

Overview of the case studies and their diversity

Pablo Pacheco, Pia Katila, Gerardo Mery, and Glenn Galloway

2.1 Forests and livelihoods

Forest goods and services play an important role in the livelihoods of people living in or around forests and also contribute to broader economic development. However, there are important differences in the way in which forest goods and services contribute to local people's livelihoods: either by supplying subsistence goods or contributing to the income streams of smallholders and communities or by providing job opportunities and income to workers engaged along the value chain of timber and non-timber forest products (NTFPs). Services provided by forests, such as provision of clean water, are crucial for human well-being, and in some cases, they can also generate income to families that depend on activities such as ecotourism. This diversity is clearly reflected in the case studies (Part II). This chapter explores the different ways through which forests contribute to local livelihoods and the degree that smallholders and communities depend on forests resources for livelihood strategies, either for subsistence or cash income. The degree of dependency is to a large extent related to the access to and availability of forest resources to local populations, the role that forests play as part of broader livelihood strategies, and the development of large-scale forest-based industry that contributes to the generation of jobs and income at the local level as well as nationally, thus supporting broader economic development. The relationship between local livelihoods and broader national economies and forests is naturally shaped by the extent and condition of forest resources and the development of the forest products sector.

2.1.1 Forest contribution to local communities living in or around forests

A significant number of forest dwellers, particularly those living in tropical forest zones in the Amazon where important tracts of forests remain, tend to

depend to an important degree on forests to satisfy subsistence needs for food, timber for construction, and energy as well as to obtain cash income to cover other social needs, mainly education. For example, in Acre [1] and northern Bolivia [5], smallholders and communities depend on cash income from the extraction and commercialisation of NTFPs such as rubber and Brazil nuts, which contribute in an important way to the local economies, although logging increasingly plays an important role in local people's incomes. To some extent, maintaining these forest-related sources of income has required important interventions by the state and private sector in order to build the value chains that link local producers with markets. Also, in the cases described in Cambodia [11], Thailand [17], Bolivia and Peru [8], and Madagascar [20], communities living in or near forests tend to depend in important ways on a wide variety of NTFPs and timber. In the cases from Cambodia and Thailand, however, forests are part of relatively complex livelihood strategies related to quite diverse production systems that combine slash-and-burn agriculture with agroforestry practices and timber extraction.

In a different context, in countries with more developed economies, some indigenous people still tend to depend strongly on forests, which is often linked to cultural ties to the forests. This is the case in Canada [9], Finland [24], and the US Pacific Northwest (PNW) [10]. In Finland, forests have a major role in economics and local culture both historically and today, especially for traditional groups in northern Finland since forests are important for reindeer-herding. In Canada, many of the rural and remote communities rely heavily on forests for jobs and economic stability, and indigenous people still look to the forests for their livelihoods and their cultural and spiritual sustenance. In the US PNW, several tribes have treaty rights to fishing and hunting in national forests as well as rights to have sacred sites protected, and although the importance of forests in local livelihoods has decreased, it has increased in other forest-related uses, such as regulating water production.

2.1.2 Forest contribution to people with more diversified livelihoods

In locations where complex mosaics of forests and agricultural lands predominate, people tend to depend on more diversified livelihoods for subsistence and cash income. These livelihoods depend on forest resources, including timber and a diversity of NTFPs and also production derived from agroforestry systems and agricultural crops. In these cases, however, several situations tend to emerge. In some cases, forests maintain an important contribution to livelihood strategies, mainly as a safety net, such as in Nepal [16] and Thailand [17], where communities extract a large number of NTFPs in relatively small amounts (e.g. fruits, resins, fodder). In other cases, the contribution of forests tend to decrease over time in the face of expanding cattle ranching and/or agricultural production, often driven by the adoption of commercial crops. For example in the transamazon area in Brazil [4], smallholders tend to invest in cattle-breeding.

In some contexts, such as in the cases from Colombia [8], Thailand [17], Ethiopia [18], and Uganda [22], farmers still depend heavily on agroforestry systems on small landholdings for subsistence and cash income. Due to the more intense intervention on the landscapes, most forests are secondary forests, located on private lands or state-owned lands under customary use. Cultivation and harvesting of trees has a long history, and the income from planted trees constitutes an important source of revenue. An important process of forest conversion and dependence of smallholders' livelihoods on monocrops, with resultant higher vulnerability due to price oscillations, can follow when crop trees, such as oil palm in Indonesia, tend to reach a comparatively higher profit than other tree species.

2.1.3 Contribution to income through the provision of forest-related services

A few cases analysed in this volume suggest that though the contribution of forest goods as part of broader livelihood portfolios is declining, incomes originating from the provision of forest services tend to play an increasingly important role. For example, in the case in Finland [24], nature-based tourism has become an important economic activity. In Italy [27], there is a growing trend linked to the establishment of cooperatives aimed at the commercialisation of forest-based services (e.g. tourism, trekking, fishing) that contribute in significant ways to employment generation.

