \pm 4.0	Thatch grass	48.8 \pm 9.0
Twig brushes	87.1 \pm 5.1	Wild mushrooms	25.2 \pm 9.2
Wood for fencing	62.0 \pm 5.5	Reeds for construction	14.6 \pm 6.5
Weaving materials	55.4 \pm 9.6	Wood for furniture	6.7 \pm 1.7
Edible insects	53.5 \pm 9.5	Seeds for decorations	3.2 \pm 1.8

widely exploited by poorer groups with limited land and other assets, minimal education and skills, and few other income sources (Cavendish 2000; Paumgarten and Shackleton 2009).

In terms of subsistence use, NTFPs are critical for health, nutrition, shelter, and energy. While the most important NTFPs for rural communities may vary and are often context specific, some products that traditionally played a key role have become less important and others have remained central. Among the former are NTFPs that have been replaced by more “modern” and “efficient” goods (plastic household utensils, furniture), and among the latter are those that are not easily replaceable, or only at high cost (fuelwood, wild food plants, fencing and construction material).

3.2.2 NTFPs for Energy

Fuelwood and charcoal are used by the majority of rural, and in some cases urban, households across the developing world (e.g., Babulo et al. 2009). For example, in South Africa (one of the more developed African nations) over 80% of rural households still use fuelwood to some extent (Williams and Shackleton 2002). Nearly all of this, some 10 million tons annually, is supplied from indigenous forests and savannas and has a gross national value of approximately USD 0.40 billion (R3 billion) annually, or just under USD 182 (R2,000) per using household per year (some 23% of the minimum wage). In Nepal, Shrestha (1998) showed that over 13 million tons of fuelwood is consumed annually, with the residential sector accounting for over 91% of use. It has been estimated that more than 2.4 billion people in Nepal rely directly on traditional biomass fuels for their cooking and heating (IEA 2002). The use of fuelwood has been implicated in deforestation, especially in arid areas (Heltberg et al. 2000) and at high altitudes, such as Nepal (Stevens 2003), but also in tropical countries such as Vietnam (Linde-Rahr 2003). However, the picture is seldom simple, and this conclusion has been challenged conceptually and practically in many situations (Benjaminsen 1997; Nagothu 2001; Box 2.1, Chap. 2). A shortage of fuelwood can result in changed cooking patterns with potentially ill effects on household nutrition and health (Brouwer et al. 1997) (Table 3.4).

Table 3.4 FAO projection of fuelwood consumption (in million cubic meters) to 2030 in developing regions (Arnold and Persson 2003)

Year	1970	1980	1990	2000	2010	2020	2030
South Asia	234.5	286.6	336.4	359.9	372.5	361.5	338.6
South East Asia	294.6	263.1	221.7	178.0	139.1	107.5	81.3
East Asia	293.4	311.4	282.5	224.3	186.3	155.4	127.1
Africa	261.1	305.1	364.6	440.0	485.7	526.0	544.8
South America	88.6	92.0	96.4	100.2	107.1	114.9	122.0

3.2.3 NTFPs for Food

Forest and woodlands offer rural dwellers a wide variety of foods, and contribute to food security and nutrition directly and indirectly by providing fruits, seeds, leaves, bulbs, mushrooms, honey, beverages (Fig. 3.4), bushmeat and fish, forage for domestic animals, and tools and equipment needed for farming, hunting, and fishing. This food security dimension of forests is important; for example in the Gash-Barka administrative zone of Eritrea, local people rated the provision of wild foods as the most important ecosystem service provided by riverine forests (Araia 2005). Wild foods are commonly eaten because they are nutritious and rich in vitamins and supplement cultivated staples (Grosskinsky 2000), and because isolation from markets precludes people from buying food. Delang (2006) has shown that a group of forest dwellers in Thailand would need ten times more time to work for cash and buy food in the market than they need to gather “similar” food in the forest.

The diversity of wild foods used can be considerable. For example, forest-based shifting cultivators in Laos obtain a range of species from fallow areas, which change as the fallow ages (Delang 2007). An 11-year old fallow offers cultivators 126 different usable plant taxa, of which 55 are food plants and 12 animal feed. In comparison a 1-year old fallow provides 33 taxa, of which 16 are used for food, while a 3-year old fallow offers 13 taxa, of which seven are used for food. Plans by the government to reduce the period of fallow to 3 years will thus have negative consequences on people’s nutrition, as the number of edible plants available in the fallows would decline.

While wild foods are commonly a regular part of the diet, their consumption may be extended to additional species or become more frequent during droughts, floods, or other lean times, or they may substitute for purchased products during cash flow crises (Kaimowitz 2003). In the dry forest regions wild foods are important in supplementing people’s diets, and may assume greater significance in the dry season or dry years when they substitute for failed crops (Addis et al. 2005). The so-called “famine foods” of the Sahel region are wild foods obtained from drought resistant dry forest species that may only be consumed in years of severe drought, but are vital for food security during these times (Guinand and Lemessa 2001; Chap. 2). In this way these NTFPs help insure against food insecurity; something that may assume magnified significance under the threats of climate change.

