



Community forest management in the Peruvian Amazon

A literature review

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Photo by Juan Carlos Izurieta
'Tablilla' saw mill near Pucallpa, Peru.

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1 Introduction

For a long time, the predominant focus of international interest in tropical forests was on forest preservation and biodiversity conservation. Recent years, however, have seen a gradual shift away from this “fortress conservation” (Brockington 2002) toward sustainable forest management, in which local people’s needs are reconciled with biodiversity conservation (Schwartzman et al. 2000; Wilhusen et al. 2002). In the 1990s, integrated conservation and development projects (ICDPs) became common (Hughes and Flintan 2001), including projects that supported community-based sustainable management of forests for environmental services, timber and non-timber forest products (NTFPs). These community forest management (CFM) projects were designed as an alternative to traditional timber extraction practices, with the aim of protecting forests while providing social and economic benefits to a range of forest users (Bray 2004). CFM is generally understood to refer to a wide variety of local modalities employed to manage and use forest resources in a sustainable and equitable manner (De Camino 2001; SNV 2005; Pagdee et al. 2006; Cronkleton et al. 2013). Most of the discourse around CFM centers on management of communal forest resources (Agrawal and Ostrom 2001; Pagdee et al. 2006) or on externally supported projects that facilitate timber harvesting or NTFP commercialization (Amaral et al. 2005; Li 2007). This focus on communal forests is logical, given that large areas of forest in Latin America are managed by communities under communal titles. At the same time, other forms of forest management are increasingly attracting attention and interest, particularly company–community partnerships (Mayers and Vermuelen 2002) and locally initiated forest management activities that do not rely on outside support (Pokorny et al. 2010).

CFM projects usually focus on supporting collective enterprises that manage communal forests under legal management plans, yet in practice, communities and the individual households within them manage forests in diverse ways. We therefore argue here that the definition of CFM should be expanded to include the variety of ways in which communities manage their forests, whether through externally supported projects or informal traditional forest management practices. Under this definition, CFM is understood to comprise all planned forest activities conducted by local actors, such as indigenous, peasant or

traditional communities, colonist settlers, *riberños*¹ or small-scale farmers (Sabogal et al. 2008).

A substantial body of evidence shows that CFM has become an important feature of the forestry sector in many developing countries. Many early examples come from India and Nepal (e.g. Agrawal and Ostrom 2001), with examples from Latin America increasingly common (Larson et al. 2008; Cronkleton et al. 2011a). Leaders in Latin America include Mexico (Klooster and Masera 2000; Bray et al. 2003, 2005), Guatemala (Ortiz 2000; Wittman and Geisler 2005; Taylor 2010), Brazil (Amaral et al. 2005; Humphries and Kainer 2006) and Bolivia (McDaniel 2003; de Jong et al. 2006; Stearman 2006). Although in Mexico CFM has been evolving over several decades, in other countries in Latin America (particularly in the Amazon region), most initiatives to promote CFM are relatively recent (Amaral et al. 2005; SNV 2005). This is the case for CFM in Peru.

The purpose of this review is to summarize the published literature, as well as any available information provided by NGOs or project proponents, on the practice of CFM in the Peruvian Amazon. We begin by describing the forestry sector in Peru to provide background for the discussion of CFM. This is followed by an overview of land-use and forest management by rural populations in the Peruvian Amazon. We then describe the different manifestations of CFM in Peru and the most widely studied cases of CFM projects. Finally, we look at some emerging initiatives, summarize the main challenges for CFM and highlight important areas for future research.

2 Peru’s forestry sector

Peru has the second largest area of natural forest in South America, and the ninth largest in the world (Schwartz 2004), and Peru’s forests are among the

¹ A term used for rural populations in the lowland Peruvian Amazon. They include detribalized Amazonian natives, immigrants from neighboring Peruvian departments, from other South American countries or overseas, or the descendants of any unions between members of these groups. They live mostly along the major rivers in small villages called *caserios* (De Jong 2001).

Earth's most significant areas of biodiversity and endemism (Oliveira et al. 2007). The forests of the Peruvian Amazon cover a total of 73 million ha, or 60% of the country's total land area (MINAM and MINAG 2011). A total of 78% of the Peruvian Amazon (47% of the country) lies in four administrative regions (Loreto, Ucayali, Madre de Dios and San Martín) (MINAM 2009). Almost 8% of Peru's population lives in these regions, where poverty is high (SNV 2005).

The government classifies forests in Peru (Table 1) as production forests (for timber and NTFPs), protected forests (e.g. parks and reserves) and community forests (see Box 1).

Under Peruvian law, people may extract timber and NTFPs from forests, but they may not convert land designated as forest to agriculture. However, in practice, these classifications have had little influence over land-use behavior in the Peruvian Amazon (Che Piu and Menton 2013). In recent decades, deforestation in Peru has persisted. Peruvian scientists estimate that an average of 149,632 ha of forests was lost each year between 1990 and 2000, mainly through conversion to agriculture (MINAM 2009). After peaking at 163,000 ha a year in 2000–2005, average deforestation declined to 123,000 ha each

year from 2005 to 2009 and to 103,380 ha each year in 2010 and 2011 (MINAM 2012). Although this level of deforestation is lower than the global average or that of neighboring Brazil (250,000 ha/year) (Hansen et al. 2013), it is projected to continue at similar rates until 2050 under a business-as-usual scenario (Armas et al. 2009). As deforestation in the Peruvian Amazon has many causes and follows irregular patterns (Alvarez and Naughton-Treves 2003; Chavez 2009; Dourojeanni et al. 2009; MINAM 2009; Almeyda Zambrano et al. 2010), efforts to reduce deforestation in the country have followed a range of trajectories, from support for CFM (Gaviria and Sabogal 2013) and payments for forest ecosystem services (Armas et al. 2009) through to more recent interest in REDD+ (Reducing Emissions from Deforestation and forest Degradation) (Che Piu and Menton 2013).

2.1 Timber production

Timber production is a major economic activity in the Amazon and an important source of regional employment (Chirinos and Ruíz Pérez 2003). Historically, the forestry sector in the Peruvian Amazon relied predominantly on timber harvested on a small scale by native communities and other rural populations. Over time, however, timber harvests became more intensive and were organized by industry, although they remained at a relatively low intensity, given the volume potentially available in Amazonian forests. Only in recent decades have large enterprises begun the aggressive extraction of commercial timber species using machinery (Malleux 2008).

Since the 1920s, Peru's timber sector has concentrated on the selective logging of high-value hardwoods, initially mahogany (*Swietenia macrophylla*) and cedar (*Cedrela odorata*), and then later other species such as tornillo (*Cedrelinga catenaeformis*). The government granted one- or two-year contracts on areas of up to 1000 ha without management plans in an attempt to facilitate access for small-scale loggers (Cossío 2009). However, these contracts were often held by larger logging companies instead, and the lack of government oversight and control led to overexploitation of these species. During this time, although these contracts sometimes covered areas that overlapped with communities' or smallholders' lands, the government did not recognize the legal rights of those smallholders or communities to harvest timber. Nonetheless, rural

Table 1. Forest classifications in Peru, with type and area.

Forest classification	Area (millions ha)
Production Forests	
Active Production Forests	9.2
Reserve Production Forests (for future harvest)	8.8
Protected Areas	
National Natural Protected Areas	16.3
Regional Protected Areas	0.7
Private Protected Areas	0.04
Community Forests	
Titled Native Communities ^a	10.6
Voluntarily Isolated Communities	1.75
<i>Campesino</i> Communities	3.53
Unclassified Forests	22.25
Total	73.17

a Titled native communities are only officially granted use rights (*cesión de uso*) to forests in their areas.

Source: MINAM and MINAG (2011)

people continued to harvest timber under their customary systems. Only in the late 1980s and 1990s did the first CFM projects emerge, with the aim of promoting legal models of forest management in these communities. At that time, logging was allowed in communal forests but communities were subject to the same regulations as companies (1975 Forest Law, No. 21147).

The legal framework introduced in 2000 has attempted to promote the sustainable use of forest resources through longer-term contracts and management plans. As a result, new forest areas and timber species were incorporated into existing management regimes and, by 2009, forest enterprises in the Amazon were harvesting an average of 14 timber species in their concessions. Most of these concessions were held by medium to large enterprises rather than by small-scale loggers (Cossío 2009).

