

Chapter 5

Lever for Alleviating Poverty in Forests and Tree-Based Systems

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Abstract

An extensive set of policies, programmes, technologies and strategies have been implemented in the forest sector. Collectively, these 'levers' cover a diverse range of approaches, at a variety of scales and are governed by many different stakeholders. It is important for decision-makers to understand which levers might be most useful in achieving poverty alleviation. This chapter seeks to answer the question: which forest management policies, programmes, technologies and strategies have been effective at alleviating poverty? We studied 21 different rights-based, regulatory, market and supply chain, and forest and tree management levers for which we could identify a plausible theory of change of how implementation of that lever might alleviate poverty. For every lever we: define and describe the lever; describe the logic or theory of change by which the lever might plausibly be expected to alleviate poverty; summarise the available evidence showing how the lever has alleviated poverty; and discuss the variables that explain heterogeneity in outcomes. Overall, we found substantial, varied and context-dependent evidence of these levers being associated with mitigating poverty (i.e., by improving well-being). We found limited evidence of these levers being associated with reducing poverty (i.e., moving people out of poverty). Some of the strongest evidence for poverty reduction came from ecotourism, community forest management, agroforestry and, to a lesser extent, payments for ecosystem services (PES). A multitude of cases showing positive outcomes for poverty mitigation came from community forest management, forest producer organisations, small and medium forest enterprises, PES, and tree crop contract production. A combination of more rigorous and long-term research designs, along with examinations of the cost-effectiveness of different levers, would go a long way to contributing to the design of effective interventions for poverty alleviation.

5.1 Introduction

Governments, donors, international organisations, companies and communities have used a diverse array of policies, programmes, technologies and strategies in the *forest*⁷ sector to reduce poverty (or at least, improve *human well-being*) as the primary or secondary goal. These 'levers' include regulatory and voluntary strategies, are implemented at a variety of scales, and affect and are governed by many different stakeholders. Many levers affect poverty and well-being in conjunction with other aims: to reduce *deforestation*, conserve *biodiversity* or reduce greenhouse gas emissions. The purpose of this chapter is to assess how and to what extent different forest sector policies, programmes, technologies and strategies (hereafter 'levers') have been effective in alleviating poverty. This chapter identifies forest-sector levers that could plausibly alleviate poverty, and evaluates the strength of available evidence for the effect that each lever has had on reducing poverty (moving people above a certain threshold of income or consumption) and mitigating poverty (lessening deprivation or disadvantage such that well-being is improved). That is, we focus on two roles that *forests and tree-based systems* play in *poverty alleviation* as identi-

fied in Chapter 2: 1. movement out of poverty and 2. supporting well-being. To a certain extent, we also consider where a lever may have led to an increase in poverty. We identified 21 levers, and reviewed them individually.

To identify the key levers, firstly Coordinating Lead Authors and Lead Authors for the chapter brainstormed the full range of possible levers. All other members of the Global Forest Expert Panel on Forests and Poverty subsequently reviewed the list to suggest any additional levers that were missed during the first step. No new levers emerged. While this provides some confidence in the robustness of the initial list, we cannot be certain that some relevant levers escaped our initial search and scan.

We selected levers for assessment and analysis if they met two criteria. First, the lever had to be clearly related to forests and/or trees within a wider landscape as per the remit of this report: that is, they had to specifically address the management, use, conservation or *restoration* of forests or trees. Levers that were principally related to the agricultural sector or to other landscapes were not considered, even if they in principle could affect the poverty of people living in or around forests. For example, certification programmes that target agricultural products may affect people living in and around forests, but were not included. Second,

the lever had to have some plausible expectation of alleviating poverty, even when alleviating poverty was not its primary purpose. This was interpreted broadly, and included any lever with an identifiable theory of change supporting the provision of one or more socio-economic benefits from forest products and services.

5.2 Overview of the Levers

The chapter considers four main categories of levers: 1) rights-based levers; 2) other regulatory levers; 3) market and supply chain levers; and 4) forest and tree management levers (Table 5.1), acknowledging that alternative taxonomies of levers relevant to this review have been developed by others (e.g. Newton *et al.*, 2013; Agrawal *et al.*, 2018). We also acknowledge that some levers could fall into multiple categories (e.g. community forest management as an intervention often combines aspects of rights-based and regulatory reforms while engaging in markets and introducing new *forest management* practices). The taxonomic division of levers into different categories would only become pertinent if one were trying to understand whether, for example, regulatory levers were more or less effective than market and supply chain levers as an aggregate category, or if rights-based levers as a whole might be more appropriate than regulatory levers for particular country contexts. We discourage use of this review to try to extract such high-level conclusions. For every lever we: define and describe the lever; describe the logic or theory of change by which the lever might plausibly be expected to alleviate poverty; summarise the available evidence showing how the lever has alleviated poverty (e.g. by increasing income, assets or well-being) and, where available, the magnitude of those changes; and discuss the variables that explain heterogeneity in outcomes. Some of this information is summarised in Table 5.1.

5.2.1 Caveats

There are some important caveats to note. First, drawing lines between different interventions was sometimes partially arbitrary. There is considerable overlap between some of the levers. For example, third-party certification can be considered as a form of supply chain initiative, REDD+ can be conceived as a particular type of *payment for ecosystem services* (PES) programme, community forest management (CFM) can emerge through

tenure reform, and small forest management enterprises (SMFEs) can include ecotourism. As such, separating literature, and consequently the effects of these levers on poverty, into discrete categories is somewhat interpretative. It seems at least conceivable that two or more of these levers in tandem could have greater impacts on poverty than any one of them alone. We did not explore such multiplicative interactions, except to the degree that any of the literature did so by virtue of the cases or sites that they studied.

Second, many of the reviewed levers were implemented based on multiple objectives and a win-win logic: improving both conservation and well-being outcomes. In this review, we have not taken into consideration poverty outcomes in relation to other potential programmatic or policy objectives. Thus, while the levers presented may not have been the most impactful or cost-effective from a *poverty reduction* perspective, they should not be discounted as they may have had multiple positive outcomes in other realms.

Finally, it bears repeating that we did not conduct a systematic review of all available literature on each of these levers. As such, some relevant evidence may have been missed.



Wood processing plant in the state of Oaxaca, Mexico
Photo © Reem Hajjar

Table 5.1

Forest-sector levers that may alleviate poverty

SUMMARY OF THE EVIDENCE:
CONCLUSIONSSUMMARY OF THE EVIDENCE:
QUANTITY AND TYPE OF STUDIES

THEORY OF CHANGE

Rights-based levers

Tenure reform	Secure access to land and forest resources is often seen as a first step for forest-reliant poor to be able to reliably benefit, monetarily and non-monetarily, from forests.	Mostly case studies and some quasi-experimental studies. Much more evidence for land tenure reform in agricultural settings, but a fair amount also on forest property rights. Very limited assessments of tree tenure reform on poverty.	A systematic review of forest property reforms found generally positive or mixed impacts on income consumption and capital, and that devolution of more limited rights were less likely to alleviate poverty than the devolution of more extensive rights. Effectiveness of tenure reform in impacting poverty is enhanced by the presence of a number of enabling conditions and additional intervention levers discussed in this chapter. Social differentiation in tenure reform impacts is substantial.
Community forest management interventions	In recognising the rights of local user groups to common forest resources, it is expected that the users will benefit directly and indirectly from forest products and services for subsistence and commercial purposes.	There are few reliable national level assessments of the contributions of community forests to poverty alleviation. But there is a wealth of both case literature and reviews of research on community forestry. A predominant focus on South Asian cases, qualitative analyses, and data and analytical gaps prevent generalisable conclusions about observed socio-economic and environmental outcomes of community forest management.	Much case study evidence points to clear material benefits from CFM for the poor, but its potential has not been realised in most countries. Rigorous national-level analyses have shown that CFM has reduced poverty or provided economic benefits to the poor in Indonesia, Madagascar, and Nepal.
Forest concessions	Central governments or forest departments provide companies and communities with forest resource (typically timber) extraction rights in commercially valuable forests in exchange for a stream of revenues. Besides stumpage or taxes paid to governments, concession agreements often include provisions for local public goods such as employment, schooling and healthcare.	National-level statistics on concessions' contributions to national incomes are available, but contributions of concessions to local incomes and poverty alleviation are only visible for specific locations through case studies. Limited studies using national panel data or a large number of case studies.	Households living near a concession had greater wealth in Cameroon and Liberia. In Gabon, NTFPs from forest concessions minimally affected livelihoods. Case studies in general only provide limited evidence of their contributions to poverty reduction even as they generate substantial benefits and profits for large logging companies.
Protected areas (PAs)	PAs can support livelihoods by securing rights of people to forest lands, supplying ecosystem services, generating income from tourism opportunities and improving rural infrastructure.	Several national-level studies, using quasi-experimental quantitative methods. Few multi-national, quantitative studies.	Several studies show that PAs can reduce poverty, particularly where ecotourism opportunities exist (e.g. in Costa Rica and Thailand) and where local people are involved as stakeholders. However, much documentation exists of physical and livelihood displacements of rural poor for the sake of conservation.

Regulatory levers			
Decriminalisation of informal workers	Formalisation can: allow the poor to convert their possessions and labour into capital, which can in turn be used to generate added value (e.g. through accessing credit); enhance protection of rights; encourage productive investments; fetch higher prices for products; and minimise risks from forest law enforcement.	A few studies (mostly case studies) in the forest sector in the tropics have focused explicitly on the relationship between formalisation and poverty alleviation.	Mixed results, as formalisation alone does not guarantee success of enterprises. Some formalisation efforts have further marginalised poor small-scale workers; others have improved access to credit and markets, and have supported social projects.
Modifying/simplifying regulatory frameworks, including management plans	Overly burdensome regulations keep the forest-reliant poor from engaging in formal forestry sector. Simplified management plans can make it easier for them to engage and benefit from formal activities.	A few case studies in Latin America and Africa have examined the effects of simplified forest management plans on poverty, but none have attempted to empirically disentangle the effects of simplified management plans on poverty from the effects of other factors (such as tenure reform, market access and other barriers to SMFEs).	Mixed results. One study found that simplified management plans brought financial benefits to some communities, but did not compare the effects of simplified plans relative to non-simplified plans. Many studies continue to point to the difficulties associated with overly bureaucratic and technical processes to participate in the formal sector.
Log export bans (LEBs)	Log export bans are put in place to enhance domestic forest industries and thus domestic employment.	Empirical studies and economic models have examined the effects of LEBs on domestic processing and employment. One study specifically modelled effects on households in poverty.	Empirical and economic models have found no evidence that LEBs target the poor, or increase overall employment in the country. One model indicated that a LEB in Indonesia would result in decreased incomes across agricultural and rural households.
Procurement policies	Sourcing legal timber in international trade has resulted in bilateral trade agreements that have pushed for domestic governance reform – an opportunity for pro-poor policy reforms. Domestic procurement policies can also favour small scale or community-owned forest businesses.	No studies have effectively traced the effects of bilateral or international agreements on poverty reduction. We found one case study of a domestic procurement policy enhancing community forestry.	Authors have pointed to negative effects of international procurement policies affecting small-scale producers. There are cases showing improved small-scale production with domestic procurement policies that purchase from community forests, but specific links to poverty were not examined.