Wild foods are often consumed most frequently by women and children, although this does not necessary apply in all countries (Box 3.1, Table 3.5). Wild food resources also tend to be most important for vulnerable households. For example, data from South Africa show that 62% of 850 children surveyed were supplementing their diets with wild foods; and for 30% over half their diet was formed by these resources (McGarry and Shackleton 2009a). Furthermore, highly vulnerable children (i.e., those in households with high HIV/AIDS proxies) were found to consume more forest foods in their diet than those from less vulnerable households, with hunting of small animals providing an essential source of protein (McGarry and Shackleton 2009b, Table 3.5). Similarly, Hunter et al. (2007) found

Box 3.1 Gender, Wild Foods, and Food Security: An Example of the Hazda in Tanzania

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A study by Murray et al. (2001) on the diets of the Hazda in Tanzania showed that Hazda men eat more meat and honey than women, while women depend more on plant foods, in particular baobab seeds. From a cultural perspective, men have the “better deal”: meat and honey are high status foods. But, from a nutritional perspective, men and women’s diets are of similar value: baobab seeds are a good source of protein, fat, and energy, equivalent to that of honey. Furthermore, from an access and seasonality perspective, women’s diets are favoured. Although baobab seeds and fruit are not the dominant wild foods eaten by Hazda women, they can be consistently collected throughout the year from a variety of locations. These range from the baobab trees themselves, to foraging for discarded seeds in baboon dung piles during nonproductive periods. When these factors were weighed-up, the authors concluded that the baobab provides the most important and nutritionally reliable food in women’s diets.

Table 3.5 Frequency (total count of animals) of wild animals in high vulnerability (HV) and low vulnerability (LV) children’s diets over a 2-week period, as well as the percentage of children hunting each taxonomic group at Coffee Bay and Mabehana, South Africa

Taxa	Frequency of wild protein in the diet			Percentage of children hunting		
	LV (<i>n</i> = 24)	HV (<i>n</i> = 25)	<i>p</i>	LV (<i>n</i> = 24)	HV (<i>n</i> = 25)	<i>p</i>
Mammals	39	133	0.04*	33	60	0.06
Birds	89	195	0.02*	25	64	0.01*
Reptiles	8	13	0.33*	4.2	12	0.03*
Insects	3	13	0.05	4.2	24	0.05
Coastal resources	13	9	0.37	91	96	0.53

**p* < 0.05 (McGarry and Shackleton 2009a, b)

that households affected by a recent adult mortality (usually from AIDS) often turn to harvesting wild foods and other NTFPs to cope.

3.2.4 NTFPs for Medicine

Medicinal plants have been important in human healthcare throughout history, and continue to play a key role amongst forest communities. For rural populations, modern medicine and healthcare services are often difficult to access and

unaffordable, and thus beyond most people's reach (Maundu et al. 2005). Traditional medicines, on the other hand, are locally available and free or of low cost. For example, users in Chitwan (Nepal) save 80% of costs by using herbal treatments provided by the *Guraus* (local faith healers) rather than commercial alternatives bought in pharmacies (KC 2003). Although in some regions medicinal plants are gradually being replaced by commercial pharmaceuticals, use is still sizeable in many countries. For example, 90% of rural and 40% of urban Nigerians use medicinal plant products (Osemeobo and Ujor 1999). In Ethiopia, over 85% of the rural population, plus an increasing number of people in urban centers, use medicinal plants as their primary source of healthcare (Deffar 1998). Moreover, there is evidence to indicate that some plants used for cultural and ritual medicinal purposes are not substitutable and thus continue to be significant for all wealth groups in both rural and urban populations (Cunningham 1997; Cocks and Dold 2006).

3.2.5 *NTFPs in Construction and Craft*

In terms of construction material, NTFPs play an important, although in some areas declining, role in building and fencing. In tropical Southeast Asia and South Asia, bamboo is one of the main materials for construction (Pant 2007). Easily gathered and transported to the village, it can be used for the support poles, walls, or roof of a house and is the preferred material for the farmland hut, which is occupied for 5 months every year between rice sowing and harvesting. Bamboo is sometimes also used to build the first house for a newly married couple, before the necessary construction wood can be cut, accumulated, and brought from the forest (Pant 2007). Thatch grass as a construction material remains important in many areas, even though there is a trend toward alternative roofing materials (Hawkes 1992). Among some ethnic groups (e.g., the Xhosa in South Africa), cultural norms dictate that at least one dwelling in the homestead must be thatched (Timmermans 2004). Palm leaves are also used in house construction for both walls (plaited sheets) and roofing in Asia and Africa. In Eritrea, the average traditional house requires some ten "camel loads" of palm leaves a year for routine maintenance (Araia 2005).

Historically, natural fibres from forest plants provided the raw material for a wide range of utilitarian goods such as clothing, ropes, basketry, fishing nets, brooms, mats, and construction materials. Today, a number of alternative products have replaced functions typically provided by fibre products. For instance, bought fabrics have replaced home produced natural fabrics. Cheap or free plastic bags and plastic or metal storage bins now substitute for baskets (de Vletter 2001; Kgathi et al. 2005). Nylon ropes have replaced hand woven bark rope. However, fibre use still remains an option for those too poor to afford alternatives or in isolated communities. For example, communities living close to riverine forests in western Eritrea use 21 different household items made from dom palm, with the direct-use value of these being the highest of all NTFPs surveyed, at USD 80 per household per year (Araia 2005). Woven mats, ropes, and basketry products are now often

traded both within local and regional markets for cultural and traditional purposes and in nontraditional and tourist markets for their decorative and novelty value (Pereira et al. 2006, Box 3.2).