Despite the abundance of forest resources and the prevalence of extractive activities throughout the Amazon, the forestry sector contributes only 1% of Peru's GDP (Chirinos and Ruíz Pérez 2003; Schwartz 2004). Because of this small contribution, the sector has limited influence on national economic policies, which creates challenges for the sector (SNV 2005). However, the sector is growing: the value of sawn timber exports increased from USD 52.5 million in 2000 (INRENA 2001) to USD 110.6 million in 2007 (INRENA 2008). In 2006, the United States was the main market for sawn timber exports from Peru (52% of all exports), with mahogany the most sought-after product; Mexico was the second-largest market with 31% of all exports (INRENA 2007). Although 150 timber species were harvested in Peru in 2009, the top 15 accounted for 76% of the country's total production, with a combined volume of 1.5 million m³. The highest-producing regions were Loreto (26.4%), Ucayali (21.8%) and Madre de Dios (14.2%) (DGFFS 2010).

Yet the figure of 1% of GDP represents the official contribution only: the actual role of the forestry sector in the national economy may be much greater, given the high rates of illegal logging and the predominance of informal markets (Sears and Pinedo-Vasquez 2011; Urrunaga et al. 2012; Putzel et al. 2013b). In addition, official economic statistics do not consider local and informal markets or the wage labor they generate, nor do they account for the subsistence value of forest products or the value of goods and services to rural and urban livelihoods (SNV 2005). Although there are no official statistics

on employment in the forestry sector, the sector is known to be an important source of employment in the region. For example, in Ucayali and Madre de Dios, logging is one of the main economic activities, giving employment to 40–65% of the economically active population (Chirinos and Ruíz Pérez 2003).

2.1.1 Forestry laws and community forest management

Specific rules apply to logging in communal forests managed by native and *campesino* communities. The current Forestry Law (Law No. 27308, passed in 2000) grants native and *campesino* communities the right to extract timber and NTFPs from their forests (Article 11) and awards them prioritization by the authorizing institutions (Article 12). A subsequent decree (D.S. No 052-2001-AG) gives particular priority to CFM in the lowland and upland Amazon. In 2006, INRENA, the National Institute for Natural Resources, an agency within the Ministry of Agriculture that was responsible for oversight of forests, approved terms of reference for designing forest management plans in native and *campesino* community forests and established a scheme that divided harvesting by native communities into three strata: low, medium and high intensity (Resolution 232-2006-INRENA). Low-intensity logging covers annual harvests of up to 650 m³ of timber and requires the community to take direct responsibility for extractive activities. Additional restrictions prohibit any involvement by third parties, the extraction of mahogany or cedar, and the use of tractors or heavy machinery. Medium-intensity logging allows harvests of up to 2500 m³ annually. This level of logging intensity can take place in community forest holdings of up to 5000 ha, which can be divided into five-year rotational units. No restrictions apply to the involvement of third parties. High-intensity logging applies to communities with forest areas totaling more than 5000 ha and is subject to the normal logging procedures for commercial enterprises (Directiva No. 017-2003-INRENA-IFFS). Volumes are flexible, but guidelines suggest a restriction of 15 m³/ha for Cusco and Amazonas, 25 m³/ha for Loreto, Ucayali, Madre de Dios and San Martín, and 30 m³/ha for Pasco and Junín. During debates on the new Forestry and Wildlife Law (Law No. 29763, passed in 2011), civil society organizations demanded the continued enforcement of the INRENA resolution (Che Piu and Menton 2013). Article 47 of the new law states that simplified terms of reference will be approved for CFM. The specific conditions of the new terms

of reference will be determined during the process of drafting the implementing regulations for the new law, which is expected to be completed in early 2014.

2.2 Illegalities in the forestry sector

Despite formal regulations, unsustainable and illegal logging is widespread in Peru's forestry sector (SNV 2005; Urrunaga et al. 2012) and informal arrangements are dominant along the value chain (Smith et al. 2006; Sears and Pinedo-Vasquez 2011). About 80% of logging is illegal, although some estimates put it as high as 95% (Cerdán Rojas 2007). However, the literature on the subject is limited, and mainly includes case studies dealing with protected areas or reserves (see, for example, Chirif 2002 and Schulte-Herbrüggen and Rossiter 2003). Timber species under the greatest pressure are those with the greatest market demand (Chirinos and Ruíz Pérez 2003), particularly mahogany, Spanish cedar and other hardwoods (e.g. *Dipteryx odorata*, *Myroxylon balsamum* and *Aspidosperma macrocarpon*) (Cerdán Rojas 2007). Timber of all origins, illegal or legal, arrives at its destination with documents that supposedly demonstrate its legal origin. For instance, timber illegally extracted from protected areas (or territorial reserves for indigenous peoples in voluntary isolation) is laundered through the use of documents obtained from concession contracts or from native communities' permits, which give the timber the appearance of legality (Shoobridge et al. 2004; Urrunaga et al. 2012). In other cases, a concession uses its own transportation permit to "validate" timber that it has illegally harvested from, say, a neighboring protected area. Corruption among inspectors, local police officers and government employees contributes to these practices.

Malleux (2008) pointed out that the problem of illegal activities lies not in the paperwork required to "legalize" timber but in the process of granting harvest permits. Two types of harvest permits are available: *permisos*, which are granted to indigenous and *campesino* communities or private landowners and require simplified management plans, and *concesiones*, which are granted to small to medium enterprises and require detailed management plans. According to Malleux (2008), the selection process for granting concessions is not rigorous, and many concessionaires do not have the minimum technical, economic and managerial conditions needed to guarantee efficient management of these areas. Thus, to stave off failure (i.e. bankruptcy), holders of *concesiones* often resort to illegal activities,

whether harvesting illegally themselves or selling their transportation permits to third parties. On the other hand, the less stringent requirements for *permisos* allow for easy approval of larger harvest volumes (more than *concesiones* allow). They also provide opportunities for illegal transactions, such as allowing third parties to illegally log the areas under a *permiso*. This situation has fostered such illegal practices as harvesting inflated volumes per hectare and/or including species that often do not grow in an authorized area (Urrunaga et al. 2012). This, of course, creates unfair competition for legitimate concessions that strive to comply with laws, and has perpetuated the situation that the new forestry laws were attempting to address.

Across the Peruvian Amazon, actors at all levels are involved in illegal logging, including government officials, brokers and smallholders. In many cases, smallholders are *habilitados* ("funded") by brokers to fell trees and transport the timber to one of the main ports. In the *habilito*, an informal financial system in the Peruvian Amazon, the *habilitador* (broker or intermediary) advances some money to the *habilitado* (the person doing the harvesting) for a determined volume of timber (Sears and Pinedo-Vasquez 2011). After harvesting the timber, the *habilitado* must sell all the harvested timber to the *habilitador* at the price determined by the *habilitador*, which usually is below market prices; in addition, the *habilitador* usually finds "defects" in the timber, to devalue the timber and thus force the price down (Cossío 2009). As the small-scale timber harvester does not receive the final payment until the timber is delivered to the *habilitador*, often after several months of work, they do whatever they can to avoid having the harvested timber decommissioned (Chirinos and Ruíz Pérez 2003). In some cases, indigenous people take part in illegal logging through forced labor, when they work as *peones* for timber barons in a peonage system (Bazán and Nalvarte Armas 2007). Moreover, it has been reported that logging companies use unscrupulous strategies to gain access to the resources of native communities; for example, loggers and timber firms often fabricate informal written agreements or make formal contracts with community leaders without the knowledge or consent of the whole community (Griffiths 2005). In other cases, timber firms persuade indigenous communities during their communal assemblies to allow the firms to harvest timber from their community territories, even though these same timber firms hold large concessions (40,000–50,000 ha), which they do not work in (Bazán and Nalvarte Armas 2007).