LEVER	THEORY OF CHANGE	SUMMARY OF THE EVIDENCE: QUANTITY AND TYPE OF STUDIES	SUMMARY OF THE EVIDENCE: CONCLUSIONS
Market and supply-chain levers			
<p>Payments for Ecosystem Services (PES) programmes</p>	<p>Payments for ecosystem services are expected to either have no impact on poverty (if they exactly compensate for lost profits from forgone environmental activities) or increase incomes.</p>	<p>A number of large-scale, rigorously designed studies.</p>	<p>Small positive impacts on household incomes or assets. One study found a small but significant decrease in poverty in a PES programme in Mexico. Evidence of positive contributions to food security. Where there is annual income variation, timing payments to the moment when incomes are lowest may generate important impacts on poverty.</p>
<p>Reducing Emissions from Deforestation and forest Degradation (REDD+)</p>	<p>REDD+ initiatives provide monetary compensation in exchange for reductions in terrestrial emissions through fostering conservation, sustainable management of forests and enhancement of forest carbon stocks. REDD+ initiatives may influence poverty via two pathways: 1) through REDD+ payments to governments and local bodies and benefit sharing of such payments, and 2) as a result of changes in forest benefits to local users and governments as they limit use of forests to conform to REDD+ objectives.</p>	<p>No comprehensive and rigorous assessments of the effects of REDD+ on poverty but several localised case studies, comparative analyses and reviews.</p>	<p>Two comprehensive reviews showed small or insignificant REDD+ contributions to income across cases. Case studies are mixed, with many showing small increases in incomes (at least in the short term), and others showing increasing inequalities in communities following REDD+. One quasi-experimental study found negative effects on well-being. Local tenure security was enhanced in many cases.</p>
<p>Ecotourism</p>	<p>Ecotourism can contribute to poverty reduction in four different ways: 1) improvements in employment and wages of those who find employment, 2) visitor fees for forested locations in protected areas, 3) revenues from visitor purchases of local goods and services, and 4) infrastructure development with spillover effects in areas with high numbers of travellers and visitors.</p>	<p>Estimates of its economic contributions to national economies and some local communities are available, but not specific to poorer groups. Evidence tracked through number of visitors and their effects on local and national economies. Thousands of case studies at the local level.</p>	<p>Case studies have focused on measures of development and poverty-related impacts in terms of generation of local jobs and incomes. A number of studies have examined local effects of ecotourism and point to positive outcomes in relation to livelihoods, socio-economic development, and poverty reduction. Many studies suggest that those who are better off will be more likely to benefit, exacerbating local income inequalities.</p>
<p>Small & medium forest enterprises (SMFEs)</p>	<p>SMFEs generate local employment opportunities in rural areas and spread wealth locally.</p>	<p>Many case studies showing their positive contributions to local prosperity but few impact assessments linking SMFEs directly to poverty reduction.</p>	<p>Difficult to isolate evidence of impacts of the presence of SMFEs, as a number of other levers are relevant to creating an appropriate enabling environment for SMFEs to thrive.</p>
<p>Market access</p>	<p>Enhanced market participation can lead to positive impacts on household income and poverty alleviation.</p>	<p>Primarily case studies.</p>	<p>Mixed and context-dependent evidence that this lever reduces poverty, due to the number of additional factors at play in producers' ability to make use of enhanced market access.</p>

<p>Forest producer organisations</p>	<p>Producer organisations can help forest producers overcome a number of challenges they face in deriving economic benefits from forests (including market access, technical services and information, and collective bargaining).</p>	<p>A large number of case studies, both econometric and qualitative.</p>	<p>Several studies show that producers who were members of a larger organisation or cooperative had higher incomes than non-members.</p>
<p>Company-community partnerships</p>	<p>Partnerships provide leverage for local forest communities to enter capital-intensive timber production or better access markets, potentially improving incomes and net returns from land and labour.</p>	<p>Despite many examples of CCPs, only a few case studies have carefully examined the explicit impacts of company-community contracts on poverty alleviation.</p>	<p>Mixed results. Some partnerships resulted in increased incomes and employment and improvement to social infrastructure. Other, poorly negotiated contracts, resulted in greater inequities, dependency and other negative effects.</p>
<p>Contract production</p>	<p>Contracts between producers and processing or marketing companies help poor producers overcome many market and technical barriers, potentially translating into higher incomes and more resilient livelihoods.</p>	<p>Mostly case studies of particular contracting relations. Some quasi-experimental studies on tree crops. Most studies of timber were largely qualitative, published as grey literature, relied on descriptive statistics, and/or failed to consider counterfactuals.</p>	<p>Considerable evidence of positive effects with agricultural tree crops. Less evidence with respect to timber or NTFPs. Some evidence that contract production can exacerbate social differentiation.</p>
<p>Certification</p>	<p>Certified products are expected to either fetch a higher price or help producers to reach dedicated markets. Adoption of practices prescribed by certification standards may improve productivity and reduce production risks.</p>	<p>Mostly case studies. Many studies are grey literature, with unclear methods and analytical rigour. Few studies on certified community forest management conform with standards for impact assessment.</p>	<p>There is no robust evidence that certification has reduced poverty, particularly because of the difficulties that small-scale producers have in acquiring and maintaining certification. Some evidence of improved income and well-being from cacao certification.</p>
<p>Zero deforestation commitments</p>	<p>Zero deforestation commitments frequently include guarantees to improve a company's conduct towards various groups of people, including indigenous and other forest-dependent people who live in and around forests used for commodity production; labourers employed by commodity-producing or processing companies; and smallholders who produce commodities and sell them into larger supply chains. Therefore, if companies that adopt zero deforestation commitments honour their pledges, then poverty may be reduced in one or more ways.</p>	<p>No evidence.</p>	<p>We found no evidence that supply-chain commitments have reduced poverty or improved human well-being.</p>
<p>Boycotts</p>	<p>Coordinated consumer action can hurt the profitability of a company, nudging it to adopt more sustainable production practices for timber, including social standards with potential poverty reduction ramifications (e.g. adoption of FSC standards).</p>	<p>No evidence.</p>	<p>Some suggestion that boycotts led to wider adoption of FSC certification. Impacts on poverty depend on whether FSC certification in turn has led to poverty reduction.</p>

LEVER	THEORY OF CHANGE	SUMMARY OF THE EVIDENCE: QUANTITY AND TYPE OF STUDIES	SUMMARY OF THE EVIDENCE: CONCLUSIONS
Forest and tree management levers			
Agroforestry	Agroforestry and tree planting can deliver additional income directly through sale of tree products or indirectly through increasing crop and livestock productivity, PES, and value-adding certification systems.	Many studies available on contributions to incomes, food security; some impact assessments with high risk of bias; very limited randomised control trials; and several studies using non-randomised regression analysis.	Several studies show that with extension and training, agroforestry adoption can lead to increased yields, household income, food security and dietary diversity, and tree planting can lead to diversifying incomes and improving livelihoods. A few studies have found that agroforestry programmes are associated with significant poverty reduction.
Forest restoration, reforestation and afforestation	Restoration, reforestation or afforestation can reduce poverty through transfer of payments for tree planting activities, PES, improvements in forests goods and services, securing tenure rights and trainings.	Multiple case studies. Few studies with robust counterfactual analysis.	Evidence shows that forest restoration, reforestation or afforestation can result in short-term livelihood benefits from direct involvement in tree planting (e.g. via payments and increased asset ownership). There is little evidence that livelihood benefits from services provided by restored forests meaningfully benefit proximate households to alleviate poverty.

5.3 Rights-based Levers

Rights-based levers tend to be developed and implemented by local, sub-national or national governments, with their implementation often supported by civil society actors. We review different types of tenure reform, community forest management, concessions, and protected areas, and examine the evidence that these levers have demonstrably affected poverty.

5.3.1 Tenure and property rights reform

Tenure can be defined as any arrangement that allocates rights to those who hold land and may also establish conditions for access and use of natural resources (FAO, 2011). Tenure may also be viewed as including a bundle of different property rights (Schlager and Ostrom, 1992; Galik and Jagger, 2015; Sikor *et al.*, 2017) with a combination of rights and responsibilities assigned to individuals or groups, permanently or temporarily, exclusively or not, to land or resources on that land (Bromley and Cernea, 1989; Bromley, 1992; Pacheco *et al.*, 2009; FAO, 2011; Cronkleton *et al.*, 2012). The bundle of rights comprises access, withdrawal, management, alteration, exclusion and alienation rights (Schlager and Ostrom, 1992; Galik and Jagger, 2015). Tenure reforms and forest property rights interventions can include a devolution of one or more of these rights to households, communities or other actors, as well as activities such as individual or collective land titling, tenure administration (such as cadastral or other recordkeeping), dispute resolution and enforcement relating to property rights and their security or redistributive land reforms (Miller *et al.*, 2020). Also of importance to *forest-reliant* people is tree tenure reform, and the devolution of the accompanying bundle of rights related to trees and tree products, which in some countries is considered separately from land tenure (where a person or community has ownership of land but not the naturally occurring trees on that land – Fortman, 1985).

