

Chapter 2

Evolving Perspectives on Non-timber Forest Products

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Abstract Many individual non-timber forest products (NTFPs) were historically mainstream trade commodities, but their diminished importance in international trade after World War II meant that they become almost invisible in forest statistics, management, and policy. They were rediscovered as a category in the late 1980s, provoking high hopes by many, suspicion by some, and a new research agenda on their potential role in the sustainable development of tropical forest regions. This was followed by general disenchantment with NTFPs that dominated the literature and policy discussion at the turn of the century, which in turn gave way to today's more nuanced understanding and policy recommendations, as described in many chapters of this book. We identify four themes in recent literature that serve as guideposts to a realistic and moderate assessment of NTFPs (1) centrality of culture

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and tradition, (2) local and regional markets, (3) value of diversity in and of itself, and (4) continuum of forest management.

2.1 Introduction

Over the past quarter century, the dominant narrative about non-timber forest products (NTFPs) swung from optimism to pessimism about their potential to alleviate poverty and encourage conservation. In this chapter, we first provide historical context, then describe the motivations, assumptions, and operating principles of the optimists and pessimists. Out of this debate, there is emerging a new middle ground of research and policy that focuses on NTFPs that are grounded in cultural traditions, that are traded in local and regional markets, and that are managed in subtle ways across a spectrum of forest types. These NTFPs make up a diverse basket of products that insure and enhance the quality of life of forest users.

2.2 History

Although not always termed NTFPs, such products have been used and traded for centuries. Consequently, their roles and importance in trade and societies have varied through time from key commodities during periods of early colonial conquest to secondary or minor resources, and once again more recently back in the international spotlight.

2.2.1 *Mainstream*

Historically, many NTFPs were key global commodities and an important component of international trade, driving the fabled spice trade between Asia and Europe, expanding in the colonial period with products such as shea butter (*Vitellaria paradoxa*) and gum Arabic (*Acacia* spp.) from Africa, and feeding the industrial revolution with products such as rubber from the Amazon (*Heavea brasilienses*). The economic importance and often exploitative nature of the international trade in NTFPs are amply documented in case studies of particular products [e.g., Weinstein (1983) on rubber in the Amazon, Hanson (1992) on gum Arabic in West Africa, Peluso (1992) on rattan in Indonesia] and in the history literature (Wolters 1967; Turner and Loewen 1998; Donkin 2003).

2.2.2 *Invisible*

After World War II, the relative importance of NTFPs in international trade declined, as exports of tropical timber increased and advances in “inorganic, and especially petroleum-based, chemistry led to the replacement of forest products

such as gums, resins, fibers, and medicines by cheaper synthetic alternatives”, incentivised in part by disruption of supplies during the war (Alexiades and Shanley 2004). The decline of NTFPs in international trade was paralleled by their disappearance from the international forest policy agenda. For example, the summary of the first World Forestry Congress in 1926 made several references to “forest products other than wood” such as barks, resins, saps, and leaves, but by the seventh World Forestry Congress, the summary made just brief reference to “the social potential of the rather neglected section of minor forest products”. According to Padovani (1995), the FAO stopped collecting and publishing data on NTFPs in 1971. A major report on *Tropical Forest Resources* produced by FAO and UNEP in 1982 focused almost exclusively on timber and fuelwood. As described in Box 2.1, this reflected global concern about a “fuelwood crisis”, which temporarily drew international attention to fuelwood supply, in the same way that international

Box 2.1 Evolving Perspectives on Fuelwood

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Over the last 40 years the prevailing view on fuelwood has fluctuated dramatically. In the 1970s, as rising fossil fuel prices focused attention on energy, it was widely noted that fuelwood was the predominant household fuel for most of the developing world. When initial estimates of future fuelwood supply (based on forest growth) and future demand (based on population growth) indicated a growing gap between supply and demand, massive deforestation and declining welfare for fuelwood-dependent households were envisioned. This became referred to as the “the other energy crisis” or the “fuelwood gap”. In response to this perceived crisis, forestry programs to increase fuelwood supply and improved stove programs to encourage efficient fuelwood use increased dramatically (Cooke et al. 2008).

By the mid 1980s, however, it became evident that many fuelwood oriented programs were not meeting expectations. Additionally, new household-level research indicated that fuelwood generally came from easily regenerating twigs and woody scrub, that scarcity of fuelwood could be driven by labour shortages even when forest resources were abundant, and that households responded rationally to economic scarcity of fuelwood by both conserving fuelwood and switching to substitutes (Arnold et al. 2006). The view that prevailed in the 1990s was that fuelwood use was not a major cause of deforestation, and that most households did not see fuelwood scarcity as a big problem. Fuelwood-related programs were sharply cut back.

In the 2000s attention began to turn again to fuelwood, which is still the predominant fuel for rural households in much of Africa and South Asia, even though its use has declined in some areas due to urbanisation and income growth. It is now recognised that in some circumstances fuelwood scarcity can have very adverse consequences for household welfare (Arnold et al. 2003; Cooke et al.

(continued)

2008). In addition, attention has been drawn to fuelwood due to its connection to climate change. As a renewable, nonfossil fuel, fuelwood has links both to energy policy and carbon sequestration programs. It remains to be seen how this will play out in policy, and how policy will impact fuelwood users.

attention would later be temporarily focused on commercialisation of nonwood forest products (NWFPs).

Throughout this period, researchers continued to generate case studies of specific NTFPs, including their ecology, harvest, processing, and trade (Robbins and Matthews 1974). This literature is well represented in the journal *Economic Botany* that was launched in 1947. However, as noted by Tewari and Campbell (1995), “botanists and anthropologists usually confined their interest to descriptions of the variety and local uses of long lists of species, without discussing management options or economic value”. Likewise, some Tropical Forestry Action Plans (TFAPs) made note of specific NTFPs, but Flint (1990) concluded that “even where nonwood products are considered [in TFAPs], they tend to be viewed in isolation, and the social and economic effects of, for example, increased logging or conservation on nonwood livelihoods are rarely considered”.