Increasingly, timber firms are offering to help native communities obtain a timber harvest permit, as a way of laundering their own illegal timber extracted from outside the permit area (Griffiths 2005). When firms harvest timber on indigenous lands, they pay the communities very low prices for the timber, discounting most of the firm's costs as "credit" extended to the community, which the communities must then repay in labor or timber (Griffiths 2005). For example, in the northern part of Alto Purus National Park, loggers established exploitative exchange relations with indigenous communities whereby the community allows the logging company to harvest mahogany trees for payment in kind with overpriced goods. Prices paid to communities are usually a fraction of the market price; for example, in this area, communities receive USD 30–60 for each mature mahogany tree — which would be worth several thousands of dollars on the international market (Shoobridge and Fagan 2005). Within the Matsé native communities in the southern portion of the Yavari River, for example, Shoobridge et al. (2004) found that loggers encourage young people to convince the elders to sell their timber. Some argue that this form of illegal logging threatens the development and economic growth of indigenous communities and other smallholders for whom forests are a major source of environmental, social and economic benefits (Rodríguez and Cubas 2010). At the same time, however, the cash income that communities derive from such activities is very important for their livelihoods and creates a powerful incentive for them to participate in the informal economy and illegal logging.

2.3 Communities, rural populations and the farm–forest interface

According to Peru's 2007 census, 3.7 million people live in the Peruvian Amazon, which is 13.4% of the national population (Dourojeanni et al. 2009). Many of these inhabitants (i.e. indigenous groups, *ribereños*, and established and recent colonists) depend either directly or indirectly on forest resources for their livelihoods, and they use a range of forest products for subsistence and commercial purposes: food, timber, materials for construction and handicrafts, and medicine (Benavides and Pariona 1995; de Jong 2001; Kvist et al. 2001; Montoya Zumaeta and Panduro Murrieta 2007; CESVI 2009; Cossío Solano et al. 2011). Despite the ancestral use of the forests by indigenous peoples and other traditional users, they have continually had to struggle for access to forests (use and ownership)

and land rights (Smith and Pinedo 2002; Sabogal et al. 2008; Espinoza Llanos and Feather 2011). Although native communities hold titles to a total of 12 million ha of land in the Peruvian Amazon (Suárez 2005), many native communities do not hold titles (Smith et al. 2003; Espinoza Llanos and Feather 2011) and many traditional forests users, such as *ribereños*, live in communal reserves but do not have legal status as "communities" (see Box 1) (Pinedo-Vasquez et al. 1990).

Forest use in the Amazon has traditionally comprised subsistence activities involving hunting, gathering, fishing and farming. However, over time, indigenous peoples and other traditional forest users (*ribereños* and colonists) have added commercial activities, such as harvesting of timber and NTFPs. Research on smallholder forest users in the Peruvian Amazon has tended to focus on their traditional shifting cultivation practices, seen as the means by which these groups sustainably managed forests. In the past, rural populations in this region had little incentive to pursue land-use strategies with higher immediate returns than those for swidden agriculture because land was relatively abundant in the Amazon, they rarely had secure tenure over land and resources, and markets for NTFPs were unreliable (Pinedo-Vasquez et al. 1992). This led researchers to recognize the ecological and subsistence benefits of traditional practices, and during the 1980s, they drew on these practices to describe the traditional ways of life and knowledge embodied in Amazonian peasant livelihood activities (Coomes 1996). In particular, considerable research has examined the traditional use and conservation of Amazonian floodplains (Denevan and Padoch 1987; de Jong 1997; Padoch et al. 1999; Kvist and Nebel 2001; Kvist et al. 2001).

In remote regions of the Amazon, most colonists, *ribereños* and indigenous peoples engage predominantly in shifting cultivation, with relatively little development of cattle ranching (Hiraoka 1986, 1989; Schjellerup 2000). Yet, as Bedoya (1995) pointed out, the intensity of smallholder agriculture varies significantly within groups. Households nearer to markets tend to include cash crops and commercial NTFPs in their livelihood strategies; examples of these are Tamshiyacu *ribereños* (Hiraoka 1986; Padoch 1992; Coomes 1996) and colonists (Cossío 2001). By contrast, more remote households engage primarily in subsistence agriculture and subsistence use of NTFPs; these include the Bora (Padoch and de Jong 1995) and Yanesha (Staver 1989; Cossío 2001) indigenous groups.

Box 1. Definitions of “community” in Peru.

Comunidad and community

In the context of Peru, the term “community” has a different definition to the common one of “a group of people living in the same area,” as appears in the Merriam-Webster Dictionary. Rather, “*comunidad*” refers to two legal constructs, namely “native communities” and “*campesino* communities.” Indigenous peoples living in recognized indigenous territories in the Amazon are legally defined as “native communities”¹ under the premise that their resource management involves collective rights and governance influenced by communal/traditional rules and practices. “*Campesino* communities” are peasant communities predominantly located on the coast and in the highlands, with collective use rights. *Ribereño* communities are the main type of community in the Amazon that falls into the category of “*campesino* community” (SPDA 2009) although many *ribereño* communities do not have legal recognition. There are 7172 legally recognized communities: 5818 are “*campesino*” communities located mostly on the coast and in the highlands, and the other 1354 are “native” communities (SNV 2005).

Caseríos and centros poblados

Colloquially, the term *caserío* is used to denote communities of mixed descent or colonists in the Amazon, even though some such communities may not be legally recognized as such. Although these groups would typically be called communities outside of the Peruvian context, they are not classified as “communities” according to Peruvian law and do not have any collective land rights. Instead, they take the label of *centro poblado*, a “populated center,” which is any rural or urban place that is identified by a name, was settled with the intention of permanence, and whose inhabitants share common interests (economic, social, cultural or historical). The residents of a *centro poblado* can collectively register with the government to be classified as a *caserío*. *Caseríos* are legally recognized settlements with 151 to 2500 inhabitants (Law No. 27795). They do not have collective land titles but are recognized as an organizational unit for the purpose of government services and planning. Residents of *caseríos* and *centros poblados* can potentially gain individual title to agricultural lands and use rights for forest concessions (timber or NTFP) but no definitive tenure over forested areas.

Colonists and other smallholders living in *caseríos* or scattered more widely across the landscape are important but poorly understood actors. The *mestizo* population in *caseríos* usually receive individual titles to agricultural land, rather than community-based land titles, but even these individual titles can be difficult to obtain. According to estimates in the 2007 national census, 1.25 million people live in *caseríos* in the Amazon region and a further 610,000 live in more scattered settlements (150 people or less in a given location) (INEI 2007).

1 Native communities “have their origin in tribal groups of the Amazon and are constituted by groups of families related by language or dialect, social and cultural characters, common and permanent tenure and usufruct rights of a common territory” (Law No. 20653, *Ley de Comunidades Nativas y de Promoción Agropecuaria de las Regiones de Selva y Ceja de Selva*) (translation by authors).

Many studies have shown that traditional shifting cultivation systems contain more biodiversity than the “modern” land-use systems included in development models in the Amazon, such as cattle ranches and industrial plantations. For example, de Jong (2001) found that *ribereños* from Yanallpa manage 78 plant species in their fields. Pinedo-Vasquez et al. (2002) reported that *ribereños* from 14 villages in Muyuy (northeast Peru) manage 76 tree species in a single hectare block. They use diverse and complex production and management techniques, as well as conservation

practices, to protect their floodplain resources and ecosystem functions. Thanks to their production and conservation practices, Muyuy *ribereños* have profited economically from agriculture, agroforestry and the extraction of forest products while conserving floodplain biodiversity.

Newing and Bodmer (2003) indicated that *ribereños* from Tamshiyacu changed their resource management regime from open access to community control, with the establishment of rules and restrictions on resource extraction, penalties for

violations and a monitoring system. This shift enabled them to maintain healthy populations of plant and animal species. However, it was by collaborating with researchers in the area, who provided expertise and information such as data on population dynamics, that community members were able to develop detailed guidelines for resource extraction and hunting restrictions.

Natural resource management differs between indigenous ethnic groups in the Peruvian Amazon depending on the suite of livelihood activities involved. For these communities, shifting cultivation is the first stage of a prolonged system of agroforestry that results in the preservation of forest structure and composition (Bedoya 1995). Nevertheless, the reason these groups engage in such “conservation activities” has frequently been the subject of debates among researchers. For instance, Moore (1985; cited by Bedoya 1995) asserted that the Amarakaeri in Madre de Dios have a rational system of natural resource management. Johnson (1989; cited by Bedoya 1995), on the other hand, suggested that the “rational non-depleting use of natural resources” seen among the Machiguenga (from the Urubamba) is a response to low population densities and not a deliberate conservationist goal. In any event, Bedoya (1995) concluded that a range of elements or factors, such as demography or markets, can be used to explain how groups use natural resources in a way that leads to the conservation (or depletion) of those resources.