In some cases, the latter trend is related to conservation initiatives such as the one undertaken in the

US PNW [10]. The PNW was a major producer of wood in the United States until the late 1980s, when the relative and absolute importance decreased significantly, though it is still an important sector. Many communities that were highly dependent on federal timber harvest for their well-being have still not recovered from this decline. In this context, drinking water for all of the major cities in Oregon originates on national forestlands, which are also important for species conservation and contribute significantly to recreation and tourism economies.

2.1.4 Forests, large-scale industrial production, and livelihoods

Forests contribute in varying degrees to national economic development, mainly through the large-scale timber industry and, in a few cases, industries based on NTFPs. In the countries of the case studies analysed, industrial forestry is important in Brazil, Indonesia, Mozambique, Canada, the United States, Finland, Bosnia and Herzegovina (BIH)⁽²⁾, South Africa, and China. For example, in the case study from China [12], companies contribute to local economies through employment, technology transfer, and employee training and capacity-building. In Brazil, particularly in the states of Para and Acre [3], timber companies have been relatively active in partnering with smallholders and communities through different contractual arrangements in order to carry out logging operations that provide direct sources of income for local populations. In BIH [23], forest-based industry provides jobs and income and contributes significantly to livelihoods at the local level: more than 16 000 people (3.7% of total number of employed) work in forestry and the wood-processing industry. In northern Bolivia [5], the industry linked to Brazil nut extraction constitutes the main economic activity in this region, employing for about four months a year a significant number of people living not only in rural communities but primarily in the cities to collect Brazil nuts in the forests.

Local populations living in or close to forests are directly or indirectly affected by forestry operations. It is thus assumed that if timber companies with access to public forests or carrying out forestry operations in these forests improve their management practices, it will have positive implications on local populations. In this regard, the Indonesian case [15] suggests that while national-level legal frameworks generally disrespect local communities, the adop-

⁽²⁾ The Federation of Bosnia and Herzegovina (FBiH) is one of three units within the country of Bosnia and Herzegovina (BIH)

tion of certification by some timber companies has encouraged greater recognition of the right of local communities to meet their livelihood needs. However, the interactions between companies and local communities are problematic due to conflicts over forest access and the inability of concessionaires to restrict access of local populations to these areas, which often are also attractive for farming.

2.2 Main drivers of change in forest extent and condition

In 2010 forests were estimated to cover 31% of the world's land area. While deforestation is decreasing in some parts of the world, it is still a serious problem in many regions; every year close to 13 million ha of forestland is permanently converted to other uses (FAO 2010). Deforestation and degradation especially continue in tropical regions (FAO 2010).

Natural expansion of forests and afforestation are significant in some regions of the world (particularly in Asia, Europe, and North America), reducing the net loss of forest area to 5.2 million ha per year at the global level. The planted forest area increased by 5 million ha per year between 2000 and 2010, making up about 7% of the total forest area today. The vast majority of planted forests are located in Asia. For more information about forest cover and deforestation, see chapters 2 and 3 of Part IV.

As the following discussion shows, parallel but opposite trends in forest condition and extent are evident in many countries. Forest degradation and deforestation are ongoing in some areas while, at the same time, forest extent and condition are improving in others.

Deforestation is reported in the case studies from Argentina [2], the Brazilian Amazon [1,4], Bolivia [5], Guatemala [6], Cambodia [11], Indonesia [14,15], India [13], Nepal [16], Thailand [17], Ethiopia [18], Madagascar [20], The Gambia [19], Mozambique [21], and Uganda [22]. In general, deforestation and forest degradation are related to unsustainable practices, natural disturbances, and climate change. Wildfires contribute to forest degradation in Canada [9], US PNW [10], Indonesia [14,15], The Gambia [19], and BIH [23] and pests in Canada and US PNW.

The expansion of the agricultural frontier is an important anthropogenic driver of deforestation in many case studies (Brazilian Amazon [4], Argentina [2], Bolivia [5], Guatemala [6], Cambodia [11], India [13], Indonesia [14,15], Thailand [17], Ethiopia [18], The Gambia [19], Madagascar [20], Mozambique [21], Uganda [22]). In some cases, for example in Madagascar, traditional slash-and-burn cultivation contributes to deforestation. In many countries the

expansion of commercial large-scale agricultural production for crops such as soya, palm oil, sugar cane, rubber, and grains leads to forest clearing (e.g. Indonesia, Cambodia, Uganda). Cattle-raising contributes to deforestation especially in South America (e.g. Brazil, Argentina).