To the extent that NTFPs were considered as a class of products or activities, they were likely to be seen through the lens of “the tragedy of the commons” (Hardin 1968). This also characterised the approach of many governments throughout the tropics, who claimed forest areas that they perceived as open access and underutilised, in order to exploit the timber resources or “develop” the land (Lynch and Talbott 1995). Partly as a result of these policies, ongoing extraction of certain NTFPs in some places was undermined by degradation of the resource base (de Beer and McDermott 1996). However, as a general category, NTFPs remained central to the livelihoods of rural peoples, both utilised directly and actively traded in local and regional markets (Fig. 2.1).

2.2.3 Rediscovery

Between the 1987 publication of the Brundtland Report and the 1992 UN Conference on Conservation and Development, there was an explosion of interest in NTFPs. The scientific groundwork for this was laid by studies demonstrating the importance of NTFPs to rural peoples throughout the tropics, including India (Jodha 1986), the Amazon (Padoch 1988; Anderson and Jardim 1989), and Indonesia (Peluso 1983; Caldecott 1988a, b). New labels for this category of goods, including “non-timber forest products”, were introduced to the literature (Jacobs 1984). The International Tropical Timber Organisation (ITTO) commissioned a study on the multiple-use of tropical forests that would later be published as the influential book *Not by Timber Alone* (Panayotou and Ashton 1992). Terms that would become integral to the discussion were given prominence (if not coined)



Fig. 2.1 House and fishing tools made of bamboo and rattan, Northern Lao PDR (photo: Claudio Delang)

by Myers (1988) who wrote about “nonwood products”; Hecht et al. (1988) who described NTFPs as a “subsidy from nature”; and the Brundtland Report itself that made “sustainable development” into a widely accepted goal. This was driven home by the widely publicised economic analysis of Peters et al. (1989).

This new interest in NTFPs dovetailed with several other trends in the same time period. First, common property regimes (CPRs) and community-based natural resource management (CBNRM) were garnering new interest and respect from researchers and international donors (Bromley and Cernea 1989; Ostrom 1990; Poffenberger 1990; Menzies 2004). Second, there was increasing recognition of the potential value of traditional ecological knowledge (TEK) for understanding and managing ecosystems (Berkes 1993). Third, environmental organisations, such as the World Wildlife Fund under its Wildlands and Human Needs Program, were seeking to integrate development into their conservation programs for protected areas. Fourth, the international press gave increasing attention to the issue of tropical deforestation, partly motivated by the massive forest fires in Indonesia in 1986 and the Brazilian Amazon in 1987.

In this period, the timber industry was widely blamed for a “deforestation crisis”, and there were many calls for boycotts of tropical timber imports. The concept of NTFPs as an alternative means of earning a livelihood from the forest was brought to prominence by the rubber-tappers’ movement in the Brazilian state of Acre. With support from anthropologists Mary Allegretti and Steve Schwartzman, the movement’s leader, Chico Mendes, gained national and international attention, founding the National Council of Rubber Tappers in 1985 and visiting Washington DC to testify to the US Congress in 1987. Mendes’ assassination in 1988 made international headlines and became a rallying point for advocates of the resource access rights of traditional forest-dependent people, specifically for collection of NTFPs.

In this setting, two 1989 publications crystallised a new paradigm for “sustainable development” of tropical forests. De Beer and McDermott published the first edition of their book on the economic value of NTFPs in Asia in 1989. This study is widely credited with establishing “non-timber forest products” as a category. The authors argued that “the key point of distinction between these materials and timber is that the latter is managed on an industrial scale by and for interests located well outside forest boundaries. While certain non-timber forest products may ultimately become inputs in to large-scale urban-based industries, all of them share the characteristic that they are extracted using simple technologies by rural people living in or near forests” (De Beer and McDermott 1996: 24). In the same year, Peters et al. (1989) published a two-page commentary in *Nature*, which was reported on the front page of newspapers such as the *Washington Post* and has since been cited over 600 times (according to Google Scholar, or 275 times according to Web of Science, by the end of 2010). They estimated the total market value of all products that could be harvested from a hectare of forest in the Peruvian Amazon and presented this as a compelling economic argument for an alternative to timber logging and deforestation.

These publications coincided with and contributed to great interest in NTFPs from tropical forests. In December of 1989, the National Wildlife Foundation convened a conference in the US on “Extractive Economies in Tropical Forests: A Course for Action”, which led to an edited volume by Nepstad and Schwartzman (1992). This was soon followed by other international conferences, such as “Rainforest Harvest: Sustainable Strategies for Saving the Tropical Forests?” convened in the UK in 1990 by Friends of the Earth (Counsell and Rice 1992) and “The Sustainable Harvest and Marketing of Rain Forest Products” convened in Panama in 1991 by Conservation International and the Asociación Nacional para la Conservación de la Naturaleza (Plotkin and Famolare 1992). The prefaces to these conference proceedings lay out the case for NTFPs: “The ancient practice of extracting economically valuable, non-timber forest products (NTFPs) leaving the forests structurally and functionally intact, has emerged as a possible means of reconciling the conflicting roles of tropical forests” (Nepstad and Schwartzman 1992); “Unlike wood, non-timber forest products (fruits, fibers, medicines, and so forth) can often be harvested without any damage to the ecosystem” (Plotkin and Famolare 1992); “Governments, scientists and environmentalists now generally regard ‘extractive management’ of tropical forests as a realistic and economically feasible alternative to conventional logging and clearance” (Counsell and Rice 1992).

These conferences reflected a strong geographic focus of both research and political action on South America and Southeast Asia (cf. Neumann and Hirsch 2000: 11). The promised “win-win” of marketing NTFPs seemed most compelling in these regions, where both biodiversity and traditional peoples were threatened by rapid loss of vast rainforests. Attention focused on the Brazilian Amazon in particular, due in part to the symbolic rallying point of Chico Mendes’ assassination, to early political success with the declaration of extractive reserves, and to high-profile marketing campaigns by the Body Shop and Cultural Survival Enterprises. Perhaps because of the recent boom in exports (de Beer and McDermott

1996), rattan from Kalimantan and other parts of Southeast Asia also figured prominently in the discussions.