In the context of poverty alleviation, the formal recognition and allocation of these rights to local communities and other *forest-dependent* people is expected to improve their livelihoods and well-being through secured access to resources, enable investments as a result of increased tenure security and, as a consequence, reduce poverty and *inequality* (Deininger, 2003; Meinzen-Dick, 2009; Lawry *et al.*, 2017; Miller *et al.*, 2019). Hence, SDG 1, target 1.4 aims to “ensure that all men and women, in particular the poor and the vulnerable, have equal rights to [...] ownership and control over land and

other forms of property, inheritance, natural resources [...]”

The proportion of forests with secure tenure rights for local communities and other forest dependent people is currently considered a thematic metric of forests’ role in ensuring equal rights to economic resources for all (FAO, 2018). Tenure reforms here range from partial devolution of forest management rights to local communities resulting in co-management systems (e.g. Senegal) to strong management and exclusion rights empowering local community forest organisations (e.g. Mexico), to formal titling of Indigenous territories (e.g. Peru). Currently, approximately 15.3% of forests worldwide, and approximately 28% of forests in *low- and middle-income countries* (LMICs), are formally owned or managed by Indigenous peoples and local communities (RRI, 2018). Yet it is estimated that Indigenous peoples and local communities hold as much as 65% of the world’s land area under customary systems, only a fraction of which are formally recognised by governments (RRI, 2015).

Much of the literature on securing land rights has focused on environmental degradation, productivity and incomes in agricultural settings. A recent systematic review of this literature on the impacts of interventions to recognise individual/private land tenure on agricultural productivity showed substantial productivity and income gains, although these differed by region (Lawry *et al.*, 2017). In the context of forests, a systematic review of the impact of forest property rights interventions on poverty reported generally positive or mixed impacts on income consumption and capital, although quasi-experimental assessments in the review reported positive and negative impacts in equal proportions (Miller *et al.*, 2019). The review noted that most of the studies focused on the devolution of access and withdrawal rights to communities, and that interventions providing more limited rights are less likely to alleviate poverty than those devolving more extensive rights.

Impacts of reform of tree tenure outside forests are much less studied. In Ghana, where much of the studies on tree tenure focus and where naturally occurring trees remain under the purview of the government regardless of land ownership, several studies call for tree tenure reform to address loss of forests and trees on farms and to enhance related livelihoods (Acheampong and Marfo, 2011; Marfo *et al.*, 2012; Hajjar, 2015). There has been some progress in implementation of tree registration programmes and other rights documentation of planted trees, aiming to provide landowners and farmers with the security that they will be able to

benefit from the tree when it matures (Fisher *et al.*, 2012; Sullivan *et al.*, 2018), but poverty impacts of such programmes have yet to be adequately measured.

Overall, the available evidence shows that tenure reform can play a role in poverty reduction, but that it seems to work best when combined with other *policy instruments* (Carter, 2003; Werner and Kruger, 2007; Meinzen-Dick, 2009; Shyamsundar *et al.*, 2020). Hence, the effectiveness of tenure reform is enhanced by interventions on access to justice and the rule of law, enforcement of property rights, technical support, and access to finance and basic infrastructure, e.g. water, electricity, roads, communications, schools, and healthcare (Werner and Kruger, 2007; Prosterman *et al.*, 2009; Meinzen-Dick, 2009; Akinola and Wissink, 2019; Gabay and Rekola 2019). Indeed, tenure reform, including devolution of forest rights and enhancing tenure security, is often a necessary but not sufficient enabling factor for the successful implementation of several levers discussed in this chapter.

The available evidence of the impacts of land tenure reform on vulnerable groups is variable and less promising. Tenure reforms have increased conflicts and tension between communal and individual rights, commodification of land subjecting it to market forces, and elite capture of benefits, as well as having limited benefits for women and Indigenous peoples (Benjaminsen *et al.*, 2008; Prosterman *et al.*, 2009; Okuro, 2011; Akinola and Wissink, 2019). Smallholders lacking requisite social and financial capital have great difficulty in registering trees to claim tenure over them (Johnson Gaither *et al.*, 2019). Even in studies that reported positive outcomes of tenure, many noted that wealthier households, better educated individuals, or men benefited more from tenure reforms (Miller *et al.*, 2020). In 30 of the most forested LMICs, over 50% have laws protecting women's property rights, but for community tenure regimes, only 29% protect women's membership, 10% protect inheritance rights and 3% their right to vote (Bose, 2011; Monterroso *et al.*, 2019). More work is necessary to protect and enforce women's tenure and access rights as women are still left behind (Prosterman *et al.*, 2009; Bose, 2011; Monterroso *et al.*, 2019; Gabay and Rekola, 2019).

5.3.2 Community forest management interventions

Community forests, or forest commons, are “forests used in common by a large number of heterogeneous users... [who] have a stake in good governance... [that] central governments formally or

informally recognize” (Chhatre and Agrawal, 2008). Such forests constitute more than 18% of the global forest area and make important contributions to carbon sequestration, biodiversity conservation and livelihoods (Agrawal *et al.* 2008). Their management historically predates more centralised forms of forest *governance*. But the postcolonial version of community forest management (CFM) has become a key instrument of forest policies since the late 1970s. Community forestry is now one among several strategies of forest management on which governments rely throughout the world for achieving dual objectives of forest conservation and livelihood improvement.

In recognising the rights of local user groups to manage common forest resources, it is expected that users will benefit directly and indirectly from forest products and services for subsistence and commercial purposes. However, the ecological diversity of forest commons, the institutional diversity of their forms of management, the variable national and local market and policy contexts in which they exist, and the wide range of benefits and ecosystem services that multi-functional community forests provide, have meant that there are few reliable national level assessments of the contributions of community forests to poverty alleviation. Such assessments are especially difficult because many of the benefits community forests provide are not sold in markets but harvested directly by users. It is therefore difficult both to quantify them and to price them.

At the same time, the role of community forests in providing subsistence, livelihood and commercial benefits to users has been a core focus of research for more than two decades (Antinori and Bray, 2005; Anderson *et al.*, 2006; Bray *et al.*, 2006; Ali and Behera, 2015). There is thus a wealth of both case literature and reviews of research on community forestry. This literature enables some generalisations, despite patchiness in country and regional coverage, about whether, how and to what extent CFM improves well-being.

Much case study evidence points to clear material benefits from community forest management for the poor (Thoms, 2008; Beauchamp and Ingram, 2011). McDougall *et al.* (2013) show that community forests in Nepal helped improve incomes, financial and forest assets, and employment. Reporting on findings from a multi-country study of forests and poverty, Jagger *et al.* (2014) suggested community forests do contribute in important ways to household incomes but less than do state-owned forests. In reviewing 40 years of community-based forestry, Gilmour (2016) states that there is much potential for CFM to produce benefits, but that the

Community forest management in Nepal

Nepal's Community Forestry Management (CFM) programme is considered one of the most successful of its kind in the world (Bijaya *et al.*, 2016). There are 19,361 Community Forest User Groups (CFUGs), which encompass 2.5 million households, managing 30% (~1.8 million ha) of the nation's forests (Government of Nepal, 2020). A CFUG has the management and use rights of the forest, but the community forest land ownership belongs to the state (Acharya, 2002; Thoms, 2008; Dahal, 2017). CFM has been touted as a means to improve both forest condition and local livelihoods, and has led to significant improvements in forest condition in Nepal (Gautam *et al.*, 2004; Nagendra *et al.*, 2008; Sunam and McCarthy, 2010; Shrestha and McManus, 2013; Bijaya *et al.*, 2016), with forest cover in Nepal increasing from 35% in 1985 to 44% in 2015 (Forest Research and Training Centre, 2019).

Community forest management has also alleviated poverty in Nepal (Oldekop *et al.*, 2019). Villages with CFM reduced the number of households living in poverty more than villages without CFM, between 2000 and 2012 (Oldekop *et al.*, 2019). Yet, benefits of CFM are unequally distributed among CFUG households. A ma-

majority of studies on CFM in Nepal have found that benefits to poor and low caste households are often much less than those to the well-off households in absolute terms (Adhikari *et al.*, 2004; Iversen *et al.*, 2006; Yadav *et al.*, 2015; Bijaya *et al.*, 2016). Poor and marginalised households are often more reliant on forests for livelihoods (Adhikari *et al.*, 2004; Chhetri *et al.*, 2016). Yet they often bear more costs both directly (e.g. contribution of time and labour for patrols) and indirectly (e.g. fewer livestock due to grazing controls) (Sunam and McCarthy, 2010; Parajuli *et al.*, 2015). CFM institutional arrangements often fail to effectively account for heterogeneity in power, socio-economic status and knowledge among forest resource users within CFUGs, allowing rich and elite members to exercise their power over poor and disadvantaged households (Sunam and McCarthy, 2010; Adhikari *et al.*, 2014). In sum, despite the success of CFM in Nepal in improving poverty outcomes, there is still much room for improvement, particularly with respect to equitable distribution of benefits and democratic engagement in decision making with poor and marginalised households.

potential has not yet been realised in most countries. In their recent authoritative review of available evidence on community forests examining 697 published cases of CFM, Hajjar *et al.* (2016) found that 68% of cases that reported on livelihood outcomes indicated that community or household incomes increased after CFM implementation.

Several reviews of community forest management have found the strength of evidence of the potential of CFM to generate welfare improvements as lacking. As Bowler *et al.* (2012) asserted, "poor study design, variable reporting of study methodology or context, and lack of common indicators make evidence synthesis difficult." In the systematic review of CFM referenced above, Hajjar *et al.* (2016) also showed that the available literature is characterised by a predominant focus on South Asian cases, qualitative analyses, and data and analytical gaps preventing generalisable conclusions about observed socio-economic and environmental outcomes of CFM.

Despite this, several recent studies have shown that community forests indeed provide material benefits to users (Chhatre and Agrawal, 2009; Persha *et al.*, 2011). In a rigorous analysis of 18,000 community forests in Nepal, Oldekop *et al.* (2019) show that CFM reduced both poverty and deforestation (Box 5.1). In a similar national-level analysis, Rasolofoson *et al.* (2017) found that CFM in Madagascar had a small but positive impact on household living standards, particularly for those closer to forests and with more education. Similarly, Santika *et al.* (2019) show that Indonesian village forests contributed to win-win outcomes and substantial economic benefits to the poor, but that the flow of poverty reduction benefits was linked to higher order variables related to land use classifications and zoning regulations. Studies such as these are beginning to create the knowledge and evidence base necessary to assess quantitatively the contributions of community forest management to poverty reduction at the national rather than the local scale.