Box 3.2 Mat Weaving Empowers Women in Rural Villages of South-Central Bangladesh and Secures their Livelihoods

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Mat weaving using *Typha elephantina* (locally named *hogla*) has long been a traditional pastime of rural women in agrarian Bangladesh. In villages in the south central part of the country this practice has become a popular income generating activity, particularly for rural women who have not had adequate access to education or training. For decades the low lying and unsuitable agricultural land in the area has been used for the cultivation of *hogla* at minimal cost and effort. A survey conducted during 2007–2008 in the tri-weekly market place (locally called *hat*) of three neighbouring villages in Noakhali district revealed that women from about 256 families in the three villages were involved in *hogla* mat weaving.

These women spend their time between their regular household activities weaving *hogla* mats. On average, each woman sold ten standard sized (1.8 × 2.4 m) mats every week. Their average estimated income was Tk. 700 (USD 10) per week. The cost to purchase dried *hogla* leaves was Tk. 240 (USD 3.5), leaving a profit of Tk. 460 (USD 6.5) per week. This makes mat weaving the second most prominent source of family income after agriculture. Overall some Tk. 315,000 (USD 4,532) worth of *hogla* mats and Tk. 95,000 (USD 1,365) worth of raw *hogla* leaves were sold each week in the three surveyed markets. Although there is a permanent market and source of *hogla* leaves, the major trade in leaves takes place during September–November. The prices of both *hogla* leaves and mats falls by (up to 25%) during this period and women are required to weave more mats to maintain their returns. Some women also store and purchase adequate *hogla* leaves at a comparatively low price during this time for use during the rest of the year.

The entire production and supply chain of *hogla* mats is dominated by women – they weave mats, take them to nearby markets to sell them themselves or to male traders, and return home after purchasing the raw materials for further weaving work, along with other necessary goods for their family. Elderly family members and young school-going children (after school) also often provide assistance in this activity. For some elderly, widowed, divorced, and vulnerable women in the area, mat weaving is their only source of income. Generally women invest their earnings from this business in

(continued)

(a) supporting family nutrition, education, and health checkups for their children; (b) paying off regular installments for small loans; and (c) saving for use during emergencies and the agricultural off-farm period. In fact, these basic contributions have made some apparently simple and conservative women of the area important and active players in their families and communities. Their ability to earn independent income empowers them and provides them with the confidence to voice their opinions more loudly when taking family decisions.

Several recent studies have shown that the use of traditional brooms is extensive (Cocks and Dold 2004; Gyan and Shackleton 2005; Shackleton and Campbell 2007, Chap. 2). Twig brooms are used for sweeping outdoors, while grass or reed brooms are used to clean inside the house. In Bushbuckridge in northeast South Africa, all households and most schools and local businesses use these brooms, resulting in an annual turnover of some 360,000 brooms (Shackleton and Campbell 2007). Brooms are also of customary and spiritual significance and are given as wedding gifts in Xhosa culture. They are believed to help prevent lightning strikes and bring good luck (Cocks and Dold 2004). Brooms made from palm fibres or midribs are also common in many regions. In Dighe administrative subzone in Eritrea, the average household owns eight dom palm brooms (Araia 2005).

The above discussion leaves little doubt that forests and woodlands continue to be a key source of products needed for everyday life for many communities around the world. Indeed, in most instances it makes economic sense to continue to use NTFPs. Without access to these products, households would be worse off and would be forced to use scarce cash resources to purchase basic essentials such as energy and food. Subsistence use of NTFPs thus contributes to reducing vulnerability by ensuring all households have access to at least some of their basic needs at no or little cost. This function can be thought of as a “daily safety net” (Shackleton and Shackleton 2004).

3.3 Trading and Commercialisation: NTFPs for Income Generation

3.3.1 NTFPs for Cash: A Growing Business

Apart from subsistence consumption, the sale of NTFPs offers an important means for rural and urban individuals and households to generate cash income (Shackleton et al. 2007a, b). For example, in sub-Saharan Africa alone it is estimated that several million people earn their primary cash income from the sale of forest products (Kaimowitz 2003). In the forest zone of southern Ghana about 20% of the economically active population earns income from selling forest products,

while in the Brazilian Amazon about 1.5 million people derive part of their earnings from NTFPs (Ruiz Pérez and Byron 1999). In South Africa, some 3–14% of rural households within the savanna biome [roughly 230,000 households (Statistics South Africa 2003)] are trading at least one NTFP, albeit often on an irregular basis (Shackleton and Shackleton 2004).