This rediscovery of NTFPs did not make as big a splash in Africa. Neither the popular nor the scientific press significantly increased coverage of African NTFPs in this period, with a few exceptions such as the well-known ODI study on NTFPs in Ghana (Falconer and Koppel 1990). Perhaps the most obvious explanation is that this time period was marked by numerous other crises in Africa, including famine, civil war, and HIV/AIDS, all of which pushed forestry and the environment down the priority list. Another contributing factor is that many of the best-known products in this region are from dry forests or anthropogenic landscapes, collected by people as part of complex livelihood portfolios, as reflected in the Hidden Harvest Project (Guijit et al. 1995; Campbell 1996) which was in contrast to the people identified primarily as forest extractors in the perceived “pristine” rainforests of the Amazon and Kalimantan. A third explanation is that two of the best-known NTFPs in this region, bushmeat and fuelwood, are not as obviously appealing as nonwood plant products from an environmental sustainability perspective. Initiatives to recreate a local stake in sustainable management of wildlife resources, such as CAMPFIRE in Zimbabwe, drew on many of the same concepts as NTFPs (TEK, CBNRM, CPRs), but generally proceeded on a parallel track.

2.3 Reactions to the Renewed Profile of NTFPs

The explosion of interest in NTFPs provoked varied reactions that played out during the 1990s. First and best known, nongovernmental organisations and multi-lateral agencies moved quickly to establish programs to support the commercialisation of NTFPs. Second, there were early skeptics of both the sustainability and the development potential of NTFPs. Third, research organisations took up the challenge of assessing the potential and the necessary conditions for promoting “productive conservation” of forests via NTFP markets.

2.3.1 *Optimism*

In the early 1990s, efforts to develop the harvesting, processing, and international marketing of NTFPs were pursued with almost Pollyanna enthusiasm by nongovernmental organisations, donors, governments, and multi-lateral agencies, all animated by the potential for a win-win strategy to conserve forests while improving local welfare. This enthusiasm was also reflected in the creation of new programs focused on NTFPs, such as the FAO’s “Promotion and Development of Nonwood Forest Products” established under the Forest Products Division in 1991 and similar

programs at international environmental NGOs including Conservation International, Rainforest Alliance, and Friends of the Earth (Hidalgo 1992; Ehringhaus 2006).

These efforts were justified by a number of oft-repeated stylised facts about NTFPs. First was the assumption of negligible environmental impact of NTFP collection (e.g., Godoy and Feaw 1989; Sayer 1991). Second, as pointed out by De Beer and McDermott (1996), there was already a significant international trade in NTFPs (e.g., 150 products with total estimated value of USD 1.1 billion according to FAO 1997). Third, the total value of NTFPs in national economies was widely believed to be vastly undercounted in official statistics (Haripriya 2001; Puustjarvi et al. 2005; Hecht 2007), suggesting enormous potential to develop and bring these products into the formal economy. Fourth, there was optimism that new products and new uses of NTFPs would be developed (Unasylva 190–191). Combined, these beliefs suggested that there was a vast untapped opportunity to bring more NTFPs onto international markets. The international marketing strategy was further justified by concerns that local markets for unprocessed NTFPs are easily flooded and therefore offer low and unstable prices and limited incentive for sustainable use (Pendleton 1992; Padoch and Pinedo-Vasquez 1996).

In these early efforts, there continued to be a strong focus on the Amazon. As described by Coomes and Barham (1997), international NGOs entered the region “*en masse* to work with local communities in implementing a wide range of initiatives that promise, by supporting forest people’s traditional life and livelihood practices, to conserve the rain forest and promote locally-led development efforts. . . . Once considered the antithesis of forest preservation, forest product extraction by traditional groups has come to represent a major focus of hope and action for groups working in Amazonia”. One of the best-known efforts was Cultural Survival Enterprises (CSE), which sought to develop new products and new markets for NTFPs. In the 2 years after its launch in 1989, CSE convinced private businesses to place initial orders for 25 different NTFPs. However, they quickly ran into supply problems and sharp criticism over “rainforest crunch”, their most heavily promoted product from the Amazon (Gray 1990; Hanson 1992; Corry 1993).

While rainforest crunch was the most widely publicised failure, many of the early NTFP commercialisation initiatives struggled to make good on this seemingly obvious sustainable development strategy. This was partly due to a lack of understanding of existing commercialisation systems, and the challenges inherent to bringing change to those systems, such as lack of local experience with marketing, market instability, and the difficulty of building institutional relationships (1998 review of DFID projects, cited in Hughes and Flintan 2001). But projects also failed to take into account the broader context, including the heterogeneous and evolving livelihood strategies employed by local people, the multi-faceted services provided by traders and middle-men, and the mix of local and external deforestation threats (Hughes and Flintan 2001; Coomes and Barham 1997). Some organisations responded with longer term and more multidimensional interventions (e.g., members and grantees of Biodiversity Conservation Network and NTFP Exchange Program). But regardless, these initial challenges both lent

credence to the early skeptics and helped set the tenor of major research programs on NTFPs.

2.3.2 *Skepticism*

Early criticism of NTFPs as a basis for sustainable development flowed broadly in two veins. First, a number of anthropologists argued that linking forest people (and particularly indigenous people) to international markets had never done any good and was fraught with danger for those peoples. They further argued that the siren call of the “rainforest harvest” was drawing attention away from the real deforestation threats (Gray 1990; Hanson 1992; Corry 1993; Dove 1994). The second line of argument was that the economic basis of extractivism (Homma 1992) and of extractive reserves in particular (Browder 1992; Salafsky et al. 1993) was flawed. Based on his 1988 dissertation, Homma emphasised the historical regularity of market busts due to overexploitation, domestication, or substitution of NTFPs. Browder (1992) pointed out the fragility and narrow grounds for the apparent convergence of interests between the residents of extractive reserves and distant environmentalists. Two substrands of this critical literature emphasised the lack of data on the environmental sustainability of NTFP harvest (e.g., Redford 1992 on hunting by extractive populations) and the methodological flaws in the Peters et al. (1989) study, the strong assumptions of which continue to attract comment and criticism (Browder 1992; Cavendish 2000; Pyhälä et al. 2006).