For some years, the Yanasha people from Laguna-Raya (Palcazu Basin) have been managing and conserving the common resources in their floodplains (Cossío 2001). Previously, to avoid problems with open access, *comuneros* in the community were given individual plots in the floodplains to farm. Laguna-Raya families cleared the forest on these plots along the river for farming, thus degrading the land. Professional advice helped them to evaluate the problems associated with clearing floodplain vegetation and identify possible solutions. The *comuneros* set up a community General Assembly, through which they ruled that they must maintain a strip of trees along the riverbank — a decision that has largely been respected. Thus, through “social learning,” Laguna-Raya *comuneros* devised their own rules that have made farming in the floodplains sustainable.

The role of NTFPs for communities in the Amazon is another area of interest for research. A seminal paper by Peters et al. (1989) was based on the valuation of NTFPs in a 1 ha plot near Iquitos. Although

many of Peter et al.’s (1989) assumptions were later questioned (Homma 1996; Lawrence 2003), the paper opened the way for others to explore the potential for enhancing the role of NTFPs in rural livelihoods. NTFP harvesting is considered one of the most sustainable forms of forest use, as it conserves forests while also providing forest communities with important socioeconomic benefits (Nygren et al. 2006). NTFPs have enormous subsistence value to residents in the Peruvian Amazon; native fruit trees are particularly salient as an ecologically and economically viable NTFP (Penn 2008). One study of the values of different NTFPs for indigenous and colonist communities in Madre de Dios found that, although colonists exhibited a slightly stronger preference for commercial species, both groups highly valued similar species for subsistence use (Lawrence et al. 2005).

Brazil nuts (*Bertholletia excelsa*) are the most important NTFP in western Amazonia (Duchelle 2009). In Madre de Dios, which is the only region in Peru where Brazil nut trees are abundant enough for an industry to form (Melgarejo et al. 2006), Brazil nut collection is an important source of income and regional employment. It is estimated that 22% to 30% of the region’s population derives their income directly or indirectly from the Brazil nut trade, generating on average 67% of their gross annual income (approximately USD 6410 annually per harvester) (FAO 2005). Moreover, collecting Brazil nuts creates minimum disturbance of the ecosystem, and thus supports the conservation of forests (Ortiz 2002; Zuidema and Boot 2002). In the 1990s, the national government granted Brazil nut concessions, carving up the Brazil nut forests to give harvesting rights to individual households. In some cases, these concessions overlap with other allocated land uses, including mining and agriculture (Chávez et al. 2012). Most smallholders with Brazil nut concession contracts manage their forests on an individual basis; however, some have formed associations and work collectively to enhance their income and reduce their costs, and some have pursued certification, under organic standards and/or the Forest Stewardship Council (FSC) (Quaedvlieg 2009; Duchelle et al. 2013).

Palms are another important plant group in the Amazon often under community management, because they provide a range of NTFPs, including fruits, fibers and construction materials. *Aguaje*, the fruit of the *Mauritia flexuosa* palm, which often grows in swamplands, is particularly abundant in the department of Loreto, and is an important

commercial crop (Padoch 1988). The Maijuna people near Iquitos reported that outsiders had entered and begun engaging in destructive harvesting of *aguaje*, collecting as much as 3000 kg in a day (Gilmore et al. 2013). After noticing that less fruit was available for their own subsistence and commercial needs, the Maijuna restricted access to their section of the Yanayacu River (Gilmore et al. 2013). In another case, Vormisto (2002) described how the Bora in the village of Brillo Nuevo in Iquitos (northeastern Peru) use the fiber of the palm *chambira* (*Astrocaryum chambira*) to make handicrafts, such as hammocks, bags and baskets. They sell these handicrafts to tourists, handicraft stores and wholesalers in Iquitos, with sales being the main source of cash income for the villagers. However, *chambira* handicraft prices are low and income does not cover the cost of the labor needed to make them. Nevertheless, the Bora people's use of *chambira* appears sustainable, as they usually harvest the leaves without felling the palm trees, and they are aware of the maximum number of leaves that can be harvested without exhausting the resource (Vormisto 2002).

3 Cases of community forestry in the Amazon

3.1 Community forest management: Definitions and challenges

As described in Section 2, traditional livelihood strategies in the Peruvian Amazon include multiple products from the forest–farm interface. Therefore, CFM is only one of several elements in rural livelihood strategies, although it does have the potential to be a major approach to supporting the production of timber or NTFPs for economic gain (Gaviria 2010). For many decades, forest policies in Peru reflected little government interest in the long-term management of forests. Under the 2000 forestry law, however, initiatives for forest resource management emerged among peasant and native communities in the Amazon. For example, in 2005, more than 50 of these initiatives received some form of support from national or international NGOs (SNV 2005). Of the 50 CFM initiatives identified in 2005, 74% had timber production as their objective, 20% had NTFP collection as the goal

and 6% targeted the protection of environmental services (Suárez 2005). Despite this number of initiatives, there is relatively little published literature on CFM in the Peruvian Amazon, and reports from environmental NGOs working on the issue are not readily available. For example, a January 2014 Web of Science search for “community forest* AND Peru*” yielded only 7 hits, whereas a similar search for Brazil yielded 40 and for Nepal yielded 184.

The following section summarizes formally recognized CFM experiences in the Amazon.

External projects. Externally supported CFM initiatives are often focused largely on forest management by titled native communities (Stoian 2005) and most of the CFM literature for Peru concentrates on these initiatives (some of which we highlight in the following sections). The results are diverse, from reports of communities successfully managing timber resources and attaining forest certification, to cases of failed attempts at timber management that ended up in illegal logging and conflicts. In most cases, the literature only reports experiences of CFM for timber for a specific period, which usually coincides with the lifespan of a project; however, there are few reports on the monitoring or continuation of these projects. As is the case globally with development projects (Blom et al. 2010), there is also often a bias against reporting on negative results or projects that failed.

Nevertheless, indigenous communal management offers only a narrow view, as the non-indigenous residents of the Peruvian Amazon who use and manage forests also practice individual and collective modalities of forest use. Therefore, in this review, we define CFM broadly to refer not only to forest management by native communities (the *de jure* form), but also customary forms of forest management conducted by peasant communities, *riberenos* and colonists (Suárez 2005) on private property or on state-owned or public lands. We do not look at timber concessions because, despite being forest areas (allocated for private harvesting) on public lands, they represent a special category of forest management conducted mostly by private small and medium forest enterprises whose scale of management and legal demands are greater than most CFM projects in the Amazon (see Cossío 2009 for an overview of this topic).

Even though government- and NGO-supported CFM initiatives have historically been designed

for native and *campesino* communities in Peru, extra-official and organic initiatives have also arisen, including the following.

Company–community partnerships. Partly in response to the limitations of community forestry, company–community partnerships have recently been proposed as a means for community involvement in the forestry sector in a way that uses market mechanisms so as to be able to work without donor funding (Mayers and Vermuelen 2002). Although company–community interactions can often be exploitative and/or paternalistic (Medina and Shanley 2004; Cronkleton et al. 2011b), positive examples of company–community partnerships are emerging in developing countries (Mayers and Vermuelen 2002; Rival 2005). Yet, despite some emerging examples in Brazil (Medina et al. 2009; Menton et al. 2009), little is known about the extent of such activities in Peru. Medina et al. (2009) found that in the Masisea district of Ucayali, all of the 96 study communities had engaged in some form of company–community logging contracts in the previous 10 years, whereas only one community had participated in a CFM project. Although much of the discourse around logging in indigenous lands focuses on illegal loggers who extract timber from within their reserves, in many cases, indigenous communities have developed deals with loggers to sell the standing timber for them to harvest (Southgate and Elgegren 1995; Bueno et al. 2006). SPDE and CONAP (2013) found evidence of company–community partnerships among three native communities in the Selva Central. In the Brazil nut concessions of Madre de Dios, where logging is widespread (Cossío Solano et al. 2011; Chávez et al. 2012), most Brazil nut harvesters reported that they depend upon companies to carry out the timber harvesting. As most of these arrangements are informal (if not illegal), there is little literature or information about how they function in practice, nor is there any specific analysis of their impacts on forests or rural livelihoods.