This extensive trade in NTFPs appears to be growing worldwide (Neumann and Hirsch 2000; Campbell et al. 2002; Ruiz Pérez et al. 2004, Table 3.6). Growth is being driven at the local level by a greater need for cash income as households become more integrated into the market economy and have higher expectations, and by economic hardship and increased vulnerability due to, among other factors, unemployment, withdrawal of agricultural subsidies, and HIV/AIDS (Monela et al. 1999; Campbell

Table 3.6 Examples from around the world of the extent, size, and value of the trade in different NTFPs (also see Chap. 4)

Medicinal plants	Bangladesh – some 12,000 tons of dried medicinal plants worth around USD 4.5 million are sold annually from rural areas (SEDF/IC 2003). Southern Africa – the trade in medicinal plants is valued at USD 75–150 million per annum with some 35,000–70,000 tons of plant material traded each year (Mander and le Breton 2006)
Baskets	Botswana – commercial buying started in early 1970 in Ngamiland District. In that first year USD 500 worth of baskets was bought from a handful of women, by 1990 this increased to USD 115,000 per year to more than 2,000 women. By 2000 the value of the trade was some USD 350,000 per year
Gums and resins	Ethiopia – the value of gum and resin exports from 2001 to 2003 amounted to USD 2.8 million, 3.3 million, and 4.1 million respectively. Natural gum tapping and collection activities create seasonal employment opportunities for 20,000–30,000 people (SNV 2005)
Woodcarvings	Kenya – the woodcarving industry is worth over USD 20 million annually in export products and employs some 60,000–80,000 carvers supporting over 400,000 dependents (Choge 2004)
Honey	Zambia and Tanzania are two dry forest countries exporting the largest volumes of honey. In Zambia in 2005, 219 tons of honey were exported with a value of USD 491,000, while Tanzania exported 466 tons with a value of USD 674,000. Volumes exported have risen by 20–30% since 2001 (ITC 2006)
Oils – Shea butter	Burkina Faso – shea butter provides income to about 300,000–400,000 women (Harsch 2001; Schreckenber 2004). Imports of shea butter to Europe from Sahelian countries were estimated at USD 13 million in 1999 (Schreckenber 2004)
Insects	Botswana – the trade in mopane worms was valued at UK£4.42 million in 1995 and employed as many as 10,000 local people (Styles 1994; 1995)
Wood and charcoal	Tanzania – in 2002 some 21.2 million m ³ of wood, equivalent to 625,500 ha of woodland, were used for 43.7 million bags of charcoal with a net annual value of USD 4.8 million (Scurrah-Ehrhart and Blomley 2006). Burkina Faso – the fuelwood commodity chain of the city of Ouagadougou is estimated at USD 10.6 million (Ouedragogo 2006)

et al. 2002; Shackleton et al. 2008). Additionally, NTFP commercialisation is being promoted and facilitated through the creation and stimulation of external markets by agencies concerned with linking rural livelihoods to the conservation of natural ecosystems (Neumann and Hirsch 2000; Arnold and Ruiz Pérez 2001, Chap. 10). These interventions are generally aimed at addressing the dual goals of livelihood enhancement and biodiversity conservation, based on the assumption that the livelihood benefits obtained from selling NTFPs will provide an incentive to conserve the resource base (Arnold and Ruiz Pérez 2001, Chap. 10). Consequently, it is not uncommon to find building materials, fuelwood, charcoal, indigenous food-stuffs, medicines, craft items (from wood, grass, reeds, vines), furniture (e.g., Figs. 3.1, 3.2, 3.3 and 3.4), and other more specialised products such as resins, paper, and perfumes for sale in local, national, and even international markets (de Beer and McDermott 1996; Alexiades and Shanley 2004; Sunderland and Ndoye 2004; Marshall et al. 2006).

For some households, NTFPs may be an obvious source of cash because their production and harvest requires little capital and labor inputs, and people have the knowledge and skills to undertake these activities. These low barriers to entry combined with the fact that, in many instances, access rights are held in common and so tenureship may not be claimed by more powerful individuals and groups (Beck and Nesmith 2001), means that this activity provides an important option for poor and marginalised households (Beck and Nesmith 2001; Fisher 2004; Shackleton et al. 2008). These are typically households who would have difficulty accessing other employment opportunities, or who are less able to cope with or insure against risk than better-off households (Fisher 2004; McSweeney 2004; Takasaki et al. 2004). Women in particular benefit widely from the use and sale of NTFPs (Box 3.2), as do older and less educated people who cannot compete effectively in the job market, and young households with few liquid assets (Schreckenber and Marshall 2006). For example, the Shea butter trade in Burkina Faso provides income to some 400,000 women (Table 3.6). NTFPs may also be harvested by children, and, at times, might be the only source of cash that they are able to secure for themselves or their households (McGarry and Shackleton 2009a; Fig. 3.4).

3.3.2 *Why Trade in NTFPs?*

Conceptually, there are four main reasons why people might engage in the trade of NTFPs, with some households trading for all of these reasons. Applying the typology presented below, and thinking about each reason separately, can help us understand the role that the sale of NTFPs has to different categories of people and households, and in different contexts and situations.