2.3.3 *Research*

The quickly polarised and polemic debate over NTFPs proved fertile ground for researchers, as reflected in both the gray literature (e.g., global expert consultations on NWFPs organised by FAO in Tanzania in 1993, Thailand in 1994, and Indonesia in 1995) and scientific publications. Prior to 1994, only 33 publications in the Science Citation Index mentioned non-timber or NWFPs in the title or keywords, but for the 5 years from 1994 to 1998, the Index lists 111 publications on these topics (see Box 12.1). This was partly a change in labeling, with the terms NTFP or NWFP now attached to studies of particular products or production systems. These case studies employed diverse methods to examine diverse issues (Townson 1995). However, there were also efforts to systematically identify key research questions, recommend consistent methods, and synthesise knowledge.

Several of these efforts were grounded in economics. For example, in 1992, the Smithsonian Institution and the Harvard Institute for International Development convened a workshop that proposed a series of hypotheses to guide research on the role of NTFPs in local economies, published in a widely cited special issue of *Economic Botany* (volume 47). This workshop also gave greater prominence to

NTFPs in South Asia. In the same time period, the Hidden Harvest Project highlighted the role of NTFPs in agricultural systems and rural livelihoods in Africa, with particular attention given to subsistence foods (Scoones et al. 1992) and to the combination of participatory and nonmarket valuation methods to quantify local values of NTFPs (Campbell and Luckert 2002). Both of these efforts encouraged researchers to bring economic methods, including the household production framework and nonmarket valuation methods, to bear on NTFPs (as later reviewed by Wollenberg and Nawir 1998; Tewari 2000; Sills et al. 2003; Vedeld et al. 2004).

The impact of commercialisation on sustainability also emerged as a key research theme. Peters' (1994) "ecological primer" encouraged research on the ecological implications and management guidelines for NTFP harvest, as later reviewed by Wong (2000) and Ticktin (2004). This research found that sometimes commercial extraction of NTFPs was in fact not sustainable (e.g., Peres et al. 2003 on Brazil nuts). In 1995 and 1996, CIFOR hosted several workshops (in Zimbabwe, Spain, and Indonesia) that recommended focusing future research on the impacts of commercialisation on smallholder NTFP use, through systematic reviews of the literature and reporting of case study results (Ruiz Perez and Byron 1999). This led to a literature review by Neumann and Hirsch (2000), comparative case study research (Belcher and Ruiz Perez 2001; Ruiz Perez et al. 2004; Belcher et al. 2005), and examination of the potential role of certification (Shanley et al. 2005). The TROPENBOS Foundation pursued a similar line of research, focusing on identifying patterns and testing key hypotheses regarding commercialisation and sustainability of production (Ros-Tonen et al. 1995). DFID funded a third comparative research project, launched in 2000, to identify characteristics associated with successful NTFP commercialisation in Mexico and Bolivia (Marshall et al. 2006).

In the 15 years since this research agenda started to take shape, the literature has vastly expanded: the Science Citation Index lists 200 publications on non-timber or nonwood products from 1999 to 2003, 335 publications from 2004 to 2008, and 80 in 2009 alone. While the results of this research have always been nuanced and varied across products and sites, the predominant spin on the interpretation and discussion of those results has evolved over time.

2.4 Pessimism

By the turn of the century, enthusiasm over NTFPs had been deflated, as the complexity and constraints on increased commercialisation became more evident. As described by Ros-Tonen (2003), "the picture at the start of the new century is one in which optimism regarding the potential of NTFP extraction as a combined strategy for conservation of natural forests and poverty alleviation has waned, to be replaced with a more cautious approach or even forthright pessimism".

This reality check coincided with and was mutually reinforced by other trends in conservation and development, most notably disenchantment with attempts at

integration of these two goals. Integrated Conservation and Development programs (ICDPs) were increasingly criticised for failing to achieve either conservation or development outcomes (Wells et al. 1998; Hughes and Flintan 2001). There was a “resurgent protectionist argument” in favour of strict protected areas (Schwartzman et al. 2001; Wilshusen et al. 2002), and “green consumerism” was starting to lose ground to direct conservation payments, or payments for ecosystem services (Hardner and Rice 2002).

At the same time, there was a renewed focus on poverty alleviation (Arnold 2001; Maxwell 2001), with the Millennium Development Goals (adopted by UN member states in 2001) setting a new analytical framework for governments, donors, and researchers, including in forestry (Wunder 2001). While this could have created an opening for NTFPs as a key resource for the rural poor, there remained insufficient data on NTFPs to meet the standards of “evidence-based policy-making”. For example, participants in a workshop on Poverty Reduction Strategy Papers (PRSPs) in Africa identified both lack of statistics on NTFPs and poor dissemination and advocacy by the forestry sector as reasons that NTFPs are generally not considered in those plans (Paumgarten 2009). Further, there was growing suspicion that forests might contribute to rather than alleviate poverty, as evidenced by spatial convergence of tropical forests with areas of chronic poverty (Sunderlin et al. 2007) and the history of boom–bust economic cycles in NTFPs. International forestry assistance in general was becoming highly politicised, and perceived as “a no-win zone for donors” (Street 2006, ETRN NEWS 47/48, Economist 13 March 2003). This retreat from conservation was reinforced by the ascendance of other policy and aid agendas, including terrorism and public health.