Interviewing rural people to understand policy effects on their livelihoods and the environment

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5.3.3 Forest concessions

Under concessionary forest governance, central governments or their forest departments provide companies and communities with forest resource (typically timber) extraction rights in commercially valuable, government-owned forests in exchange for a stream of revenues (Agrawal *et al.*, 2008; Bulkan, 2014). The private concession model in forest governance has been in existence at least since the imperial trading period of the early 1700s and was implemented widely during colonial rule in countries such as Burma (now Myanmar), India, Indonesia and different parts of sub-Saharan Africa (Hardin, 2002; Hardin and Bahuchet, 2011). The largest concession areas occur in the cool temperate and boreal forests of Canada and Russia (FAO, 2018). But concessions also affected 20% of tropical forests in the 2000s, and most tropical timber is harvested through concessionary arrangements that vary in details across countries (Asner *et al.*, 2009). Concessions enabled the extraction of 270 million cubic metres of tropical timber (ITTO, 2015) valued at more than USD 7 billion in 2015 (Pearson *et al.*, 2018), with the FAO estimating the export value of timber from tropical countries to be in excess of USD 10 billion annually (Kishor and Damania, 2007).

A variety of logging concession arrangements exist including community concessions in Central

America (Gretzinger, 1998; Taylor, 2010). Private and corporate forest concessions are the dominant form of forest governance in tropical forests in Southeast Asia, parts of the Amazon, and especially in Central and West Africa (World Bank, 2002a), covering at least 75 million hectares of forests (Agrawal *et al.*, 2008; Banerjee *et al.*, 2009; Grut, 2010; Sodikoff, 2012). Commercial logging companies supply the capital and the technical expertise needed to undertake the different forms of planning and selective logging for forestry operations in remote, capital-poor contexts where harvestable timber exists. Governments provide the legitimacy and legal foundations for resource extraction that the companies need to undertake logging operations.

The most basic concession agreements specify the area of concession, the volume of timber extraction, and amounts and cadence of royalty payments to governments by concession holders, usually companies. Over time, concession agreements have evolved in many countries to include provisions for local public goods in the form of employment, schooling and basic healthcare for communities near logging concessions (van Hensbergen, 2016).

The concession form is vulnerable to corruption at all stages of its development and implementation (Kishor and Damania, 2007). Poor enforcement and price variations mean that tropical

country governments lose vast sums in revenues and as value addition to their national income. The World Bank estimates that poor countries lose upwards of USD 5 billion because of illegal logging (World Bank, 2002b). Illegal revenues also fuel armed conflicts and military challenges to incumbent governments, leading to political instability and violence against community members living near concessions (Le Billon, 2001; Davis, 2005; Kishor and Damania, 2007). Sustainability certification (Section 5.5.9) and improved enforcement are among the instruments national and international decision-makers have used to try to improve forest concession outcomes, including: lower levels of logging, sustainable forest management, improved local incomes and increased revenue streams to national governments (Ebeling and Yasué, 2009). National and international forest sector reform efforts (Section 5.4) seek to improve governance, reduce corruption and control illegal logging, but these efforts have achieved only sporadic and patchy success.

Concessions generate substantial income through timber harvesting and trade, particularly for logging companies (Ross, 2001; Medjibe and Putz, 2012; Straumann, 2014). Aggregate estimates of the value generated through concessions are available for the formal sector. But the contributions of concessions to local incomes and poverty alleviation are only documented for specific locations through case studies. Part of the reason is that economic contributions of forest concessions can be direct – through employment, income and service provision, but also indirect – through improved road connectivity, sales of goods and services to concession employees, and agricultural production.

Assessments of contributions of forest concessions to local incomes and poverty alleviation vary by space and in time. In a recent study, Jung *et al.* (2019) used nationally representative panel data to estimate that the wealth score (based on asset holding) of those living close to forest concessions in Liberia improved by 10% or more compared to the assets of those farther away from concessions, likely as a result of indirect effects on agricultural output. Lescuyer *et al.* (2012) found a similar effect of forest concessions in two communities in eastern Cameroon. In another study focusing on Gabon and concerning 17 communities around two forest concessions, Iponga *et al.* (2018) found minimal contributions to livelihoods from the non-timber forest product gathering activities of local residents. In general, it is difficult to escape the conclusion that writings on forest concessions provide only limited evidence of their contribu-

tions to poverty reduction even as concessions generate substantial benefits and profits for large logging companies (Scudder *et al.*, 2019).

5.3.4 Protected areas

Protected areas (PAs) are, in theory, clearly defined geographical spaces, recognised, dedicated and managed to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN, 2008). They are a popular policy instrument in the global fight against loss of biodiversity and ecosystem services (Hanauer and Canavire-Bacarreza, 2015).

Protected areas are a global phenomenon covering just under 15% of the world's terrestrial surface and inland waters (UNEP-WCMC and IUCN, 2016), with countries committing to increasing this to 17% by 2020 (Schleicher *et al.*, 2019). The first formally-recognised national park (Yellowstone National Park in the U.S.) was established in 1872. Yet, community-protected areas have existed since ancient times and globally their land surface equals that of official reserves (Muench and Martínez-Ramos, 2016).

The International Union for Conservation of Nature (IUCN) classifies PAs according to their management objectives, ranging from strictly protected nature reserves and national parks, to community conserved areas and those areas allowing sustainable use of natural resources (Dudley, 2008). Depending on this classification, PAs can support poverty reduction by securing the rights of people to land and valuable natural resources, supplying ecosystem services, generating economic benefits including through ecotourism (see Section 5.5.3) and improving infrastructure in remote areas (Andam *et al.*, 2010; Brockington and Wilkie, 2015). However, there is also a large evidence base showing that people have been displaced or denied access to resources by the establishment of parks and reserves, threatening peoples' rights and livelihoods (Brockington and Wilkie, 2015). Indeed, the establishment and management of many national parks are often reflective of forest conservation, a top-down protectionist approach to park management (Bruner *et al.*, 2001). These are envisaged as places where rural livelihoods do not belong (Brockington *et al.*, 2006), human habitation is often excluded through the forced removal of local and Indigenous people (Magome and Murombedzi, 2003) and nature is seen to be preserved as 'wilderness' (Colchester, 2004). Human-induced pressures on PAs and the conflict between biodiversity conservation and the needs of local people are predicted to increase

due to numerous factors, including disputes over traditional territorial claims, land-grabbing by the landless or industrial-scale commodity producers, forced evictions, market forces, and a reduction in distance between PAs and human population centres (Brockington and Wilkie, 2015; Oldekop *et al.*, 2016).

Several studies provide strong evidence that PAs can reduce poverty. Using poverty measures based on national census data in Costa Rica and a poverty index in Thailand, one study found that the net impact of *ecosystem* protection was to alleviate poverty in both nations (Andam *et al.* 2010). However, not all segments, sub-districts or poor households experienced poverty alleviation from PAs (Andam *et al.*, 2010). Applying a quasi-experimental research design to data collected by Andam *et al.* (2008; 2010) in Costa Rica and Thailand, another study assessed the heterogeneity of PA impacts on poverty reduction, finding that PAs in areas associated with high poverty did, on average, reduce poverty while also reducing deforestation (Ferraro *et al.*, 2011). However, a quasi-experimental, panel study of three PAs in Cambodia found limited impact on poverty of households within the PAs as compared to their matched controls (Clements and Milner-Gulland, 2015). Another study using matching methods found an overall negative PA impact on household wealth in China (Duan and Wen, 2017).

Several studies provide evidence of trade-offs across the landscape and support for the simple theory that the opportunity cost of land has significant moderating effects on the impacts of PAs (Hanauer and Canavire-Bacarreza, 2015). Using quasi-experimental methods, Hanauer and Canavire-Bacarreza (2015) found that the biophysical characteristics associated with the most avoided deforestation were the characteristics associated with the least poverty alleviation in Bolivian cases; that is, the same characteristics that may have improved the social welfare impacts of study PAs may also limit their conservation effectiveness (e.g. PAs on lands that are highly suitable for agriculture, far from major cities and infrastructure, or where a high percentage of adults are employed in agriculture) (Ferraro *et al.*, 2011). Win-win outcomes were most commonly associated with locations at intermediate distances from major cities (40-80km) and on land of moderate to poor agricultural potential (Ferraro *et al.*, 2011). Similarly, Sims (2010) found that the largest positive socio-economic impacts from tourism in PAs in Thailand occurred at intermediate distances from major cities. Another study using data from 190,000 households across 34 countries found that households near PAs with

tourism had higher wealth levels and a lower likelihood of poverty (by 16%) than similar households living far from PAs (Naidoo *et al.*, 2019). In explaining heterogeneous impacts of PAs, a meta-analysis found that PAs that integrated local people as stakeholders and sought to empower them tended to be more effective at achieving both positive conservation and socio-economic outcomes (Oldekop *et al.*, 2016).

While the science of PA mechanisms is still at a fledgling stage (Ferraro and Pressey, 2015; Hanauer and Canavire-Bacarreza, 2015), there is a growing empirical evidence base documenting whether, and by how much, PAs affect the environment and human welfare (Ferraro and Hanauer, 2014; Borner *et al.*, 2020). Though it faces a diversity of challenges, the global network of PAs will likely remain a key option for maintaining and enhancing biodiversity conservation, hence the potential of protected areas for exacerbating or alleviating poverty will need to be monitored. Given recent proposals to protect half of the earth (Dinerstein *et al.*, 2017; 2019) determining impacts is critical (Schleicher *et al.*, 2019), and the use of impact evaluation techniques using rigorous, quantitative methods to infer causality from non-experimental data is becoming the norm in this domain (Ferraro and Pressey, 2015).

5.4 Regulatory Levers

Although rights-based interventions (considered above) are a form of regulatory lever, in this section, we review other levers that are principally oriented around laws, policies, and regulations that determine how forests and trees are managed, used, conserved and/or restored. Regulatory levers tend to be developed and implemented by local, sub-national or national governments. We review decriminalisation and formalisation of informal operations, modification or simplification of regulatory frameworks, log export bans and procurement policies, and examine the evidence that these levers have demonstrably affected poverty.