1. *Trading NTFPs in response to emergency or misfortune:* One reason people might trade in NTFPs is that these products can provide cash in times of emergency or misfortune. In this case, NTFPs can be considered as a form of natural insurance (Pattanayak and Sills 2001; McSweeney 2004; Takasaki et al. 2004, Box 3.3) available at critical times to bridge income gaps, deal with shocks, or to meet specific needs

such as school fees or the costs of celebrations. Such trade may exist on a regular basis, but increase in times of shock, such as harvest failure. In these situations these products function as safety nets, providing people and households with fallback options (McSweeney 2004, 2005; Takasaki et al. 2004). For example, following the devastation left by Hurricane Mitch in Honduras in 1998, McSweeney (2005) showed that households unable to recoup their landholdings sold forest products to self-insure despite government enforcing a ban on forest product exploitation.

2. *Trading NTFPs for livelihood diversification, risk reduction, and income smoothing*: Another reason for trading NTFPs is that the latter may be part of an income diversification or risk reduction strategy, as households or individuals seek ways to supplement other sources of income or smooth their earnings throughout the year. For example, the NTFP trade often complements agricultural production in many regions of the world (Ros-Tonen and Wiersum 2005). In such cases, the use of NTFPs is complementary to a range of other livelihood activities and income sources. “Income smoothing” is a widely mentioned benefit of NTFP trading, especially at times when on-farm labour is in low demand. For example, in south-eastern Nigeria 35.7% of the rural population collected NTFPs daily, and the income from the sale of these NTFPs accounted for 94% of the total income from minor sources, providing a considerable smoothing effect, especially during hunger periods (Nweze and Igbokwe 2000).

3. *Trading NTFPs as a regular or primary source of income and as a “stepping stone” out of poverty*: Some households may trade NTFPs to gain regular sources of income. In such cases, the trade may be the primary source of income for the household, resulting in high levels of specialisation (Ruiz Pérez et al. 2004; Kusters and Belcher 2004). Such a scenario is most likely for high value-added products, often with external markets (e.g., woodcarving in Bali, Rohadi et al. 2004; Chap. 4). As such, relatively few households find themselves in this position because of the relative scarcity of NTFPs with large external markets and the higher barriers to entry for such products (Marshall et al. 2006; Belcher and Schreckenber 2007). In these cases, if the value of the product increases significantly, then the danger exists that the trade will be captured by elites, or the NTFPs will be exhausted after a few years (Dove 1993). Often engagement in the NTFP trade as a “stepping stone” is a matter of choice rather than necessity (Marshall et al. 2006; Schreckenber et al. 2006).

4. *Trading NTFPs due to a lack of alternatives*: The last reason households may trade in NTFPs relates to a lack of other livelihood or cash income choices. It is not uncommon to find that individuals and households turn to the informal economy, in this case the sale of readily accessible products, in the absence of alternative income earning opportunities (e.g., Shackleton et al. 2008). Such a situation could be considered as a necessity diversification response (Marshall et al. 2006). However, unlike the short-term safety net functions described above, this may evolve into a long-term source of livelihood if the conditions that initially drove the individual or household into the trade prevail, or if the trade becomes a preferred option. For example, the majority of hardwood carvers in Bushbuckridge, South Africa, have been in business for 30–50 years, and this is despite having started carving as a temporary fallback option after becoming unemployed (Shackleton 2005). Carvers

mentioned how working from home (rather than being migrant workers), being with their families, as well as making adequate income were the primary reasons they decided to continue with the trade.

It is usually the poorest households that have most incentive to trade NTFPs. Wealthier households often have access to alternative sources of cash that are denied to the poorest because of economic barriers to entry, be it livestock husbandry that needs the initial animals or trade that needs a means of transport. However, it is not necessarily always the poorest members of the community who engage in these activities. Ambrose-Oji (2003) argued that in Cameroon the households that are more actively involved in the collection and trade of NTFPs are middle-income households, probably in a “diversification and risk reduction strategy”. At times, the poorest members of the community may collect NTFPs in the forest, while middle-income households market these in local towns, allowing them to control a larger proportion of the economic surplus, thus cementing economic inequalities. In India, Campbell et al. (1995) stated that poor rural NTFP collectors receive as little as 10–40% of the sale price in the nearest NTFP market. In other cases, NTFPs are said to have the potential to reduce economic inequalities, since they allow poor members of the community, with limited investments, to earn cash. Fisher (2004), for example, argues the latter after finding that the NTFP trade in Malawi had an income equalising effect. Similar results were found by Shackleton et al. (2008) for four products traded in the north-east of South Africa (Fig. 3.5). Moreover, the poor often sell locally to the more wealthy, thereby distributing local cash more widely from rich to poor (Shackleton and Shackleton 2006; Paumgarten and Shackleton 2009).