In this context, it was easy to put a negative spin on the often-mixed outcomes of NTFP implementation projects and complex findings of NTFP research, focusing on the failure of NTFP commercialisation to “lift” people out of poverty. This new pessimism framed the academic and policy discussion, as illustrated in an introduction to a special issue of the *International Forestry Review* (IFR) that criticised earlier “exaggerated claims of economic potential [that] tended to overlook the great diversity of products referred to, in terms of biological characteristics, and social and economic value, whilst simultaneously ascribing unreasonably lofty and altruistic goals to some of the world’s poorest people”. The quintessential myth-busting refrain (cf. Spilsbury and Nasi 2006) became that “NTFPs are not a silver bullet”. This assessment was underpinned by a new set of stylised facts, replacing those of the previous decade and labeling NTFPs as inferior, substitutable, and unmanageable.

While claims that NTFPs are inferior are based on a variety of product characteristics (e.g., perishability, seasonality, etc.), the economic meaning of the term is that, all else equal, when incomes rise, demand falls. This holds true for some products such as wild foods that are not very palatable and natural materials that are not very durable. This can be reinforced by phytosanitary policies not adapted to and therefore imposing excessive costs on the NTFP trade. There is more evidence that the

share of income spent on NTFPs falls as incomes increase. For example, Cavendish (2000) found income elasticities between 0.3 and 0.5, and concluded that “dependence on and use of NTFPs is linked to poverty and to market failure rather than to household choice; the current prevalence of NTFP use by rural households is a result of their low incomes rather than the attraction of NTFPs themselves”. However, this needs to be tempered with cultural preferences (see Chaps. 5 and 6).

Many important forest products (e.g., *Hevea brasiliensis* and *Paullinia cupana*) have been substituted by either cultivated crops or synthetic products such as plastic buttons instead of vegetable ivory (*Phytelephas macrocarpa*) and industrially produced repellents in lieu of plant-based pesticides such as barbasco (*Lonchocarpus nicou*). This historical evidence buttresses the second stylised fact that NTFPs are inherently substitutable. In practice, specific products such as Brazil nuts, are more likely to be substitutable than general categories of products such as “nuts” or even “rainforest products”.

The third stylised fact is that tropical forests are not and cannot be actively managed for NTFPs. This assumption is embedded in definitions of NTFPs as products obtained from the “wild”, implying with no management of their regeneration and production. In the prototypical diverse tropical forest, in which individual species occur at low density, lack of management means that the marginal costs of collecting rise rapidly, resulting in low returns to labour. Depending on the plant part harvested, lack of management may also result in overexploitation, diminished vigour of populations, and economic exhaustion of the resource (Cunningham 2001; Ticktin 2004; Marshall et al. 2006). Prospects for technical solutions are constrained by incomplete scientific understanding of the complex ways that harvesting interacts with the species’ life cycles (see Chap. 7).

Different combinations of these three stylised facts underlie several heuristic models of NTFPs that strongly influenced the literature, policy discussions, and funding decisions starting in the late 1990s. Authors often alluded to these models without explicitly laying out the underlying assumptions. Perhaps the best known is the “boom–bust cycle” posited by Homma (1992) as an organising framework for the economic history of the Amazon. Homma (1992) argued that commercial extraction of the most valuable forest products in Amazonia follows a cyclical pattern, which is characterised by an initial stage of expansion, sometimes followed by a stabilisation phase, ultimately leading to a bust when the forest product is replaced by either synthetic substitutes or cultivation of the same or similar species. This model rests solidly on the assumptions that NTFPs are substitutable and unmanageable.

The boom–bust pattern inevitably imposes transition costs, as people who have invested in and become dependent on a particular product during the boom have to adjust to the bust. From a long-term perspective, the benefits of the boom may balance the costs of the bust, but these costs and benefits are unlikely to be equitably distributed. As Dove (1994) points out, when a resource gains value, elites who previously had no interest (or traditional tenure rights) in the product quickly take over its extraction, processing, and trade. These may be “local ‘elites’ with more

capital to invest, better connections, and better skills, or . . . competitors from other areas” (Belcher and Schreckenberg 2007). Regardless of who benefits, the proceeds of the boom may be invested in activities with higher immediate returns but less long-term sustainability (e.g., Escobal and Aldana 2003). Thus, a corollary of the boom–bust model is that the boom undermines local livelihoods.

NTFPs that do not enter international markets are often conceived of as “famine foods” that are inferior and substitutable, and by corollary, not worth managing. Early references to this concept emphasised the critical safety net function of NTFPs (e.g., Falconer and Koppel 1990; Koppert et al. 1993), but in the literature with a more pessimistic slant, it becomes almost synonymous with inferior and substitutable products (Delang 2006). While Pierce and Emery (2005) argued that the use of NTFPs as famine goods remains common during times of crisis throughout the world, more typically the label of famine foods is used to simultaneously recognise the livelihood importance while dismissing the policy importance on NTFPs. For example, Ogden (1996) asserts that “the collection, processing and preparation of such foods is time consuming and they are therefore being progressively abandoned with increasing commercialisation and degradation of forest resources”. Thus, in this model, famine foods are considered a stop-gap until markets and public policies can provide better alternatives.

A third model is of NTFPs as poverty traps: inferior goods with low prices that do not compensate for their high collection costs but cannot be managed to reduce those costs (Sheil and Wunder 2002). Belcher and Schreckenberg (2007) classify NTFP activities as poverty traps in cases “where decreasing prices nevertheless result in the need to increase harvesting to maintain a minimum income level”. Delacote (2009), referring to what is usually called a “common pool resource”, argues that “a poverty trap situation occurs when too much labour is allocated to common property resource (CPR) extraction. In this case, return to labour decreases by a simple tragedy of the commons effect, and the CP resource cannot properly insure the households anymore. Some households thus need to migrate, and the remaining households need to allocate all their labour to the CP resource which can only provide them with their minimum requirement. Thus they are trapped into poverty”.