Endogenous smallholder-led forestry. Many examples are emerging of smallholder forestry initiatives that do not depend upon external actors (Pokorny et al. 2010); indeed, this may even be the dominant management paradigm in many cases. The literature is relatively recent but a few studies of relevance to Peru are available. It has been reported that some *ribereños* in the Amazon manage timber resources (Coomes 1996). De Jong (2001)

reported that *ribereños* from Yanallpa, a *caserio* of the lower Ucayali River, nurture trees, in addition to growing annual crops. *Cedrela odorata* (cedar) and *Calycophyllum spruceanum* (*capirona*) are the two native timber species most common in Yanallpa fields; these species appear spontaneously in the floodplains and are easily incorporated into management because of their high commercial value. Similarly, Pinedo-Vasquez (2002) found that *ribereños* from the region of Muyuy (near Iquitos, the largest urban center in the Peruvian Amazon), having experienced booms and varying intensities of land and resource use, maintain stocks, in commercial volumes, of valuable timber species (e.g. mahogany, cedar and *Ceiba pentandra*) on forest holdings of, on average, 15 ha. He reported that these stocks are the product of a long management process that begins with the protection of seed trees and seedlings that grow spontaneously in the fields and fallows belonging to the people of Muyuy. Despite their difficulties in obtaining formal titles and authorization, *ribereño* communities do find informal channels through which to sell timber.

In a study of cases of smallholder forestry in Ecuador, Brazil, Bolivia and Peru, Hoch et al. (2009) found that 61% of cases had been initiated by smallholders and had received no external support. These smallholder-led initiatives focused primarily on home gardens and cultivation of single trees. Putzel et al. (2013b) found that the majority of the migrant households they interviewed in Ucayali were actively managing natural tree regeneration and enrichment planting of hardwood species in their forests. Bolaina (*Guazuma crinita*), a fast-growing timber species, is an important commodity for smallholders in the Peruvian Amazon and is managed largely without external support or intervention (Putzel et al. 2013a). Many small-scale collectors of NTFPs also operate informally. For example, it is estimated that smallholders near Pucallpa, Ucayali, produce 80 times the amount reported in national statistics (Bennett-Curry et al. 2013) yet this happens largely via informal channels and internal management decisions (Bennett-Curry, unpublished report).

3.2 Examples of CFM projects in Peru

As most of the literature on CFM examines large externally supported initiatives, here we review several key case studies from the Selva Central (the COFYAL project, the Ashaninka project,

the Participation Project), Ucayali (Callería and other Shipibo villages), Madre de Dios (Brazil nuts) and regional projects (FORIN). We divide these projects into those that focused mainly on timber production and those that focused on NTFP management and commercialization. We also highlight some emerging initiatives that have the potential to further support CFM in Peru, namely the National Program for Forest Conservation (PNCFB), the National Forest Inventory and REDD+.

3.2.1 Timber management projects

COFYAL

One of the oldest and most widely studied projects involving timber management by indigenous communities was the Yanesha Forestry Cooperative (COFYAL) in the Palcazu Valley in the department of Pasco. COFYAL was established in 1986 as part of the forest management component of the Special Project Pichis Palcazu (PEPP) (Ocaña-Vidal 1992; Staver et al. 1994; Benavides and Pariona 1995; Elgegren 1996; Morrow and Watts 1996). PEPP started as a traditional colonization project, with the objective of building roads so that Andean colonists could occupy the Amazon. In response to pressure from indigenous peoples living in the project area, however, other components were subsequently added, such as granting titles to Yanesha communities (before the construction of the road in the valley), forest management, sustainable commercial agriculture and the creation of conservation areas (Benavides and Pariona 1995). The forest management component was designed by the Centro Científico Tropical de Costa Rica and funded by the United States Agency for International Development (USAID) in conjunction with the Peruvian government (Ocaña-Vidal 1992; Benavides and Pariona 1995). USAID later withdrew because of violence in the area, and the World Wildlife Fund took over the funding of the co-op (through ProNaturaleza, a Peruvian NGO) in 1988. Under this project, a strip shelterwood system was implemented as a mechanism for the harvesting and natural regeneration of 1600 ha of forests from four Yanesha native communities with the aim of managing the forest on a sustained-yield basis over a harvest cycle of 40 years (Benavides and Pariona 1995). A wood-processing plant was installed and several community members received “intensive, long-term training” and technical assistance on management plans, technologies for forest extraction, marketing and accounting. In addition, the assisting NGO provided salaries for plant

personnel and purchased some heavy equipment (Staver et al. 1994).

This donor-organized project operated until 1993, but was beset by internal problems that included technical difficulties, such as scale incongruence with local capacity and the need for imported equipment and materials (Morrow and Watts 1996). A further problem was the project’s top-down approach and lack of consultation, which led to incompatibility with local interests and contexts (Rondón et al. 2013), and disagreements between the co-op, community members and the supporting NGO. For example, community members criticized the way indigenous leaders ran the co-op, especially their limited managerial capacity (Benavides and Pariona 1995). Difficulties balancing the demands of co-op activities and subsistence activities resulted in conflicts within and/or between families (Lázaro et al. 1993), and absenteeism was common at the co-op when workers abandoned their positions to return to subsistence activities. Moreover, external factors, such as the lack of market access for forest products and the increase in violence and terrorism in the area, reportedly played a large role in the failure of this project (Benavides and Pariona 1995). Morrow and Watts (1996) provided a detailed analysis of the COFYAL failure, viewing it through the lens of principles of common pool resources. They attributed the failure to the following factors: (1) the failure to generate the profits that community members had expected; (2) high social transaction costs for communities, because co-op members were required to spend less time performing their duties in their own communities or households; (3) the complex design that assumed the adoption of new economic organizations and cooperation between communities; and (4) external pressure, such as the encroachment onto forests by colonists and loggers. Others cited an inherent disjunction between the cultural norms of the Yanesha and the management system proposed (Gram 1997). After COFYAL ended, community members participating in the co-op continued to extract timber and began to sell it to private companies; they did so without any management plan (Morrow and Watts 1996).

ITTO: Ashaninka

Not far away from the COFYAL project, in the Pichis River valley in the department of Pasco, seven Ashaninka communities participated in a timber management project supported by the International Tropical Timber Organization (ITTO), titled *Uso Sostenible y Reforestación de los Bosques Amazónicos por Comunidades Indígenas*. The project,

which started in the late 1990s, was intended to promote sustainable use of forests. Before the project was set up, proponents found that leaders — or the heads of families — from the native communities had been selling their commercially valuable timber illegally to loggers at low prices (Loayza Villegas 2004). Community members both lacked the skills necessary to estimate tree volumes and the technical and business capacity to negotiate successfully with loggers (Loayza Villegas 2004). Project proponents believed that community members gained valuable skills in estimating log volumes and negotiations after participating in the ITTO project (PD14/98 REV.1 (F)). They claimed that, thanks to the training received and discussions among community members, participants were able to set a minimum price per board-foot for standing timber (and for several valuable species). Although two of the participating communities agreed not to sell their timber until they had obtained their own logging permits, results in the other communities were less successful in gaining residents' agreement to comply with norms (Loayza Villegas 2004).

AIDER: Shipibo-Conibo

The NGO AIDER (Asociación para la Investigación y el Desarrollo Integral) has implemented forestry initiatives in several departments in Peru but there is little published literature on these initiatives outside of project documents. Before participating in the AIDER CFM project, community members had entered into disadvantageous agreements with loggers, under which they received very low prices for their timber. Community members sold individual timber trees for PEN 20 (approximately USD 6.3) without adjusting the price for tree species or volume (Bazán and Nalvarte Armas 2007).

Among these projects, one successful case is that the Callería native community, a Shipibo-Conibo ethnic group located near the city of Pucallpa in Ucayali, which was among the first native communities in Peru to attain FSC certification (Bueno et al. 2006; Rodríguez and Cubas 2010). For decades, Callería residents had entered into agreements with loggers that wanted to harvest their timber resources. In this project, community members received technical assistance and training on the importance of the management plan as an instrument for sound timber management (Porro et al. 2008). They were also trained in reduced impact logging techniques, valuation of tree species, estimation of log volumes, negotiation skills and accounting (Bazán and Nalvarte Armas 2007). The community formed an organization to manage 2528 ha of

forest for timber extraction (Bueno et al. 2006) and AIDER presented the management plan to INRENA. However, approval of the management plan was delayed because some parts of the Callería management area overlapped with another forest concession. In 2004, two years after AIDER had presented the management plan to INRENA, the plan was approved and the community could legally harvest and sell the timber. AIDER acted on behalf of five Shipibo-Conibo native communities and, by the end of 2005, had attained forest certification for all of them, with a total of 35,000 ha of forest under management (Bazán and Nalvarte Armas 2007).