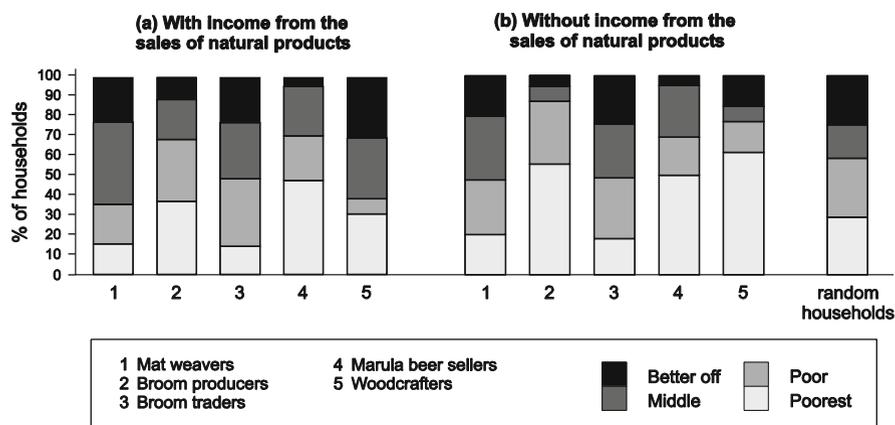


Fig. 3.5 Proportion of households (hh) for each product type that fall within four total annual household cash income classes when: (a) the net annual income obtained from the sale of natural products is included and (b) when the net annual income obtained from the sale of products is excluded. Classes are based on quartiles for the random household sample, where poorest = \leq ZAR 3,600; poor = $>$ ZAR 3,600–8,400; middle = $>$ ZAR 8,400–15,090, and better off = $>$ ZAR 15,090 to highest (Shackleton et al. 2008)

Table 3.7 Average and range of incomes generated from small-scale local trade in NTFPs in South Africa (Shackleton et al. 2007a)

Resource	Mean annual income (South African Rand)		Range (ZAR)	Year
Palm brushes	4,272	Net ^a	0–12,000	2002
Marula beer	500 (2 mths)	Net	90–2,230	2001
Fuelwood	338	Gross	12–1,400	1999
Medicinal plants	16,740	Gross	360 to >40,000	1999
Woodroses	2,895	Gross	640–6,000	1997
Softwood carvers	9,840	Net		1997
Medicinal plants	39,480	Gross		1996
Hardwood carvers	3,600	Net	2,580–16,930	1994
Mopane worms	2,500 (1 mth)	Gross		
Aloe gel tappers	12,000	Net		1994
Wild fruits	1,045	Gross	240 to >20,000	1993

^aGross income excludes costs while net income represent profits after deducting costs

3.3.3 Varying Benefits for Different Households

Average incomes from the trade in NTFPs, at local or international level, are often marginal, amounting to a few hundred dollars per year (Table 3.7). For this reason it is frequently argued that NTFPs have little role in contributing to the fight against poverty (Wunder 2001). However, the ranges of income for a single product can be considerable, with some households doing well based on high levels of involvement and inherent entrepreneurial ability, while others opt to make the trade a more part-time, supplementary activity (e.g., Marshall et al. 2006; Shackleton and Campbell 2007). In other instances, as previously mentioned, incomes may be unevenly distributed along the market chain, with some actors doing much better than others. Indeed, Marshall et al. (2006) found that many households wanted to find ways to move onto another stage of the value chain to improve their incomes. Thus, while on an average incomes may not appear lucrative, a closer look suggests that it is misleading to make generalisations, as revenues and contributions are highly variable from household to household and product to product (Table 3.7). NTFP incomes cannot be considered in isolation of (a) other livelihood activities; (b) the overall income stream of households; (c) local wage rates; (d) alternative employment options, and (e) the constraints producers and traders face.

3.4 NTFPs in Reducing Vulnerability and Alleviating Poverty

In this section we draw on the above discussions to consider how NTFPs contribute to the global goal of poverty alleviation. We consider poverty alleviation in its broadest sense, which includes notions of (a) reduced vulnerability and greater security; (b) poverty avoidance, prevention or mitigation, i.e., preventing poor

people and households from slipping deeper into poverty; and (c) poverty reduction or elimination, i.e., assisting people to escape poverty or raise household incomes above the poverty line (Angelsen and Wunder 2003). These understandings parallel the three sets of policy measures suggested by May et al. (1998) that might be used to alleviate poverty, namely (a) protective measures which are essentially safety net and disaster management measures that provide relief from deprivation; (b) preventive measures that try to avert deprivation, and (c) promotional activities that aim for an improvement of incomes and social consumption.

We have shown above that NTFPs can serve the function of reducing household risk and vulnerability (Box 3.3, Box 3.4), often helping to prevent households, particularly the poorest (Rueff et al. 2009; Shackleton et al. 2008), from sinking lower into poverty during difficult times. NTFPs are accordingly critical in building household resilience, a factor that is likely to become even more important, given the dire predictions around climate change. Thus, the conservation of natural capital, i.e., forest and woodlands, can, according to May et al.'s (1998) typology, prevent and avert deprivation and provide relief from deprivation (see Box 3.4, Babulo et al. 2009). Under these circumstances, NTFPs can be thought of as a safety net and key in mitigating poverty. A safety net is generally regarded as a source of emergency sustenance in times of hardship. Safety nets are mechanisms that mitigate the effects of poverty and other risks on vulnerable households (World Bank 2004). In the poverty literature, the term is often used to refer to public social security transfers such as unemployment benefits, child grants, pensions, subsidies, relief aid, etc., as well as the informal transfer of goods between households (World Bank 2004). In this case, it is the existence of natural capital that can be sustainably drawn in times of need that constitutes the safety net. Biodiversity and forest products, in other words, provide a form of insurance or cushion against risk, often when little else is available (McSweeney 2004).