As with most generalisations, the concepts of boom–bust cycles, famine foods, and poverty traps accurately characterise some but certainly not all NTFPs. For example, of the 61 cases in CIFOR’s comparative study of commercialisation, only 12% followed a boom–bust pattern (with contracted or unstable market). In a 2006 study of 10 products from 18 marginalised communities in Bolivia and Mexico, none of the NTFP activities were characterised as poverty traps (Schreckenberg et al. 2006). However, the pessimists’ heuristic models did serve as an effective antidote to earlier unrealistic expectations that NTFP commercialisation would automatically reconcile development and conservation objectives. Just as important, they encouraged researchers to broaden their sights beyond the highly visible and appealing NTFPs with potential international markets, to a new research agenda that aimed to uncover the actual (as opposed to potential) role of NTFPs in livelihoods.

2.5 Emerging Middle Ground

While the international community swung from optimism to pessimism about the potential to alleviate poverty and incentivise conservation through international markets for NTFPs, forest-dependent peoples continued to use and manage their forests in diverse ways to fulfill diverse functions in their livelihood systems. Between internationally traded NTFPs (which are considered at risk of boom–bust) and famine foods (which households consume only under duress), there is vast middle ground of NTFPs with demand grounded in cultural traditions, traded in local and regional markets, making up a diverse basket of products that insure and enhance quality of life, and managed in subtle ways across a spectrum of forest types. Over the past decade, these existing functions of NTFPs have come into greater focus in the scientific literature.

This transition was evident in the 2003 “International Conference on Rural Livelihoods, Forests and Biodiversity”, which included numerous papers examining how rural livelihoods depend on NTFPs (especially in Latin America), forest plantations and agroforestry systems (especially in Asia), and biodiversity (especially in Africa). Many of the papers re-stated the new conventional wisdom that commercialisation of NTFPs had been oversold as a one-size-fits-all solution. However, the conference themes also included the safety-net role of forests. And in his introduction to the special issue of *World Development* (volume 33, issue 9) resulting from the conference, Sunderlin (2005) noted “the complex ways in which forest resources help meet the needs of marginalised people. They can be crucial for mitigating or avoiding poverty, a fact not easily grasped by analysts who only focus on ways of lifting people out of poverty permanently” (Chap. 3).

Another challenge with understanding the multiple functions of forests is the great heterogeneity across products and settings, which has become increasingly apparent with expanded research on NTFPs in Africa (e.g., Shackleton et al. 2007, 2008) and in temperate (e.g., Emery et al. 2006) and boreal zones (e.g., Boxall et al. 2003). In this section, we identify four cross-cutting themes that are emerging in this recent literature (a) centrality of culture and tradition, (b) local and regional markets, (c) value of diversity in and of itself, and (d) continuum of often invisible forest management.

2.5.1 Culture

The cultural importance of forests extends well beyond their widely recognised role in indigenous and tribal customs. The literature documents the centrality of NTFPs in rural institutions and social networks across diverse settings. For example, in South and West Africa, marula fruit (*Sclerocarya birrea* subsp. *caffra*) and cola nuts (*Cola* spp.), respectively, help to maintain an important ethic of reciprocity, cultural norms, and social benefits that are central to rural livelihoods (Obeng and

Brown 2004; Shackleton and Shackleton 2006). Similarly, in the Appalachian mountain range of North America, the ritual of digging ginseng roots each spring season constitutes a social institution (Hufford 1997; Pierce 2002). Culture continues to shape use of NTFPs among people with a historical as well as a current connection to forested regions (Cocks 2006; Chaps. 5 and 6). People may simultaneously want to escape a forest-dependent existence, which for some can be isolated and deprived, and at the same time, yearn to maintain some connection with that existence (Pretty et al. 2009). One manifestation of this is the new trade routes that have been created as people who migrate to urban centers and around the globe take their culinary, craft, and healing traditions with them (Clark and Sunderland 2004; Stoian 2005; Padoch et al. 2008).

The market for NTFPs with cultural significance often places a premium on “wild harvested” products, meaning that they cannot be easily substituted by cultivated or synthetic products. This parallels the interest in “ethical consumption”, fair trade, and ecological certification, which also reflects concern with the production process and not just the final product. However, without a strong cultural connection, the international market for certified “green” or “fairly traded” food and health care products derived from NTFPs can be “extremely fickle and trend-driven” (Laird and Guillen 2002). Rai and Uhl (2004) provides a good example with the boom of the ‘uppage’ (*Garcinia gummi-gatta*) market when it was promoted as a weight-loss supplement and the bust of that market when scientific tests showed it to be “ineffective” (Belcher and Schreckenberger 2007). In response to this fragility of international markets, attention is shifting to local and regional markets.

2.5.2 Local Markets

Substantial but largely unquantified local markets for forest goods exist throughout the world (Wiersum and Ros-Tonen 2005; Shackleton et al. 2007, 2008). In Evans’ (1996) terms, these markets absorb both wild staples, which “are ingredients of everyday meals which are integral parts of cultural foodways or food patterns” and wild luxuries, which “are rare, valuable or otherwise prestigious items of food from the wild”. Box 2.2 describes açai, a product that represents both of these categories (Fig. 2.2). The potential public health benefits of continued consumption of a diversity of NTFPs and other wild-harvested and traditional products are increasingly apparent as urban populations undergo the nutrition transition (Johns and Shapit 2004; Johns and Maundu 2006). From the producer perspective, the absorptive capacity and prices paid in these markets are typically lower than in international markets, but barriers to entry, costs, and the risk of “boom–bust” are also lower, partly due to the cultural significance and familiarity of NTFPs. However, as Shanley et al. (2002) point out, even these markets can be very difficult for some rural producers to access.

During the last two decades, case studies have yielded insights regarding the conditions under which commercialisation of NTFPs is most likely to be

successful. Lack of resource access, market information and basic infrastructure, as well as weak political representation often hinder small producers seeking to market forest goods. Viable trade is more likely under conditions including adaptable resource management practices; transparency along the value chain; organisation among producers; and inclusion of women, although key entrepreneurs also

Box 2.2 Açaí: Fruit of the Poor Becomes Fruit of the Prosperous

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Açaí fruit (*Euterpe oleracea*) has been harvested from the Amazon forest and consumed for subsistence since the pre-colonial era. Throughout the colonial era, *caboclo* populations (miscegenation of Indigenous, African, and Portuguese peoples) continued to harvest and consume açaí as a subsistence crop, utilising indigenous management techniques in its production. However, accounts from the nineteenth century naturalists exploring Amazonia reveal that açaí was not consumed by urban European elites, was considered a food for the poor lower classes, and thus was not managed for commercial purposes (Bates 1863; Wallace 1853).