5.4.1 Decriminalisation and formalisation of informal operations

The informal forestry sector (unincorporated enterprises that may also be unregistered and/or small – Lewis, 2016) is estimated to employ 45-50 million people worldwide, compared to 13 million employed in the formal forestry sector (FAO, 2014). Informality does not necessarily equate to dealing in illegal goods or purposefully evading regulations. Indeed, the vast majority of informal

workers are working poor, for whom existing regulations are simply irrelevant or inappropriate (Kaimowitz, 2003; Lewis, 2016). Informality in the forest sector then encompasses various ‘shades’ of illegality, ranging from unlicensed collection of forest products or charcoal production to harvesting and trading protected species. Importantly, the degree of illegality can vary significantly depending on national legislation (Weng, 2015). Formalisation in the context of the forest sector has been defined in a number of different ways, often focusing on the formal process of identifying, codifying and registering the rights to access, own or trade land and forest resources (e.g. Meinzen-Dick and Mwangi, 2009; Putzel *et al.*, 2015; Kelly and Peluso, 2015), or on enhancing the degree to which supply networks are controlled by official and explicit rules and institutions (Choi and Hong, 2002; Schure *et al.*, 2013) and the extent to which producers engage with them (Erbaugh *et al.*, 2016).

Formalisation can be a way of allowing the poor to convert their possessions and labour into capital, which in turn can be used to generate added value (e.g. through accessing credit) (de Soto, 2000). In addition, formalisation can benefit producers through enhancing the protection of rights (Chen, 2007), encouraging productive investments (Hirons *et al.*, 2018), reducing incentives for corruption (Zulu and Richardson, 2012), allowing producers to fetch higher prices for products on formal markets, and keeping producers out of law enforcement trouble and having equipment confiscated (Hajjar *et al.*, 2011). Yet, formalisation in the forest sector is rarely implemented with poverty alleviation as the sole or primary objective (Lele *et al.*, 2010; McDermott, 2014; Putzel *et al.*, 2015). Recent years have witnessed a particular interest in curbing informality – often wrongly equated with illegality – as a way to also enhance legality and sustainability.

Few studies in the forest sector in the tropics have focused explicitly on the relationship between formalisation and poverty alleviation. To date, fully formalised, small-scale forest product value chains are not yet mainstream in national or regional economies (Lewis, 2016; Doggart and Meshack, 2017). This is because poor, small-scale value chain actors struggle to comply with costly and complex formal regulations (Kaimowitz, 2012; Obidzinski *et al.*, 2014; see Section 5.4.2) that are often poorly adapted to their needs (Hansen and Treue, 2008). In many instances, various types of formalisation efforts in the forest sector have excluded and marginalised poor small-scale workers (Anderson and Pacheco, 2006), criminalised legitimate but informal livelihoods (Hansen and

Treue, 2008; Purnomo *et al.*, 2009; Cerutti *et al.*, 2013; Hirons *et al.*, 2018), reduced incomes (Chen, 2007; Wynberg *et al.*, 2015), limited access rights to key commodities (Anderson *et al.* 2018), as well as increased elite capture and exploitation by more powerful actors (Lele *et al.*, 2010; Ndoye and Awono, 2010; Schure *et al.*, 2013; Weng and Putzel, 2017).

In contrast, Cerutti *et al.* (2019) found that some small and medium-sized forest enterprises registered within the national forestry licensing scheme (SVLK) in Indonesia reportedly found easier access to formal financial credit than they used to find when they operated in the informal sector, with improved access to the international market (Cerutti *et al.*, 2019). Schure *et al.* (2013) suggested that taxes generated through formalised and decentralised woodfuel chain governance in Central and West Africa had been reinvested in local social projects, while Hautdider and Gautier (2005) found that woodcutters in Mali benefitted from formalisation through harvesting quotas, formally allocated selling points, and improved oversight. However, implementation of forest commodity regulations is often weak and may incentivise corruption as well as free-riding (Schure *et al.*, 2013). In Mozambique, Jones *et al.* (2016) found that the lax enforcement of formal regulations in the charcoal sector was in fact critical to enabling the participation of small-scale producers – and especially women – participating on a casual basis.

When costs are perceived to outweigh benefits, Obidzinski *et al.* (2014) found evidence of Indonesian producers opting not to renew SVLK certificates. Recognising the potential social pitfalls of formalisation, recent discourses tend to emphasise various safeguards and complementary measures aimed at more inclusive and socially sustainable formalisation. Such measures may include decentralising land and resource governance (Putzel *et al.*, 2015), promoting cooperatives/producer organisations (Tilahun *et al.*, 2016) or simplifying regulations (Lewis, 2016). These levers and their impacts on poverty are assessed elsewhere in this chapter (see especially Sections 5.3.1., 5.4.2. and 5.5.6).

5.4.2 Modifying or simplifying regulatory frameworks

Among the oft cited barriers preventing communities and smallholders from engaging in the formal forestry sector are overly bureaucratic and technical processes in completing forest management plans, obtaining permits and other legal documents, and complying with burdensome regulations that were largely designed for a forest sector dominated by large companies (Medina

et al., 2008). As such, one proposed solution has been to require simplified management plans that are easier to complete by smallholders and communities, with the intention of bringing their forest activities into the formal sector. In having the necessary legal documentation, these actors could theoretically better access markets for their products and fetch higher prices than they would obtain on informal markets. They would also be less at risk of being fined or jailed for illegal activities (Hajjar et al., 2011). This lever would likely be one of several regulatory changes needed to enhance the ability of small-scale forest enterprises to contribute to poverty alleviation (Badini et al., 2018).

While it is not clear how widespread regulatory changes have been, a handful of studies in Latin America and Africa have examined the effects of simplified forest management plans on poverty. Forestry laws modified in the mid-1990s and 2000s in Bolivia and Ecuador allowed for a number of special regulations for small-scale management, simplifying the requirements for obtaining permits or plans so that they were less costly to prepare and implement or, as in the case of Beni province in Bolivia, allowing smallholders to extract timber without a management plan at all if they needed the income to buy basic goods (de Koning, 2011; Pacheco, 2012). Yet, the regulations still proved to be barriers for smallholders, requiring inputs and technologies. Often the benefits from following the law did not outweigh the costs, resulting in many smallholders continuing to participate in informal markets (Pacheco, 2012). In Cameroon, one study found that simplified management plans brought financial benefits to some communities, but the study did not compare the effects of simplified plans relative to non-simplified plans (Bruggeman et al., 2015). In an ex-ante study, Sanogo et al. (2014) predicted simplified management plans in Senegal would only have a small impact on local development when considering small management areas.

In summary, to date no study has attempted to empirically disentangle the effects of simplified management plans on poverty from the effects of other factors (such as tenure reform, market access and other barriers to SMFEs), but many continue to point to the difficulties associated with overly bureaucratic and technical processes to participate in the formal sector.

5.4.3 Log export bans

Export bans (or high export taxes) for unprocessed log timber have been implemented in many countries (predominantly in low- and middle-income

countries, but also in some high-income countries) to counter deforestation and environmental degradation associated with the timber trade and/or to induce development of a domestic processing industry. Effectively an export tax and input subsidy to domestic processing (Dean, 1995), these bans were expected to increase employment and value-added in a nation's forestry sector by increasing the overall domestic processing of logs. A number of countries in Southeast Asia, Africa and Latin America enacted such export bans, primarily during the 1970s, 80s, and 90s (Goodland and Daly, 1996), and in some cases, enacted them more than once (Resosudarmo and Yusuf, 2006). The costs and benefits of log export bans (LEBs) on both welfare and environmental resources have been debated extensively (Goodland and Daly, 1996; Kishor et al., 2002; Resosudarmo and Yusuf, 2006; Tumaneng-Diete et al., 2005). While some empirical studies and economic models indicated that export bans have indeed increased domestic processing capacity, exports of secondary processed wood products and employment in the domestic processing sector (reviewed in Goodland and Daly, 1996), a number of models show that the increased employment in the processing sector does not compensate for the number of jobs lost in logging operations following LEB policies (Resosudarmo and Yusuf, 2006). Gillis (1988) estimated that Indonesia lost millions of dollars by banning log exports. We found one study that specifically modelled the effects of an LEB on households in poverty, showing that an LEB in Indonesia would result in decreased incomes across agricultural and rural households, at least in the short run (Resosudarmo and Yusuf, 2006).

5.4.4 Procurement policies

Timber procurement policies aim to ensure that timber is coming from legal and/or sustainable sources. They have been implemented at the domestic level, where governments wish to source timber for public works from legal sources, or internationally, to ensure that timber being imported into a country is sourced legally (such as the EUTR or US Lacey Act). A particularly prominent international intervention in this realm has been the Voluntary Partnership Agreements (VPA) of the EU's Forest Law Enforcement, Governance and Trade Programme, which are bilateral trade agreements between 15 countries and the European Union that include a series of governance reforms in the exporting country to ensure that timber being imported into the EU comes from legal sources. Some argue that the opportunities

for domestic governance reform and opening of the political process that the VPA presents can be used by civil society to ensure pro-poor policy reforms such as strengthening land tenure and access rights for marginalised rural communities and Indigenous peoples (Hobley and Buchy, 2013; Richards and Hobley, 2016; Tegegne *et al.*, 2017). Yet, we did not find evidence suggesting that this pathway has resulted in poverty reduction or enhanced economic opportunities for the forest-reliant poor. Instead, some authors have pointed to potential negative effects of these legality policies on small-scale timber producers, particularly if they are required to bear the cost of implementation or if self-employed people in the informal sector are squeezed out, exacerbating poverty in forest-reliant communities (Eba'a Atyi *et al.*, 2013; Hajjar, 2015).

Alternatively, procurement policies can be used domestically to boost small-scale producers. For example, in Oaxaca, Mexico, the state government's policy regulating the purchasing of furniture for government institutions from community forests has boosted furniture production in three community forest enterprises (Tanaka, 2012).

5.5 Market and Supply Chain Levers

In this section, we review levers that are based on market mechanisms and whose success depends, at least in part, on commodification or commercialisation of trees, forest products or forest ecosystem services. Market and supply chain levers may be developed and implemented by governments, private sector bodies, or NGOs. Participation in such levers is generally voluntary. We review payments for ecosystem services, REDD+, ecotourism, small and medium forest enterprises, market access, forest producer organisations, company-community partnerships, contract production, certification, zero deforestation commitments and boycotts, and examine the evidence that these levers have demonstrably affected poverty.