Box 3.3 Role of NTFPs as a Way to Cope with Shocks in Two Regions of South Africa

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A study conducted in two rural villages in South Africa examined the safety net function of NTFPs by determining the households' vulnerability context (i.e., the range of crises, both anticipated and unanticipated, experienced over a 2 year period) and the various coping strategies households rely on. Household wealth was used for comparison. All households reported at least one crisis. In response to these, households relied on a range of coping strategies (Table 3.8). NTFPs were used in response to each crisis offering both consumption- and income-smoothing options.

(continued)

Table 3.8 General coping strategies employed by households in response to anticipated and unanticipated crises (%)

Coping strategy	Total	Wealthy	Poor	X^2	Significance
Kinship	85	80	90	1.9	>0.05
Reduced spending	74	84	64	5.2	<0.05
Changed diet	72	84	60	7.1	<0.05
Saves/budgets	72	88	56	12.7	<0.05
NTFPs	70	68	72	0.2	>0.05
Selling livestock	44	58	30	7.9	<0.05
Stokvels	41	64	18	21.9	<0.05

Table 3.9 NTFPs used as a rural safety net, how the use manifests and the proportion of households using (of households reporting the safety net function)

	Total	Wealthy	Poor	X^2	Significance
Edible herb (fresh)	30.0	29.4	30.6	0.0	>0.05
Edible herbs (dry)	17.1	14.7	19.4	0.3	>0.05
Medicinal plants	40.0	38.2	41.7	0.1	>0.05
Edible fruits	11.4	8.8	13.9	0.4	>0.05
Bushmeat	7.1	0.0	13.9	5.1	<0.05
Fuelwood	25.7	41.8	11.0	8.3	<0.05
Sells fuelwood	10.0	0.0	19.4	7.4	<0.05
Building materials	8.6	2.9	13.9	2.7	>0.05
Sells other NTFPs	8.6	0.0	16.7	6.2	<0.05

With the exception of NTFPs and kinship, all the strategies were relied on by a significantly greater proportion of wealthy households, highlighting that a household's asset base determines the coping strategies at their disposal. For poor households, the use of NTFPs fell within the top three strategies in terms of proportion households.

Of the households that relied on NTFPs in response to crises, 40% used medicinal plants, 30% fresh herbs, 25.7% fuelwood, 17.1% dried herbs, 11.4% fruits, 8.6% construction materials, and 7.1% bushmeat. Ten percent sold fuelwood and 8.6% sold other NTFPs (reed mats, bushmeat, and grass hand-brushes). Although both wealthy and poor households relied on NTFPs, wealth influenced both the products selected and the manifestation of the safety-net function (Table 3.9). For example, no wealthy households sold NTFPs, and a significantly greater proportion of wealthy households relied on fuelwood (as a cost-saving substitute for paraffin).

The safety net function of NTFPs is particularly important to poor households with limited insurance options, although wealthy households also rely on certain products. Findings of the high proportion of households relying on NTFPs as a safety-net recommends further research and suggests that the maintenance of and continued access to communal lands and the resources provided may contribute significantly toward sustaining and improving the welfare of rural households.

Box 3.4 Using Changes in Welfare to Measure Forest Resource Value

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Poor rural households typically operate within a complex and risk-prone environment facing a variety of risks on a daily basis. Despite recent studies indicating the critical role of dry forests in mitigating the effects of extreme poverty in sub-Saharan Africa (Campbell et al. 2002; Shackleton and Shackleton 2004), many African governments still fail to make the link between continued degradation of dry forests and increasing poverty. One explanation could be that forest value is predominantly measured with market-value techniques, e.g., indicators such as Direct Use Value (DUV) (the resource quantity consumed and sold, multiplied with their market price). Because DUV is based on market prices, it may not accurately illustrate dimensions which are not captured in an incomplete market, such as opportunity costs.

This study tested this premise, comparing DUV techniques with stated-preference techniques, which uses hypothetical prices stated within an ideal/perfect market which captures all externalities accurately (Tincani 2009). Over 100 households (131) were surveyed within nine villages in rural Burkina Faso in May–July 2008. A hypothetical scenario was used, where the respondent was asked what amount he/she would be Willing To Accept in Compensation (WTAC) for a *marginal* loss (1 ha decrease) in his/her forest resources, over a *limited* time period (one season, lasting 4 months). Throughout this period, a foreigner would rent 1 ha of trees, which would be inaccessible to the respondent throughout the rental-period. The question was phrased to measure the minimum WTAC needed to maintain the same standard of living throughout the rental-period.

Results showed that households with fewer financial, physical (material wealth and livestock), natural, and human assets reported a significantly higher WTAC/ha. These asset-poor households had fewer assets to sell when they needed to buy food in the dry season, and had less labour available to earn money to buy food, therefore suggesting a predisposition to using public assets such as forest resources to maintain their standard of living. As confirmed through focus groups, these asset-poor households relied on the forest for their food, firewood, fodder, and medicinal herbs in the dry season.