Despite the strengths and significant advances made by the Callería community in developing both their organizational capacity and their capacity for forest and business management, some issues may reduce the likelihood that this community will continue their sustainable timber management. For example, some community members do not accept the community's management plan and continue making individual deals with illegal loggers (Bueno et al. 2006; Porro et al. 2008). Moreover, the community is still dependent on NGO support to develop their management plans and marketing strategies (Gaviria and Sabogal 2013).

CEDIA: Participation Project

Another large-scale project that promoted sustainable forest management by communities was the Proyecto Participación (Participation Project) run by the NGO CEDIA (Center for Development of Amazon Indigenous Peoples). It ran from November 2006 to April 2010 with the support of the European Union, and was located in six watersheds: Upper Madre de Dios, Urubamba, Chambira, Nanay, Gálvez and Yaquerana. Forty-nine native communities and 10 peasant communities, with a total of approximately 2900 families, were involved.

Gaviria (2010) reported on the Nueva Union community, a settlement of Uruarina indigenous people in the Chambira river basin, in Loreto, which was involved in the timber management component of the Participation Project. The final project report indicated that the Nueva Union residents gained experience and knowledge in timber management and reduced impact logging techniques, and received additional income (Gaviria 2010). The report claimed that, through the project, the community developed a management plan for timber and completed sales for the 2008–2009 and 2009–2010 seasons; the harvesting of 120,000 board-feet of the lesser known timber

species *cumala* (*Virola* sp.) generated a profit of PEN 35,000 (approximately USD 11,600), which was distributed among community members. Despite the training provided by CEDIA, community members still have difficulties with measuring their production and preparing the necessary paperwork (Tuesta 2010).

The Participation Project also included a reforestation component, which worked with 40 of the 49 native communities in five of the six river basins (in Loreto, Cusco and Madre de Dios). As part of this component, community members received training and access to economic incentives for reforestation. They received PEN 7 (approximately USD 2.3) for every sapling that reached a height of 2 m after 18 months. If a sapling died during the later management period, the community had to either return the funds or replace the dead sapling. In this way, community members ensured that the full number of trees grew to maturity by replacing dead saplings. At the end of the 3.5-year project, 456 ha had been reforested, including both timber plantation and agroforestry systems (Gaviria 2010).

WWF: FORIN

One of the largest CFM projects in the Peruvian Amazon was FORIN, or *Fortalecimiento del Manejo Forestal Sostenible en Territorios de Pueblos Indígenas en la Amazonía del Perú*, run by WWF-Peru in association with Danish NGO IBIS, Italian NGO Cooperazione e Sviluppo (CESVI) and Agro Acción Alemana (AAA). FORIN was initiated in 2005, with the following objectives: (1) institutional strengthening; (2) territorial planning, sustainable forest management and forest certification; and (3) direct economic benefits, through the formation of community enterprises. Forty-three native communities in four regions (Ucayali, Madre de Dios, Loreto and Junin) took part in the project. During the four-year project, proponents tried to overcome a major problem associated with Peru's regulatory framework for the forestry sector: the use of native communities' timber harvest permits to facilitate illegal logging (Otárola et al. 2009). Timber management was the principal focus of FORIN because of its potential to increase income for these communities. The exception was Madre de Dios, where the focus was on Brazil nut management because of the communities' long tradition in this activity and a suggestion by a project partner that timber harvesting could reduce the sustainability of Brazil nut production. Even so, FORIN took place at the same time as the initial approvals of logging in Brazil nut concessions by INRENA (Cossío-Solano et al. 2011).

In their evaluation report on FORIN, Otárola et al. (2009) explained that most of the 43 participating communities had engaged in illegal logging before the project got underway, because they lacked the knowledge and the financial and technical resources to comply with forestry laws. Moreover, many of these communities had entered into disadvantageous deals with loggers who paid very low prices for their timber. In addition, the indigenous territories were not properly demarcated and overlapped with land held by other forest users. Through their participation in FORIN, 24 of these communities managed to have their territorial boundaries fully demarcated and legally recognized. In addition, 32 received management plans and the knowledge of how to measure volumes and so improve their negotiations when selling timber (Otárola et al. 2009).

Given the short lifespan of the FORIN project, Otárola et al. (2009) could only estimate its potential impacts, but could not quantify its long-lasting benefits. For example, some of the beneficial aspects of the project were that: (1) the project encouraged the elaboration of management plans for 32 communities (26 for timber and 6 for NTFPs) and attempted to strengthen technical and financial capacities (e.g. use of compasses, tree identification and directional felling, use of forest machinery and harvesting skills); (2) the project tried to improve community members' negotiation skills by providing them with practical knowledge about the timber market; and (3) the project sought to raise communities' awareness of legal planned management as a means of achieving ecosystem conservation and economic growth, although 'awareness' does not guarantee adoption of legal requirements (Otárola et al. 2009). The authors felt that the communities needed more formal training, field experience and practice with administrative tasks to be able to complete the necessary procedures and/or bureaucratic requirements to request harvest permits and maintain legal operations (Otárola et al. 2009).

3.2.2 Community conservation and development

One of the largest conservation projects in the Peruvian Amazon was run by the World Bank in 2001: The Indigenous Management of Protected Areas in the Peruvian Amazon Project. This project targeted 7.6 million ha of forests and involved 200 indigenous communities living in two protected areas (Pacaya Samiria National Reserve in Loreto and El Sira Communal Reserve located in parts of Pasco, Huanuco and Ucayali) and three other areas

that were categorized as reserved zones² during the lifespan of the project (Güepi Reserved Zone in Loreto, Purus Reserved Zone in Ucayali and the Santiago-Comaina Reserved Zone in Amazonas). The main design feature of this project was the introduction of a co-management system based on stakeholder participation in the conservation of protected areas. The co-management system included participatory mechanisms, such as: (1) consultative groups formed by indigenous representatives to advise on management of the area; (2) communal reserves, as formal protection areas, with administrative contracts established between indigenous communities and INRENA for the sustainable use of natural resources; (3) natural resource management contracts, which are formal agreements between the community and INRENA under which the community commits to using natural resources sustainably and on a small scale and INRENA commits to providing technical assistance; and (4) community surveillance systems to monitor the area for illegal activities. Although the project did not have timber management as a specific objective, it included 22 forestry-related initiatives targeting reforestation and forest management and the development of five management plans for timber in El Sira (Ucayali) and Pacaya Samiria (Loreto) (World Bank 2007). According to the World Bank report on the project, only one management plan was implemented. The evaluators reported that the project had a positive impact on conservation; that beneficiaries in the 200 indigenous communities involved learned and implemented a range of conservation practices such as forest management, expansion of hydro-biological resources (e.g. fish) and eco-friendly agriculture; and that communities received economic benefits in the form of higher timber prices and income from fishing (World Bank 2007).

3.2.3 Initiatives to support local management of NTFPs

Brazil nuts

In 2000, the Peruvian government initiated a program to formalize forest access rights for rural people whose livelihoods depend on the collection of Brazil nuts. In contrast to Brazil and Bolivia, where the governments attempted to formalize access by defining as communal properties those areas that corresponded to residents' customary

tree tenure (Ehringhaus 2005; Cronkleton et al. 2010), the Peruvian system formalized rights by defining small concessions, through which individual Brazil nut collectors' access rights were recognized. Documenting and formalizing these concessions was a major undertaking attempted in a tight timeframe, carried out with the assistance of NGOs. As of 2011, 1134 concessions were registered in the National Land Registry (Chávez and Quaedvlieg, 2012).

Several projects have been implemented to support Brazil nut harvesters in Madre de Dios. For the most part, these projects have focused on helping the harvesters inventory the trees inside their concessions and develop the necessary management plans to maintain legal access to the nuts. NGO technicians geo-referenced Brazil nut trees concession holders (i.e. every tree was given a unique identifying number and marked with an identification tag), as were the trails used by each collector. This information has been used to create maps of the areas where Brazil nut trees grow. Thus, mapping the spatial layout of Brazil nut trees has made it possible to define area boundaries for each Brazil nut collector (or *castañero*), each of whom has been given a map in which the Brazil nut trees are numbered and access roads identified.