5.5.1 Payments for ecosystem services

Programmes of payments for ecosystem services (PES) are conservation contracts intended to encourage environmentally favourable activities. The usual structure of these programmes is that willing participants offer to conserve a landscape (e.g. forest conservation), engage in a productive activity with a reduced ecological footprint (e.g. *agroforestry*), or restore ecological services (e.g. *reforestation*). Once these efforts are verified, participants receive payment (Wunder, 2015).

When they yield additional environmental benefits, PES programmes are expected to compensate participants for the value they forego by not carrying out the productive activity in which they were going to engage in the absence of the payments (Engel *et al.*, 2008). Theoretically, people should not accept payments that are less than this minimal opportunity cost. Therefore, it should be the case that PES payments either have no impact on poverty (if they exactly compensate for lost profits) or increase incomes (in the event that they exceed the amount of lost profits). Nonetheless, if households do not fully understand the mechanism or the benefits from deforestation, they could lose out from the transfer scheme. Here we examine whether rigorous studies with large numbers of observations show this to be the case. There are already a number of reviews of the impact of PES programmes on poverty (e.g. Bulte *et al.*, 2008; Lipper *et al.*, 2009; Palmer and Engel, 2009; Alix-Garcia and Wolff, 2014). Much early evidence came from Mexico and China, two countries with large existing PES-type programmes that started in the early 2000s. All estimations documented declines in, or no effect on, poverty.

New evidence from a broader range of countries supports the finding that PES programmes have either a small positive or neutral effect on poverty reduction. Two nationally-representative studies in Mexico showed small poverty reduction impacts that have decreased over time, probably due to the erosion of payment values from inflation. A combination of matching between accepted and rejected applicants and panel data approaches showed that beneficiaries experienced small increases in household assets that were greater in areas with lower deforestation risk (Alix-Garcia *et al.*, 2015). Sims and Alix-Garcia (2017) confirmed a small but significant decrease in poverty in Mexican PES-receiving localities from 2000-2010. Later work comparing beneficiaries to non-beneficiaries from 2011-2014 using a regression discontinuity approach showed zero impact on assets, food expenditures and housing characteristics (Alix-Garcia *et al.*, 2019). A smaller study (eight villages, 261 households) in southern Mexico comparing matched payment recipients and non-recipients (non-applicants) found positive impacts on household assets, but only where payments were large (Jones *et al.*, 2018). In Costa Rica, programme impacts estimated using matching (recipients to non-applicants) have generally revealed neutral effects despite the fact that payments are large (Robalino *et al.*, 2014; Arriagada *et al.*, 2015). The observation that programme recipients continue to re-enrol suggests that participation benefits

China's largest payment for ecosystem services programme

Following devastating natural disasters in the early 2000s believed to be caused by soil erosion from croplands on slopes of mountainsides, the Chinese government initiated the largest payments for ecosystem services programme in the world, the Conversion of Cropland to Forest Programme (CCFP) (China State Council, 2000). Also known as the Sloping Land Conversion Programme or the Grain for Green Programme, the CCFP enrolled farming households to convert their croplands on slopes to forests. In return, the government provided grain compensation to the farmers for the forests created on their cropland (Liu *et al.*, 2008), although the grain compensation was later replaced with cash. The secondary goal of the CCFP was poverty alleviation as most of the households who were eligible to participate in the programme live in poor regions of the country. The ecosystem services that the government buys from farmers are soil and water conservation. Farmers initially signed an eight-year agreement with the government for CCFP. After the initial contract ended, the Chinese government renewed the contract for another eight years, but at half of the initial compensation rate. In 2015, the

Chinese government started a second round of the CCFP.

A recent report released by the Chinese government (Xinhua News Agency, 2019) showed that the CCFP converted 13.27 million ha of cropland to forest or grass, enrolling 41 million households (158 million people) since 2001. The average compensation over the programme period is almost CNY 9,000 (USD 1,270) per household. In addition to the direct compensation, CCFP stimulated significant income structure change from farm work to off-farm employment (Song *et al.*, 2014; Rodriguez *et al.*, 2016) because CCFP freed farm labour, stimulating rural out-migration (Zhang *et al.*, 2018). Although the percent of cash compensation did not make up much of the total household income in general, it was a significant cash income for poor households (Song *et al.*, 2014). Additionally, farmers have several rights over the forests grown on their croplands, incentivising them to allow the forests to mature. The programme significantly increased forest coverage in China which is now providing ecosystem services such as carbon sequestration (Liu *et al.*, 2008).

likely exceed costs, but are not sufficient to induce detectable decreases in poverty.

A number of new studies have emerged in China and Vietnam. Using a selection model to compare participants to non-participants between 2008 and 2014, Phan *et al.* (2018) found a positive effect of PES on income growth. One caveat is that control households in the sample had significantly higher incomes than recipients in the baseline period. Treacy *et al.* (2018), using a difference-in-difference model, found a positive effect of the Sloping Lands Conversion Programme (SLCP) on migration in China and no impact on income. Using a matched panel of household data from 1996 to 2010, Liu and Lan (2018) estimated initial positive effects of the SLCP on agricultural productivity but this positive effect declined over time. One study examining the impacts of the SLCP on income between 1999 and 2006 found negative effects via a reduction in crop income (Yang *et al.*, 2018). However, these results should be taken with caution, as the data did

not include any non-recipient group to help identify counterfactual trends, and there was no mechanism to allow causal identification of impacts.

Finally, there has been substantial new work focused on the poverty alleviation effects of PES in Africa. Two quasi-experimental studies in Mozambique estimate neutral to positive effects on household income. Using difference-in-difference techniques to compare project and non-project villages revealed neutral impacts of a long-standing PES project on household income between 2001 and 2008 (Jindal *et al.*, 2012), while a matching analysis of PES versus non-PES households in the same project (but only in the year 2006) showed positive association with cash incomes and consumption expenditures (Hegde and Bull, 2011). The discrepancy between these two could be due to a combination of noise in the recall data used to create the difference in differences, the difference between comparisons of changes versus levels, and/or different survey instruments.

A conservative interpretation would be that payments in Mozambique did no harm to the incomes of participants. Two recent randomised control trials (RCTs) also provide evidence of short-term positive impacts on participant incomes. In Uganda, a PES RCT found small increases in non-food expenditures (Jayachandran *et al.*, 2017). A similar methodology applied in Burkina Faso suggested that the timing of payments may be important (Adjognon *et al.*, 2019); food expenditures of participants in a reforestation RCT increased by 12% and food insecurity decreased for payments timed to coincide with the lean season.

Overall, our understanding of PES anti-poverty impacts continues to evolve. There is no substantial evidence that such programmes hurt participants' incomes, nor is there extensive evidence of substantial positive effects on poverty. In some cases, PES has resulted in win-win outcomes for both the environment and programme participants. The studies examined do not always provide information on why there are positive impacts in some settings and not others. However, the simple framework that began this section would suggest that payment levels may currently be only just sufficient to compensate for the opportunity cost of engaging in PES contracts. Targeting payments to properties that have low opportunity cost but high risk of deforestation could increase poverty alleviation impacts without sacrificing conservation objectives. Finally, the most recent work suggests that where there is annual income variation, timing payments to the moment when incomes are lowest may generate important impacts on poverty by smoothing consumption.

5.5.2 REDD+

Policies, projects and other interventions related to Reducing Emissions from Deforestation and forest Degradation, and fostering conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) are among the more prominent attempts to mitigate climate change since 2010 (Parrotta *et al.*, 2012). Belonging to the broad family of payments for ecosystem services interventions, REDD+ initiatives provide monetary compensation in exchange for reductions in terrestrial greenhouse gas emissions in the forest sector. Early REDD+ interventions were primarily at the local scale with performance-linked payments made to local communities and households by international NGOs, voluntary market mechanisms, or in many cases through pilot schemes supported by bilateral donors or multilateral organisations. As countries

with forests have developed the capacity to implement REDD+ policies and monitor emissions reduction at the national scale, results-based payments to sub-national jurisdictions and countries are becoming more important (Maniatis *et al.*, 2019; Wunder *et al.*, 2020).

While the primary objective of REDD+ interventions is to reduce emissions, REDD+ may influence poverty via two pathways. The first is through REDD+ payments to governments and local bodies for verified emissions reductions or promises of emissions reductions, and benefit sharing of such payments, with adjustments for costs of adherence to REDD+ objectives (e.g. to monitor and enforce rules designed to limit emissions). The second is through changes in forest benefits to local users and governments as forests recover when users limit extraction of carbon-intensive products from forests to conform to REDD+ objectives. Such indirect effects may be positive in cases where forest recovery occurs and users are able to harvest non-carbon-intensive benefits such as fodder, foods or non-wood products. Restrictions on harvests may also turn out to be costly if they affect extraction of valuable timber or other carbon-intensive forest products such as firewood, or if local resource users are displaced (Beymer-Farris and Bassett, 2012). REDD+ safeguards have been widely adopted to protect against negative impacts on Indigenous and traditional forest-dependent people (UNFCCC, 2011).

We found no comprehensive and rigorous assessments of the effects of REDD+ on poverty or on consumption, incomes, asset building, education, health or other indicators of well-being. Although national level payments for avoided deforestation at scale have begun to flow, there are no analyses of how these payments have been shared with local populations and for what benefits, or how effectively recipient governments have used such payments to address poverty of stakeholders involved in reducing deforestation.

Two studies at the local level did not find evidence for effects of REDD+ on material indicators of well-being or poverty, and suggest that positive effects of REDD+ payments are possible, but have been modest at best (Danielsen *et al.*, 2011; Awono *et al.*, 2014). A study of benefit sharing for REDD+ in Nepal found that direct contributions of REDD+ projects to households' incomes were nominal – from 3.2% of income of poorest households to 0.3% of the income for the less poor households (Shrestha *et al.*, 2017). Payments had a small effect on inequality but also increased social tensions. Local incomes under the N'hambita Community Carbon Project in Mozambique were higher for

project participants, but primarily as a result of wage payments during the tree planting phase of the project. Annual carbon payments for agroforestry contracts were equivalent to about two months of wages (Groom and Palmer, 2012), but their study could not estimate whether incomes increased because of lack of baseline data. The permanence of payments was also unclear. The field experiment conducted by Jayachandran *et al.* (2017), although not a formal REDD+ intervention, found positive effects of payments on carbon outcomes, but statistically insignificant effects on incomes. Jagger and Rana's (2017) quasi-experimental analysis based on publicly available data for Indonesia found potentially negative effects on well-being in REDD+ sites.