Fuelwood gathering and charcoal production are reported as drivers of forest degradation and deforestation in Cambodia [11], India [13], Ethiopia [18], The Gambia [19], Mozambique [21], Uganda [22], and Madagascar [20]. Infrastructure expansion is also causing deforestation in several case study regions such as Acre [1], the Amazon [3], Guatemala [6], Mexico [7], US PNW [10], Thailand [17], and Mozambique [21].

Unsustainable and illegal logging contribute to forest degradation and indirectly to deforestation because logged forests are often easier to access and clear for cultivation. Logging roads also open new areas for people in search of new land. Commercial logging is reported to contribute to degradation in the case studies from Bolivia [5], Cambodia [11], Indonesia [14,15], Thailand [17], Mozambique [21], and Uganda [22].

Inadequate law enforcement and corruption have prejudiced wider introduction and implementation of SFM and subsequently caused increased forest degradation, for example in Cambodia [11], The Gambia [19], Mozambique [21], and central Uganda [22].

Positive changes in the extent and condition of forests are linked to the implementation of specific forest programmes such as forest rehabilitation in Ethiopia [18] and afforestation projects in China [12]; enactment of forest laws and implementation of forest protection activities (Acre [1], Mexico [7], Guatemala [6], US PNW [10], Uganda [22], South Africa [27]); local cultural values, and traditions that support sustainable use of forests as in Quintana Roo, Mexico [7], and Urbi6n, Spain [25]; certification (Indonesia [15]); and forest protection activities, which allow the natural regeneration in forest areas (Acre [1], Guatemala [6], US PNW [10], Uganda [22], South Africa [27]). The case studies from Mexico [7], Guatemala [8], and India [13] also show how CF efforts have preserved the extent of forest resources and prevented additional degradation.

In many of the cases study countries, industrial forestry is important and is based on natural forests (e.g. Canada [9], Mozambique [21], BIH [23]) or intensively managed natural forests (Finland [24]), while plantations are important in Indonesia [14,15], China [12], and US PNW [10]. In some cases, there has been a change from natural forests to plantations, as in the US PNW, where industrial forestry has moved from utilising old-growth forests on federal lands to plantations on private land. Industrial enterprises in Indonesia conduct business in both natural forests and plantations. In Mozambique [21],



Figure III 2.1 Intercropping of bananas and oil palm by small holders. ©Marko Katila

industrial forest plantations are being established and could become dominant in the future. In South Africa [27], industrial forestry plantations are the drivers of forest industry and without them, exploitation of natural forests would be much higher and wood imports much greater.

2.3 Agroforestry and trees outside forests

Since most case studies in Part II focus on regions where considerable forest cover still exists and SFM generally focuses on managing and conserving natural forests, less emphasis has been placed on trees outside forests in this volume, with some notable exceptions. The case studies from Argentina [2], Mexico [7], India [13], Thailand [17], Ethiopia [18], Mozambique [21], Uganda [22], and South Africa [27] stress the importance of trees outside forests for local uses such as fuelwood, poles, fruit production, apiculture, shade, boundary demarcation, and in a small number of cases, as components of silvopastoral systems. In Cambodia [11], trees are integrated into traditional agroforestry practices, though generally without systematic management in relation to other farm components. In Ethiopia, small woodlots of primarily *Eucalyptus* spp. serve as a source of wood in a landscape that has been subjected to widespread deforestation. In northern Ethiopia and in Thailand, multipurpose trees play major ecological and socio-economic roles. In Madagascar [20], trees outside forests, notably the breadfruit tree

and cashew and fruit tree plantations, are important production systems. In Uganda, tree cover in home gardens for multiple purposes, including shade and boundary demarcation, is increasing. Clearly, trees outside forests often form part of local livelihood strategies (Figure III 2.1).

In Quintana Roo, Mexico [7] and Acre, Barzil [1], efforts are being made to establish and manage tree species outside forests that traditionally have been harvested or have produced NTFPs within natural forests. For example, in Quintana Roo, some farmers are planting Spanish cedar and mahogany in agricultural fields in order to augment timber production of these highly valued species; natural regeneration and recruitment of these species into higher diameter classes has been problematic in selectively logged forests (Snook and Negreros-Castillo 2004). In the case of Acre, agroforestry systems have been promoted by local and national NGOs and the state government's extension agency.

As indicated in the Acre [1] and Quintana Roo [7] case studies, the establishment of forests species outside of forests to augment and make the production of desired products more efficient is important and will most likely increase in the future. Even in areas with considerable forest resources, a compelling case can often be made to establish invaluable species outside the forests where conditions favouring tree growth (rate and uniformity) can be fostered.

As forests are valued more for the environmental services they provide, the production of products derived from trees may shift to areas outside the forest to reduce impacts caused by harvesting operations in the forest.