Some notable projects include the following:

- ACCA (Amazon Conservation Association) ran a project titled "Formalizing Forest Access and Implementing Sustainable Brazil Nut Management in Madre de Dios, Peru" from 2003 to 2005. ACCA (2005) reported working with 150 harvesters to help them develop a management plan and supporting the development of a harvesters association (ASCART).
- As part of the FORIN project (see Section 3.2.1), CESVI assisted residents of four indigenous communities in complying with technical rules for formalizing Brazil nut extraction. A total of 543 people from four native communities (Puerto Arturo, Boca Pariamanu, Tres Islas and Palma Real) participated in Brazil nut management under the FORIN project. After participating in the project, the communities had reportedly achieved the following: (1) their territorial boundaries had been legally recognized, which solved their previous problems with overlapping land allocations, and their Brazil nut areas were organized; (2) communities had reached a consensus about the management of their forest resources, and implemented management plans for Brazil nut harvesting that were approved

² In Peru, a reserved zone is a transitional category of protected area that requires complementary studies to determine its extent and final categorization.

by the competent authority; and (3) two communities attained certification for their Brazil nut areas, and received increased income from Brazil nuts (CESVI 2009). The project also helped the communities to develop management plans for timber extraction within their Brazil nut forests (Chávez and Quaedvlieg 2012).

- CAMDE (Environmental Conservation and Development) worked with 250 harvesters to develop their management plans as part of the project Conservation of Brazil Nut Forests.
- A conservation and development project led by ProNaturaleza, titled “*Proyecto Integral de Conservación y Desarrollo en el Parque Nacional Bahuaaja Sonene y su área de influencia*,” worked with two Ese’ejas communities in Palma Real and Sonene to facilitate the division of their territory for Brazil nut harvesting (Melgarejo et al. 2006).

Palms

Manzi and Coomes (2009) reported on a successful management initiative for the *aguaje* palm in the peasant community of Roca Fuerte, a group highly dependent on natural resources. The group was involved in a palm management program run by CEDIA that promoted harvesting of the wild fruit using a locally developed palm climbing device. The community declared 40 ha of *aguajales* (areas in which the *aguaje* palm grows) as protected areas in which the harvesting of palm by felling was prohibited. The initiative included a program for monitoring the area and the quantity of *aguaje* harvested. In addition, the project encouraged community members to grow the palm in their home gardens and to replant *aguaje* areas. The authors attributed the success of this initiative mainly to the following factors: (1) most community members committed to the more sustainable management of palms; (2) the NGO provided support and assistance in securing communal tenure, inventorying palm densities, purchasing climbing equipment and establishing a palm nursery; and (3) this palm fruit is an important source of cash income (Manzi and Coomes 2009).

In the same region, Gaviria (2010) reported that the native community Santa Cruz de Tagual (Chambira river basin, in Loreto) also participated in the CEDIA project. As part of the CEDIA project, the community developed a management plan for the harvesting of another palm species, *yarina*, also known as vegetable ivory (*Phytelephas macrocarpa*). Through their participation in the 3.5-year project, the community generated additional income.

In the Pacaya Samiria Reserve in Loreto, a ProNaturaleza/TNC project worked with local communities to develop management plans for fish and palms (Kilbrane Gockrel and Gray 2011). An independent project evaluation found that the community members felt that the project had had beneficial results for both the target species and livelihoods but, as with other projects, trade-offs with other subsistence activities and challenges associated with participation were limiting factors (Kilbrane Gockrel and Gray 2011).

Camu-camu

Another important NTFP that is managed in several *ribereño* communities in the northeast of Peru is *camu-camu* (*Myrciaria dubia*), a fruit rich in vitamin C. In 1996, the government launched a reforestation program (Programa Nacional de Camu-Camu, or PNCC) to encourage *ribereños* from northeastern Peru to cultivate *camu-camu* in their fields as a way to improve their incomes (Pinedo-Vasquez and Pinedo-Panduro 1998). A study on 28 *ribereño* communities that participated in the PNCC found that the project was most successful for those communities that combined government protocols with local agricultural practices (Penn 2008). However, despite the economic incentives provided by the *camu-camu* cultivation projects, many *ribereños* decided not to participate, saying that the package offered did not suit their management needs. Pinedo-Vasquez and Pinedo-Panduro (1998) suggested that a limiting factor was that cultivating a new species requires expertise and interest, because of various ecological, economic and social factors, but not all *ribereños* had that expertise and most technicians did not offer it.

3.2.4 Emerging initiatives: PNCB, National Forestry Inventory and REDD+

Recently, the Peruvian government has increased its support for CFM with three initiatives, namely the National Program for Forest Conservation (PNCB), the National Forest Inventory and Reducing Emissions from Deforestation and forest Degradation (REDD+). Each of these is described below.

National Program for Forest Conservation (PNCB)

The PNCB began in 2010 as a government-funded initiative aimed at supporting the sustainable management of community forests in Peru in order to meet the government’s target of conserving 54 million ha of forest by 2021 (MINAM 2013). The program began working in the Selva Central

with indigenous communities (indigenous lands cover 20% of the forest area under concern, or 10.8 million ha) (MINAM 2011). According to the program's official statistics, 2325 families in 48 communities have signed up to participate (MINAM 2013). Each community receives an annual payment of PEN 10 per hectare of forest conserved under the program. They also receive technical support to develop business plans and plans to invest the money back into sustainable production activities. The money is given as a Direct Conditional Transfer, of which 20% can go toward social projects and 80% must go toward projects that promote sustainable production and forest management (MINAM 2011). Some of these communities will opt to invest in CFM initiatives as part of their development plans, although the extent of uptake remains to be determined. Some communities that already participate in CFM projects, such as the Coriteni Tarso community in Junín, have signed up to the PNCB (Gaviria and Sabogal 2013).

National Forest Inventory and CFM

As part of the National Forest Inventory, which is funded by Finland and carried out by the UN Food and Agriculture Organization (FAO) in collaboration with the Peruvian ministries of agriculture and environment, FAO has been giving Peru technical support to foster CFM. One part of this initiative has been the systematization of six cases of CFM in Peru to help gather lessons learned and recommendations for future initiatives (Gaviria and Sabogal 2013). The cases include the following: (1) promotion of CFM in new forestry legislation; (2) Community Forest Watch by the indigenous representative organization ORAU (Organización Regional de AIDASEP-Ucayalli) in Ucayali; (3) CFM for timber extraction in Callería in Ucayali; (4) CFM for timber extraction by Coriteni Tarso in Junín; (5) management of *aguaje* by Veinte de Enero in Loreto; and (6) ecotourism by Palotoa Teparo in Madre de Dios. Gaviria and Sabogal (2013) highlighted the importance of community participation in design and implementation, inclusion of traditional knowledge in management plans, and market studies to assess the potential for commercialization.

Reducing Emissions from Deforestation and forest Degradation (REDD+)

The introduction of REDD+ has brought a new wave of investment in CFM with the aim of maintaining carbon stocks. The recently approved Forest Investment Plan (FIP) includes promises

to dedicate USD 3 million to programs that support CFM in indigenous communities and another USD 2.5 million to indigenous governance (Climate Investment Fund 2013). The details of how FIP funds will be spent are still to be determined. In addition, in its Readiness Preparation Proposal (RPP), the government noted the importance of supporting sustainable forest management under REDD+ (MINAM 2013). As part of its project with the Ashaninka in the Selva Central, the NGO Ecotribal is working with Cool Earth to provide payments to indigenous communities so they can refuse to sell their timber to illegal loggers active in the region (Ecotribal 2013). The AIDER project that involves helping indigenous communities in Ucayali attain FSC certification for timber management (described in Section 2.3) has transitioned to a REDD+ project. Many other existing REDD+ projects contain components that support community agroforestry projects, intensification of agricultural production and/or sustainable forest management.