Contrarily, DUV/ha was not significantly higher for asset-poor households. WTAC/ha far exceeded DUV/ha for asset-poor households, but both values reached similar levels for asset-rich households with incomes of >700,000 CFA/season. Contrarily to DUV, WTAC values included the opportunity cost of forest resources. This cost was highest for poor households, because these lacked the capital to replace forest resources with a

(continued)

purchased substitute. As household income increased, the opportunity cost declined, and WTAC/ha reached similar values as DUV/ha.

These results show that different methodologies capture different aspects of resource value, with WTAC highlighting opportunity costs, which are particularly relevant to poor households. As these households lack alternative coping strategies, forest products play a vital part in helping poor people cope with hardship. Employing this methodology, which can measure this vital safety-net role, will help to highlight the importance of this function and its important role in increasing households resilience in the face of shocks.

It is apparent from the discussions so far that extensive evidence exists to support the critical role that the NTFPs play in reducing vulnerability, providing useful goods and modest cash income to some of the poorest sectors of society, thus increasing livelihood security and diversification (e.g., Alexiades and Shanley 2004; Kusters and Belcher 2004; Sunderland and Ndoye 2004). However, it is less clear how these products contribute to the third type of poverty alleviation, i.e., poverty reduction or elimination. Can these products assist people to escape poverty, accumulate assets, and improve their standard of living, certainly in any enduring way?

We have discussed how average cash returns are often quite modest for forest products traded in both local and international markets, but we need to see these incomes in the local context and in terms of their wide variability across households (Table 3.4, Shackleton et al. 2007a, b, 2008). There are many individuals and households who are doing well out of NTFP trading, but the numbers are much smaller than those relying on NTFPs for other purposes. Certainly where conditions are conducive and the opportunities for expanded trade have been harnessed and supported, there is evidence to indicate that livelihood and financial benefits can be both raised and extended to much larger numbers of people (Marshall et al. 2006).

However, it is often only in combination with other sources of income that NTFPs may provide a pathway out of poverty. For example, Fisher (2004) and Shackleton et al. (2008) have shown that the sale of forest products together with other sources of income can reduce the proportion of households in the lowest income classes (Fig. 3.5). Similar results were found by Babulo et al. (2009) in Tigray, northern Ethiopia. They showed, using poverty and inequality analyses, that incorporating environmental incomes into household accounts significantly reduced measured poverty and income inequality. Detailed case studies of NTFP commercialisation in Latin America (Marshall et al. 2006) show that the income from NTFP sales may be used to build household physical assets (roofing, fencing, etc.), as well as human capital through providing fees for the schooling and training of children. Thus, while NTFPs seldom make people rich, they are often important

in improving quality of life and for ensuring that the next generation has more choices through their contributions to schooling costs. NTFPs can enrich users' lives through, for example, nutritional enhancement and cultural meaning (Kepe 2007), even if such people may be considered "cash poor". Forest dwellers do not necessarily see the use of NTFPs as fitting any of the categories proposed by external commentators, but rather as a way of life that is place based and unique to them (also see Chap. 5).

3.5 Conclusions

While this chapter demonstrates that NTFPs contribute in a variety of ways to the wellbeing and livelihood security of rural and urban households globally, it is apparent that the relationship between people and forest resources is extremely complex, multifaceted, and dynamic. Households are constantly adapting their livelihood strategies to changing circumstances, taking up or dropping their use of and trade in these products in response to a variety of factors (Arnold 2002; Campbell et al. 2002; McSweeney 2004). This complexity undermines and confounds the ability to obtain a comprehensive understanding and generalised picture of the extent to which NTFPs can secure livelihoods, alleviate poverty, and reduce vulnerability now and in the future, and further research is still needed to shed light on this issue (FAO 2003; Angelsen and Wunder 2003, Chap. 1).

Overall, NTFPs tend to be more influential in mitigating or preventing the intensification of poverty than providing pathways out of poverty. This does not, however, mean that they are unimportant and should be dismissed as having little potential in addressing the Millennium Development Goals. Indeed, NTFPs contribute to the welfare of millions of households worldwide, households that would be a lot worse off if they did not have access to these products for daily use, or as a form of insurance in hard times. There is thus a need and obligation for governments worldwide to underpin the safety net offered by forest biodiversity, and to recognise its key importance in subsistence and poverty prevention. At the same time, it is essential to support those people who have turned to NTFP trading as a means to make ends meet in the absence of alternatives and under increasingly harsh economic conditions. The opportunities offered by NTFP commercialisation should be seen not as a silver bullet (as is often the case), but rather as one component of a multisectoral approach for tackling rural and, increasingly, urban poverty. Thus, "NTFP trading alone is not the answer, but nor is arable production, livestock rearing, migrancy, or state welfare grants. It is only through the integration of these livelihood sectors that there will be any lasting positive impact on the welfare of the rural poor" (Shackleton et al. 2008). In terms of the urban poor, it needs to be recognised that NTFPs form a key link in the urban–rural continuum and provide extended opportunity for urban processors and traders, in particular women, as well as an affordable source of goods for consumers.

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