A recent systematic review of REDD+ found 350 local-level projects in implementation across the tropics (Duchelle *et al.*, 2018). According to this review, no national level study of payments was available, and few existing studies of REDD+ projects provide careful causal estimates of carbon or non-carbon outcomes on the ground. The relatively more numerous studies of well-being outcomes "highlight small or insignificant results" (Duchelle *et al.*, 2018). In a review of 41 REDD+ projects across 22 countries that adhered to some reporting standards, Lawlor *et al.* (2013) found that participants received a wide range of payments (from USD 1 to USD 134 per year) and that contributions to infrastructure and education services were modest. The more important contribution of these projects was to local tenure security. Other studies have suggested that the effects of REDD+ may even be negative by adversely affecting local politics, institutions and livelihoods (Chomba *et al.*, 2016; Shrestha *et al.* 2017; Milne *et al.* 2019).

Overall, existing studies of REDD+ tend to focus on institutional structures, implementation procedures, relationships to past forest sector interventions and issues related to emissions reduction. A number of analyses have examined: a) how differing conditionality structures may affect emissions reduction outcomes (Irawan and Tacconi, 2009; Hoang *et al.*, 2013) and b) linkages from the local to the national and supranational levels (Bluffstone *et al.*, 2013; Kashwan and Holahan, 2014). But few studies, as discussed above, provide clear evidence on poverty outcomes of REDD+, in part because of the slow pace of national level implementation of REDD+ and subsequently because of unclear and complex benefit sharing structures. Because performance-based payments are only now beginning to supplant promise – or preparation-based payments for REDD+, it is difficult to attribute indirect REDD+ benefits from forest restoration or preserva-

tion of forests to local poverty reduction. Existing evidence on the effectiveness of REDD+ for poverty reduction is limited, but available analyses point to the critical importance of benefit sharing and stakeholder participation if REDD+ is to contribute to improvements in well-being either through direct transfers or indirectly.

5.5.3 Ecotourism

The tourism industry accounts for nearly 10% of the global economy (WTTC, 2019), and ecotourism is the fastest developing sector of the tourism industry. Much of the literature on ecotourism comprises case studies and reflections. These provide a range of perspectives on the value of ecotourism and different estimates of its contributions to national and local incomes. Defences and critiques of ecotourism both suggest that it is a promising route for generating material benefits for those living in proximity to tropical terrestrial and marine biodiversity.

Two common features of ecotourism are consistent across different definitions: it is a low impact form of tourism that helps conserve nature and it generates socio-economic benefits for local populations to help reduce poverty (Blangy and Wood, 1993; Buckley, 1994; Wunder, 2000). Ecotourism can contribute to poverty reduction in four different ways: 1) improvements in employment and wages of those employed; 2) shared visitor fees for forested locations in protected areas; 3) revenues from visitor purchases of local goods and services; and 4) infrastructure development with spillover effects in areas with high numbers of travellers and visitors. Typically, these benefits do not flow directly to the poor, but may be mediated through owners of hotels and restaurants, government agencies that receive protected area fees, and owners of businesses that sell goods and services to ecotourists. Further, ecotourism revenues result not just from the presence of forests and trees in protected areas but also from the presence of wildlife in forests.

Because ecotourism is such an important and growing part of tourism, estimates of its economic contribution, especially for national economies but in some cases for local communities as well, are widely available. One study on ecotourism used visits to protected areas in selected countries to estimate the total number of protected areas' visitors globally (Balmford *et al.*, 2015). Its estimate of ~8 billion visitors was associated with an amount of USD 600 billion per year in direct in-country expenditure and USD 250 billion per year in consumer surplus. These figures resemble other top down

estimates of total ecotourism revenues. WTTC estimates total direct and indirect contributions of tourism to the global economy at approximately USD 8.8 trillion per year and the share of ecotourism to be 10%, but growing at a faster pace compared to tourism. However, available statistics do not break down total spending by proportions for different social or economic groups.

Studies of ecotourism at the local level typically focus on measures of development and poverty-related impacts in terms of generation of local jobs and incomes, and in some cases the creation of new infrastructure (Snyman, 2012; Wishitemi *et al.*, 2015; Chirenje, 2017). Over the past three decades, thousands of case studies of ecotourism suggest that it contributes effectively both to local employment and incomes, but also that these contributions tend to benefit those who are better off and with the capacity to provide hospitality services to visitors. One example is a study of ecotourism around six Panda Reserves in China that found that ecotourism reduced poverty but increased income inequality, particularly for households residing within the reserves (Ma *et al.*, 2019). A number of other studies have similarly examined local effects of ecotourism and point to positive outcomes in relation to livelihoods, socio-economic development and poverty reduction (Simpson, 2012; Yi-Fong, 2012; Snyman, 2017; Lonn *et al.*, 2018).

5.5.4 Small and medium forest enterprises

Small and medium forest enterprises are small-scale forest-based businesses that generate income from a diversity of forest-related activities and products, including timber and fuelwood producers, carpentry shops, NTFP producers and ecotourism (Macqueen, 2008). Mayers *et al.* (2016) stated that about USD 125-130 billion of gross value-added may be contributed by SMFEs worldwide and 80-90% of all forestry enterprises in many countries are SMFEs. Employing at least 20 million people worldwide (FAO, 2013). SMFEs can play an important role in the reduction of poverty as they generate employment opportunities and spread wealth locally (Kozak, 2007; Tomaselli *et al.*, 2012; Sanchez Badini *et al.*, 2018). Positive evidence of this role comes from, *inter alia*, Bolivia, Brazil, Burkina Faso, Cameroon, China, The Gambia, Guatemala, Kenya, Mexico, Papua Guinea, Peru, Nepal and South Africa (Macqueen, 2008; Tomaselli *et al.*, 2012; Foundjem-Tita *et al.*, 2018). Among the factors that explain this role in poverty reduction, Kozak (2007) mentions that: i) SMFEs tend to be labour-intensive; ii) they may thrive and grow under favourable conditions; iii) they cater to local and domestic markets; iv) they empower local entrepreneurs; and v) they pursue other objectives that include the distribution



The transformation of forest products into consumer goods can support local economies (Oaxaca, Mexico)

Photo © Reem Hajjar

of earnings among stakeholders, the participation in policy dialogues and the contribution to community development. They also support decentralisation, tenure and access rights, and empowerment of vulnerable groups such as women and Indigenous communities (Sanchez Badini *et al.*, 2018). Yet, despite a strong theory of change and many case studies showing their positive contributions to local prosperity (Macqueen, 2008; Macqueen *et al.*, 2020), there have been limited impact assessments linking SMFEs directly to poverty reduction.

The difficulty in stating their impact in more generalisable terms is partly due to the diversity of contextual conditions in which they operate that may help or hinder their success (see Chapter 4). In a global literature review, Sanchez Badini *et al.* (2018) identified 12 critical success factors, essential for creating favourable enabling business environments for SMFEs to thrive and work towards poverty alleviation. These are: a stable and transparent macroeconomic setting; simplified and proportional regulatory frameworks; nuanced approaches to forest law enforcement; tenure security and clarity; devolved management and land use planning rights; appropriate and accessible markets; sufficient natural capital; available and accessible financial capital; sufficient forest management, business management and organisational capacities; and clustering through the creation of networks, associations, and cooperatives.

5.5.5 Market access

Improving market access in the context of poverty alleviation, narrowly defined, refers to interventions that enhance the physical (e.g. roads or infrastructure) and technical (e.g. intermediation networks, means of transportation) conditions for smallholders to access markets for selling their produce and/or to access inputs and services. In a wider sense, it refers to a disparate array of actions that affect the relationships of smallholders in the markets including actions for enhancing their capacities to engage in those markets and accrue benefits from market participation, such as reversing regulatory barriers, reducing market risks and transaction costs, and building capacities (Chamberlin and Jayne, 2013). While improving roads and infrastructure is often associated with development interventions, it may result from private investments (e.g. logging or plantation companies) that indirectly affect market access to local populations making use of those roads (Kleinschroth and Healey, 2017), stimulat-

ing as well the emergence of informal intermediation networks (Mejía and Pacheco, 2014).

The theory of change behind actions aimed at improving smallholders' access to markets assumes that enhanced market participation leads to positive impacts on household income and poverty alleviation (IFAD, 2015). Yet, greater market engagement may also increase risks or the ability for smallholders to capture economic rents, which may flow to actors better positioned in the value chain (Pacheco, 2012). For benefits to accrue to smallholders, several factors, processes and conditions shaping smallholders' market engagement have to be reversed or improved. These include technical, economic, policy and regulations, and institutional factors. Yet beyond markets, overall outcomes of market participation concern other conditions that facilitate access to other factors (e.g. technology, infrastructure, finance) (Torero, 2011). It is widely recognised that expanding market opportunities for smallholders, particularly in markets of high-value products, has positive impacts for smallholders (Russell and Franzel, 2004). While there is extensive evidence of how improving smallholders' access to agricultural markets affects livelihoods (IFAD, 2015), the evidence of this link for forests and trees is relatively slim.

Market access interventions can be traced back to rural development projects aimed at building farm-to-market roads, that evolved into integrated rural development programmes in the early 1970s (Ruttan, 1984), yet over time those evolved into programmes for enhancing agricultural competitiveness embracing the different market dimensions, and efforts to mainstream sustainable natural resources management. The latter included initiatives to enhance market access and competitiveness for smallholders to benefit from timber as well as NTFPs extraction, and tree-crops production in agroforestry systems. Market access is a key ingredient of rural development and poverty alleviation projects, and it has been widely embraced, with some variations, particularly across developing countries.

Clear evidence of the impacts that enhancing market access has on alleviating poverty of smallholders in forest landscapes is limited and context-dependent. In Ghana, improving roads may lead to better market integration and higher yields, and improved land use while reducing farm expansion into forests (Acheampong *et al.*, 2018). In Vietnam, enhancing access (through both physical and technical aspects) to markets (mainly international markets for timber and high-value products) may have had positive income benefits for smallholders

(Frey *et al.*, 2018). However, some studies show that economic returns to smallholders remained low even after the improvement of road infrastructure, such as in Brazil, suggesting that improving physical connectivity is not sufficient to increase rents of smallholders (Oliveira *et al.*, 2019).