When riverine *caboclo* families began establishing urban residences in large numbers in the 1960s, they brought and maintained their habits and cultural preference for açaí fruit, creating a demand which has continued to grow strongly over the past 30 years. In addition to cultural continuity, açaí fruit has provided affordable nourishment and a caloric staple particularly important to low-income urban residents.

In recent years, as açaí became more widely available in urban stalls and restaurants, it came onto the radar of food companies, which saw its potential as an energy and health drink in national and international markets, where products deemed both socially and environmentally responsible, have become fashionable, and can command astounding prices. For instance, the value of açaí fruit pulp resulting from the harvest of 1 ha of managed forest at the farmer's gate (i.e., fruit in nature) ranges from around USD 1000 to USD 1200. The price for the same amount (in equivalent processed pulp) increases 20- to 50-fold (depending on the end product) by the time it reaches consumers in southern Brazil and 70-fold or more (depending on the end product) for international consumers (Brondizio 2008). For instance, pills and vitamin supplements claiming health and anti-aging benefits of açaí cost USD 50 per container.

Commercial companies and the government, both new to the açaí business, perpetuate the idea that they direct the management and intensification of açaí that is carried out by *caboclos* in native forests. In reality, the production systems being developed by industries are built upon the traditional knowledge and generations of management practice of riverine *caboclos*, such as the
(continued)

agronomically sophisticated “Roçados de Varzea” (floodplain gardens). The management efforts of caboclos over the past three decades deserve the credit for açaí production reaching its impressive current levels.

This story of the estuarine caboclos’ initiative, utilising traditional ecological knowledge, is an excellent example of the potential to reconcile conservation and development goals through commercialisation of an NTFP. However, producers continue to be depicted as mere suppliers of raw material and thus suffer from the stigma of extractivism and the invisibility of their sophisticated forest management systems (Brondizio and Siqueira 1997). Although producers have benefitted from market expansion, they have been unable to participate in new sectors of the economy associated with the commercialisation of fruit stock, its transformation, and its value aggregation along the chain. The increasing demand for açaí has resulted in growing competition for production areas from corporations seeking to control supply. Current trends indicate that açaí may become sourced less from native forests directed and managed by caboclos, and more from industry-dominated monocultural systems (Brondizio 2008).



Fig. 2.2 Harvesting açaí (*Euterpe oleracea*) near Belém in the eastern Brazilian Amazon (photo: Marcos R. Tito)

often play a vital role (Schreckenberget al. 2006; te Velde et al. 2006). In eight South and Southeast Asian countries, lessons learned from scores of decade-long, on-the-ground projects include the need for realistic, long-term time frames; continuity of commitment; hard work; and mutual respect. “Effective marketing of forest goods and sustainable livelihood development is a long and tedious process, requiring a step by step approach” (Arquiza 2008).

Recent literature also sheds light on the role of NTFP production and trade in urban livelihoods. Both the optimists and the pessimists saw traditional traders as barriers to commercialisation projects that sought to improve livelihoods and promote forest conservation. However, traders clearly play essential roles and take on significant risks in NTFP markets, and in many cases, they are themselves an important category of relatively poor people who make their livelihoods from NTFPs (Ndoye et al. 1998; Shackleton and Shackleton 2004; Ingram 2009). In the Amazon in particular, recent literature points to the growing importance of peri-urban populations, often recently migrated from the interior, in the harvest and distribution systems for NTFPs (Stoian 2005; Padoch et al. 2008; Parry et al. 2010). While there is consensus that collection of NTFPs by urban and peri-urban residents is a growing phenomenon, the implications of this for conservation and forest management are still debated.

2.5.3 *Diversity*

While specific marketable NTFPs offer a means to earn cash income and continue cultural traditions, the great diversity of NTFPs, in and of itself, is increasingly recognised for its contribution to rural livelihoods. The value of this diversity manifests itself as natural insurance, smoothing of labour demand and incomes, a well-stocked and affordable natural pharmacy, and a diversified and nutritious diet (especially for children), all from a source unlikely to be captured and monopolised by elites.

The safety net or “natural insurance” function of forests in developing countries has been widely noted (Neumann and Hirsch 2000; Pattanayak and Sills 2001; Shackleton and Shackleton 2004; Marshall et al. 2006). Any single NTFP can be subject to supply or demand swings, just as with any other component of rural livelihoods. But NTFPs as a group can serve as a more secure fall-back option because of the diversity of species and plant parts that can be collected for consumption or sale throughout the year. While this potential role of NTFPs is now well accepted in the literature, its strength and applicability in different settings is poorly understood (Paumgarten 2005). Research has identified the type of shock (Takasaki et al. 2004), the available alternatives (Fu et al. 2009), human capital (Fisher et al. 2010), and forest policy (McSweeney 2005) as influencing household reliance on NTFPs as a safety net.

Two other ways in which the diversity of forest products contributes to rural well-being are by supporting health care and nutrition (Fig. 2.3). Many people living on

Fig. 2.3 Wide variety of medicinal plants for sale in the Brazilian Amazon (photo: Marcos R. Tito)



forest margins neither have access to nor can afford to patronise well-stocked modern pharmacies, but use modern medicines for only some ailments and rely on the natural pharmacy of medicinal plants for others (Shanley and Luz 2003; Colfer et al. 2006). It is the diversity of plants freely available that makes this so valuable to local people. Likewise, the diversity of wild foods found in forests can greatly improve the nutritional quality of diets, perhaps particularly for children who snack on fruits, nuts, insects, and other wild foods on their way to school and chores (McGarry and Shackleton 2009). Evans (1996) argues that, “children especially have difficulty in eating enough food to satisfy total calorie requirements unless there is some liquid sauce or stew to accompany these carbohydrate staples. The variety of colour, smell and texture that intrinsically wild food can provide is wide and its role in providing essential vitamins, minerals, trace-elements, proteins and fats is supported by both biochemical analysis and anthropological fieldwork”. Many authors have called for more careful study of macro- and micronutrient dense wild species in order to add them to nutrient databases and incorporate them into nutrition policies (e.g., Grivetti and Ogle 2000; Johns and Eyzaguirre 2006).