3.3 Main challenges for CFM in the Peruvian Amazon

Whether community groups engage in forest management depends on the community members' characteristics and motivations as well as on the broader context in which communities operate, including the type and quality of the forest, distance to markets, the availability of support and the presence of forest law enforcement agencies (Sabogal et al. 2008). Although there is great diversity of user groups, varied frontier processes and heterogeneous forest resources, CFM project initiatives have focused on a narrow set of cases. Even though the predominant mode of resource use takes place in subunits of communities (households, extended families or other subgroups) and in informal contexts, this widespread type of management has received little attention in the literature outside of studies of swidden and references to cases of illegal logging. CFM in the Peruvian Amazon follows two distinct paradigms: (1) externally supported CFM projects that foster legal compliance and seek sustainable timber management or NTFP commercialization and (2) endogenous smallholder-led forest management, which is often informal and does not necessarily adhere to forestry law. Although all CFM models must deal with the common challenges of cumbersome forestry legislation, insecurity of land tenure and

poor access to markets, CFM projects are often externally led and so face the additional challenges of incompatibility with local needs and capacities, and dependence on external financial and technical support. As endogenous smallholder-led management often operates outside of formal channels, challenges include susceptibility to manipulative or inequitable deals, limited access to credit, and a lack of information and knowledge sharing around best practices.

The administrative burden of legal compliance can also jeopardize the sustainability or success of a CFM initiative. In the Amazon, the process of granting usufruct permits to communities creates major challenges; the process is usually slow because of state bureaucracy and some of the procedures are too complex for native communities to cope with well (Gaviria 2010). Another problem in obtaining a harvest permit is that the technical requirements and content for management plans are such that they must be developed by professionals registered with the government. The complexity of the requirements makes them inaccessible to communities. This creates a market for unscrupulous operators who create falsified management plans (Uruunaga et al. 2012) and/or forces communities to depend on external support from NGOs to develop their management plans and carry out forestry activities. Perhaps more importantly, however, is that even legitimate management plans based on accurate forest inventories often contribute little to decision-making processes and are carried out purely to fulfill bureaucratic requirements.

Security of land tenure is another major challenge. Although indigenous and *campesino* communities can be granted rights over forested areas, other smallholders cannot attain a title to forest land. This is because titles apply only to agricultural land, although forest use rights can be granted. For many indigenous and *campesino* communities, land titles are still pending. Even for communities that do have legal rights over forests, rights remain insecure because use rights to below-ground resources (mining, hydrocarbons) can be granted on the same lands. These insecurities jeopardize long-term forest management planning.

Market access is another, multifaceted, challenge for all CFM in the Peruvian Amazon (Gaviria and Sabogal 2013; Rondón et al. 2013). Common issues include distance to markets, unreliable transportation and competition from larger-scale commercial

enterprises. However, some of the challenges are related to a failure to fully evaluate the potential market for the proposed products as part of the pre-project market studies (Melgarejo et al. 2006; Rondón et al. 2013). In addition, the dominance of informal markets and illegal products means that market prices may not cover the transaction costs incurred when producing products legally. Onerous legislation exacerbates this problem.

For externally driven CFM in the Peruvian Amazon, a major problem is dependence on external financial and technical support to establish the required organizational capacity (Porro et al. 2008). CFM projects require various investments, including for equipment and materials, working capital and external labor. In contrast to informal and illegal harvesting, CFM projects have the additional expenses of developing management plans and obtaining authorization permits. Technical assistance is also necessary to complete resource inventories and to develop simpler and more efficient management techniques (Manzi and Coomes 2009).

A further challenge for many CFM initiatives in the Peruvian Amazon is that they are restricted to the limited timeframe of an NGO project. Because the high costs of maintaining legal compliance are out of reach for many communities, the community reverts to its previous practices when the project ends and financial assistance stops.

Another result of the short lifespan of NGO projects is that many initiatives lack assistance strategies (or *acompañamiento*, i.e. assistance and support that builds local capabilities) for developing community capacity (SNV 2005); this lack jeopardizes the sustainability of institutions for community forest resource use. The success of CFM projects also depends on the socioeconomic characteristics of a community and the community members' commitment to managing their forest resources more sustainably (Manzi and Coomes 2009). In some cases, such as COFYAL, communities revert to informal management practices after the project fails (Rondón et al. 2013).

The dependence on external input often means that CFM projects follow top-down approaches and fail to fully account for local needs and capacities (Rondón et al. 2013), rendering the projects ill-suited to the local context. Recent discourse has called for greater consultation and participation in all aspects of CFM project development (Gaviria and Sabogal

2013; Rondón et al. 2013). Gaviria and Sabogal (2013) pointed to a need for capacity building that goes beyond purely technical aspects to include organizational, administrative and negotiation skills, in order to foster long-term improvements in CFM.

Informality of markets and production systems is a challenge for the endogenous smallholder-led model. Although many of these systems appear to have been successfully adapted to local conditions and include important components of smallholder livelihood systems (Putzel et al. 2013a), the lack of access to credit and knowledge sharing on best practices may prevent them from reaching their full potential.

One key finding of this review is that there is a general lack of scientific analyses of CFM in Peru: most information is available only via project reports prepared by project proponents and/or donors, which may not give objective assessments of project outcomes. Given the long history of forest management in local livelihood strategies and the diversity of initiatives aimed at promoting sustainable forest management by communities, we can expect Peruvian experiences to offer a rich array of lessons learned (on strengths and weaknesses), following systematic data collection, analysis and synthesis.

4 Conclusions

In Peru, forest resources make an important contribution to rural livelihoods, particularly in the Amazon region. Traditionally, most forest use in the Peruvian Amazon has been for subsistence; however, indigenous peoples and other traditional forest users (*riberños* and colonists) also engage in commercial activities to generate income from forest products. Despite ancestral use of Amazonian forests by traditional users, they continue to struggle for access to forests and land rights, which jeopardizes their livelihoods, particularly given increasing deforestation rates.

Community forest management takes many forms. People throughout the Amazon have long used shifting cultivation systems that rely on forest resources; timber and NTFPs are central to these groups' livelihoods. Typically, forest resources have been exploited through informal channels with little oversight or control by the state. Since the forestry law came into force in 2000, introducing radical

changes aimed at improving forest management practices, environmental NGOs have introduced many new CFM initiatives among peasant and indigenous communities. However, little documentation on these initiatives is available; what is known is that experiences from most of these initiatives are recorded only in project reports or similar gray literature, written during or at the end of project cycles with little long-term monitoring.

To date, most CFM projects have provided indigenous communities with external support for timber management; by contrast, scientific studies have focused on forest use within subsistence livelihood systems. Given that there are approximately 2 million non-indigenous rural Amazonians in Peru, the forest footprint and market impacts of non-indigenous smallholder forest management are likely to be much greater than recognized. However, very little is known about these endogenous smallholder-led systems. More research is needed to increase our understanding of the heterogeneity of these systems and the opportunities and challenges that they represent. A deeper understanding of both externally supported and locally led CFM will be necessary to help evaluate the strengths and weaknesses of the management strategies and systems in place, and to identify development interventions and public policies that can move toward better forest management.

5 References

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CIFOR Working Papers contain preliminary or advance research results on tropical forest issues that need to be published in a timely manner to inform and promote discussion. This content has been internally reviewed but has not undergone external peer review.

This review summarizes the published literature, as well as any available information provided by NGOs or project proponents, on the practice of community forest management (CFM) in the Peruvian Amazon. It provides an overview of literature related to land-use and forest management by rural populations in the Peruvian Amazon, placing this information in the broader context of the forestry sector in Peru. The review describes the different manifestations of CFM in Peru and the most widely studied cases of CFM projects. The document also examines some emerging initiatives, summarizes the main challenges for CFM and highlights important areas for future research. One key finding of this review is that there is a general lack of scientific analyses of CFM in Peru: most information is available only via project reports prepared by project proponents and/or donors.

The review stresses that community forest management takes many forms. People throughout the Amazon have long relied on forest resources for their shifting cultivation systems, and timber and NTFPs are central to the livelihoods of many. Typically, forest use has occurred informally with little oversight or control by the state. Beginning in the 1980s, environmental NGOs have introduced CFM initiatives in Peru. To date, most CFM projects focus only on indigenous communities to support timber management; by contrast, scientific studies have focused on forest use within subsistence livelihood systems. Given that there are approximately 2 million non-indigenous rural Amazonians in Peru, the forest footprint and market impacts of non-indigenous smallholder forest management are likely to be much greater than recognized. However, very little is known about these endogenous smallholder-led systems. More research is needed to increase our understanding of the heterogeneity of these systems and the opportunities and challenges that they represent.



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