The array of nutritional contributions and culinary diversity which NTFPs offer is also gaining recognition and appreciation in the developed world. For example, in North America and Europe, advocates for the consumption of locally harvested

Fig. 2.4 Processed NTFPs for sale in Canada: wild lingonberry jam (photo: Sheona Shackleton)



food (i.e., community supported agricultural systems, Slow Food, macrobiotic diets and farmers' markets) are introducing diverse agricultural and forest products to local diets and economies (Fig. 2.4). There is growing concern that diets are dominated by a negligible number of foodstuffs, limited in micronutrients, trace elements, and overall nutritional value. In this context, the wide-ranging dietary value of wild fruits, forest greens, game meat, nuts, and fungi is gaining renewed cultural, culinary, and socioeconomic appreciation (Emery and Pierce 2005; Emery et al. 2006).

2.5.4 *Managed Forest*

Pure extractivism and monoculture are now recognised as just the extreme end-points of an entire gradient of management for NTFPs in forested landscapes that are cultural products, the result of centuries of manipulation and management (Dove et al. 2005; Pretty et al. 2009, Chap. 7). Certainly, some well-known products such as tea and rubber in Indonesia, guarana (*Paullinia cupana*) and cashew in Brazil, and coffee and African plum (*Dacryodes edulis*) from Central Africa have transitioned from extraction to monoculture. However, local people also manage existing forests (e.g., through enrichment plantings) and cultivate new forests in a "hortus" model that replicates forest patterns and retains the complexity of the natural ecosystem (Michon 2005). This maintains the valuable diversity of NTFPs and incorporates their production into social networks that regulate access and control (Ros-Tonen and Wiersum 2005). In CIFOR's comparative assessment of 61 cases of commercial NTFPs, many of the best income-earning opportunities were based on intermediate levels of management (Ruiz Perez et al. 2004).

Examples of products which are managed within forest and agro-forest ecosystems include rattan in Kalimantan (de Jong et al. 2003), açai in Brazil (Box 2.2), and maple sugaring in North America (Hinrichs 1998).

Most NTFPs only gradually and partially transition from extractivism to domestication. Especially in cases where land tenure is clear, demand can catalyse innovation among farmers that favours sustainable practices. For example, diversified forest gardens hosting fruits, latex-producing trees, and rattan are central features of communities and help define territories and land claims in Indonesia (de Jong et al. 2003). In case studies from Mexico and Bolivia, small-scale domestication was widespread, occurring in 35% of the communities facing resource depletion, and only 11% of the cases had no signs of resource management plans or domestication in place (Schreckenberget al. 2006). Research in South Africa finds that in the initial phases of domestication, farmers draw on the broad genetic base available in the wild, resulting in improved germplasm (Leaky et al. 2004) and trees with higher yields, fruit size, and desired fruit traits (Shackleton et al. 2003).

Based on mounting evidence of traditional, successful but often invisible management for NTFPs, researchers have called for a) treating diversified forest cultivation and management as an alternative rather than just a transition towards more modern or intensive production systems (Wiersum 2003; Michon 2005); b) a participatory approach to research on NTFP management and domestication that could enhance its role in smallholder livelihood systems (Akinnifesi et al. 2008); c) greater recognition of the value of secondary forest, fallows, and other managed ecosystems (Ambrose-Oji 2003); and d) a rethinking the dichotomy between timber and non-timber products (Padoch and Pinedo-Vasquez 1996) (Chap. 8).

As Michon (2005) argues, “dissociating timber from NTFP in scientific forest research, in international discussions on forest management and in development projects indirectly contributes to reinforce policies that deprive local communities from the large benefits of timber management”. In the past decade, research has increasingly focused on the potential and trade-offs involved in managing or harvesting both timber and non-timber products from forests (Shanley and Rosa 2004; Herrero-Jáuregui et al. 2009; Menton et al. 2009; Chap. 8). Thus, the wild harvested and internationally marketed NTFPs that generated so much excitement at the beginning of the 1990s have now been placed back in the context of a range of forest products (from medicinal plants to timber), a range of forest management intensities (from pure extraction to intensive forest management), and a range of markets (from international to local).

2.6 Conclusion

NTFPs have become firmly established in the academic research domain, with the Web of Science reporting 50–75 new publications on this topic every year since 2003. Current research considers the full range of livelihood functions provided by NTFPs. This book reflects much of the recent thinking on the “middle ground” of

NTFPs, giving due consideration to the role of culture and tradition, local and regional markets, the way the livelihoods are supported by the sheer diversity of NTFPs, and the forest management practices of local people.

NTFPs have also earned a place in international forest policy discussions, e.g., as a recognised subtheme in the 13th World Forestry Congress in Buenos Aires in 2009. However, policy, donor funding, and implementation projects are often one step behind research (Chap. 11). In the case of NTFPs, this means a continued focus on commercialisation, sometimes discussed as a viable win–win for sustainable development, and other times disparaged as a pipe dream that has misdirected efforts and resources. It is crucial that the policy discussions catch up with current research, for example, understanding the conditions under which forests function as safety nets that prevent the poorest from falling deeper into poverty in the face of shocks such as those expected from climate change. Indeed, the diverse roles of forests in local livelihoods, and correspondingly diverse ways in which local people manage the forests, will be important for adapting to climate change, and therefore should be central considerations in plans to mitigate climate change through forest conservation and management.

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