The variation in outcomes suggests the importance of looking at the other factors and conditions explaining such variation. For example, outcomes may be defined by location, access to means of production transaction costs, access to infrastructure, technology, transportation and market/governmental institutional relationships (Torero, 2011). The poverty impacts of interventions aimed at improving market access, in the context of wider efforts for value chain development, often depend on the households' levels of pre-existing asset endowments (Donovan and Poole, 2013). When specifically considering smallholder forestry and tree-farmers, the most important variables may include clear ownership of trees, reliable markets, sympathetic legal and regulatory frameworks, and availability of technical options (Midgley *et al.*, 2017). Additional ingredients identified by comparative studies when assessing smallholder engagement in markets, particularly in agroforestry, are also access to information and contractual agreements (Russell and Franzel, 2004). In sum, multiple factors, processes and conditions can influence the benefits that smallholders may obtain from improved market participation, some of which are reviewed in this chapter.

The evidence provided here is comprised of different case studies, with a focus on small-scale timber plantations, NTFPs and some high-value agroforestry products. There is a need for more systematic assessments across a variety of situations of market engagement in order to further develop the evidence concerning the linkages between market access and poverty reduction, and to determine whether the outcomes in the forestry sector may differ from those in the agricultural sector.

5.5.6 Forest producer organisations

Forest producer organisations (FPOs) are any formal or informal group, association, cooperative or union of forest producers (Tirivayi *et al.*, 2018), with a purpose of producing, processing or marketing goods originating from forests, including timber and wood products as well as commercial NTFPs (Pasiecznik and Savenije, 2015). FPOs vary in size, composition and legal form (deMarsh *et al.*, 2014; Tirivayi *et al.*, 2018), and are found across the world (e.g. Pasiecznik and Savenije, 2015; FAO and AgriCord, 2016).

The theory of change linking FPOs to poverty alleviation holds that forest-based producers face a number of challenges that impede their abilities to benefit from economic opportunities provided by forests, including insecure tenure; disorganisation; poor access to markets, services and information; lack of capacity; and exploitation by more powerful actors (Macqueen, 2008). FPOs can help address these challenges by facilitating the aggregation of products; enhanced bargaining power; better access to capital, inputs, technical services and markets; as well as increased political power (deMarsh *et al.*, 2014; Pasiecznik and Savenije, 2015; Hajjar and Kozak, 2017; Tirivayi *et al.*, 2018). In turn, overcoming these challenges is expected to increase members' incomes (FAO and AgriCord, 2016).

A few studies explicitly assess the performance of producer organisations in terms of poverty alleviation specifically in a forest context. In Ethiopia, an econometric analysis of five forest-adjacent communities found that following the devolution of forest rights, local communities gained access to frankincense production and trading by organising themselves in cooperatives (Tilahun *et al.*, 2016). Cash income from frankincense cooperatives resulted in a 3.6% reduction in poverty rates among member households, as well as significantly higher incomes and lower poverty levels than non-members, though the authors also note that membership in cooperatives was biased towards relatively better-off households. In Côte d'Ivoire and Ghana, a study of 453 cacao producers across six sites found forest cooperative members to generate relatively higher incomes from cacao than non-members (Calkins and Ngo, 2010). And in Turkey, a study analyzed socio-economic household survey data from 203 small-scale timber producing villages, and also found cooperative members to have higher incomes in comparison to non-members – though wealthier households were significantly more likely to be members (World Bank, 2017).

A number of largely qualitative case studies across a range of forest commodities indicate that FPOs can contribute significantly to poor members' incomes (e.g. Tiveau, 2008; Pandit *et al.*, 2009; Pasiecznik and Savenije, 2015; Tieguhong and Schure, 2015; Humphries *et al.*, 2020). However, not all of these studies provided clear accounts of the data and methods used to calculate the claimed improvements in income (e.g. Pasiecznik and Savenije 2015; FAO and AgriCord, 2016). Tirivayi *et al.* (2018) also suggested that FPOs can play an important role in providing various social protection services, though noting that their study found no evidence on the effectiveness of those services.



Sharing knowledge to improve the chances of success of a cashew (*Anacardium occidentale*) plantation in Benin
Photo © Dan C. Miller

Positive effects on incomes or poverty alleviation were attributed particularly to improved access to more lucrative markets or buyers (Burke, 2010; Pasiecznik and Savenije, 2015), collective bargaining (Tiveau, 2008; Ahenkan and Boon, 2010) and collective ownership of productive resources (Dammert, 2019), facilitating access to training, technical assistance and credit (Birchall, 2003; Calkins and Ngo, 2010; Pasiecznik and Savenije, 2015; FAO and AgriCord 2016; World Bank, 2017), and targeted development interventions and livelihood-diversification interventions (World Bank, 2017). In Burkina Faso's largely female-dominated shea nut value chain, 76% of surveyed women noted improvements in their financial situation as a result of their participation in shea producer groups (Chen, 2017). Evidence from Latin America found that collective organisation was instrumental to obtaining certification for forest products (Duchelle, 2009; Dana and Mallet 2014), while Mala *et al.* (2012) found FPOs to be instrumental in strengthening the bargaining power of NTFP producers in Mali vis-à-vis traders. Even in instances where incomes are limited, cooperatives

can provide employment to marginalised groups with limited alternatives (Burke, 2010; Shackleton *et al.*, 2011). Studies have also identified key enabling conditions, including: devolution of forest tenure or forest product user rights to cooperatives (Tilahun *et al.*, 2016; World Bank, 2017), technical and financial assistance from external actors (Brown *et al.*, 2011; FAO and AgriCord, 2016; Humphries *et al.*, 2020), as well as direct relationships between FPOs and international buyers, particularly with respect to niche markets (Elias and Carney, 2005; Lybbert *et al.*, 2011).

However, membership fees and other upfront investments associated with FPOs can effectively work to exclude the poorest community members (Kazooru *et al.*, 2006; Oduro and Osei-Akoto, 2008; Pandit *et al.*, 2009; Atmiş *et al.*, 2010; Shiferaw *et al.*, 2011). Exclusionary institutional arrangements, such as one-member-per-household rules, as well as time and labour requirements associated with participation, can serve to specifically exclude women from participating in FPOs (Stoian *et al.*, 2018). In addition, while Elias and Arora-Jonsson (2017) found the shea union in Burkina Faso to

build many members' social capital and strengthen cohesion, social divisions including along lines of gender, age and ethnicity often influenced processes of inclusion and exclusion.

A few studies (e.g. Atmiş *et al.*, 2010; le Polain de Waroux and Lambin, 2013) found that FPO membership had no or limited impacts on poverty alleviation; Markelova *et al.* (2009) cautioned against generalising from successful case studies since failures tend to receive less attention. Indeed, a number of studies highlighted challenges facing FPOs, including: poor tenure security; complex or weak regulatory environment; poor market access; limited scope and scale of operations; limited investment capital; price fluctuations; conflict and elite capture (Molnar *et al.*, 2007; Macqueen, 2008; le Polain de Waroux and Lambin, 2013; Schure *et al.*, 2013; Tirivayi *et al.*, 2018). Critically, such challenges may affect the financial viability of cooperatives over time (Dossa, 2012), particularly in instances where costs are subsidised by external donors (Humphries *et al.*, 2020). Indeed, members' poverty can constrain economic growth, if FPO members prioritise immediate needs over long-term investments (Atmiş *et al.*, 2010).

5.5.7 Company-community partnerships

Forest-related company-community partnerships refer to the full range of formal and informal relationships, agreements, deals between communities and companies with the expectation of realising gains from sharing capacities and risks (Mayers, 2000; Ros-Tonen *et al.*, 2008; Le Tourneau and Greissing, 2010). The partnerships typically include contract production (discussed in Section 5.5.8), joint ventures and equity sharing agreements, farm forestry support, farm forestry crop-sharing, concessions leased from communities, and group certification with company-leased land from farms, among others (Andrew *et al.*, 2000; Mayers and Vermeulen, 2002; Ojwang, 2000). The products from these deals include timber products such as logs and wood fibre, and a variety of NTFPs such as nut oils, rubber, resins, juice pulp, and agricultural products for the cosmetic, food, automobile and pharmaceutical industries. Company-community partnerships are expected to result in the vertical integration of disconnected rural forest enterprises into global supply chains by providing rural producers with better access to markets and capacity (Mayers, 2006; Vermeulen *et al.*, 2008), improving incomes and net returns from land and labour (Brubacher, 1998; Ojwang, 2000; Mayers, 2006).

A number of case studies have described vari-

ous company-community contracts, but few have carefully examined the explicit impacts of these contracts on poverty alleviation (Mayers, 2006). One study found that communities in the Brazilian Amazon engaged in logging contracts with a company saw increases in household incomes relative to communities not participating in such contracts, without compromising NTFP harvests (Menton *et al.*, 2009). The one-off income from timber sales was used for investing in agricultural production or household infrastructure. Other case studies describe benefits from company-community partnerships such as: increased incomes; access to markets and sometimes premium prices; employment opportunities; improving land use options; securing land rights; and upgrading social infrastructure (Le Tourneau and Greissing 2010; Mayers and Vermeulen, 2002; Menton *et al.*, 2009; Morsello *et al.*, 2012; Vermeulen *et al.*, 2008). Out-grower schemes for commercial forest products (further discussed in 5.5.8) have also improved human, physical, and financial capitals of organised smallholder producers in Ghana, Papua New Guinea and South Africa among other places, and improved their *resilience* to shocks and vulnerabilities (Warner and Bauer, 2002; Mayers, 2006; Ntisisif, 2010). In many cases, however, the inequitable distribution of benefits within communities can deepen social *inequity* and weaken social cohesion, while power imbalances between partnering communities and companies can increase community dependence on external actors and result in unfair or inequitable distribution of benefits in these partnerships (Mayers, 2006; Ros-Tonen *et al.*, 2008; Menton *et al.*, 2009; Le Tourneau and Greissing, 2010).

By building consensus on partnership aims, governance reforms that secure tenure and land rights for local communities, improving capacity of local communities to negotiate partnerships, equitable risk sharing, long-term commitment to the partnership, ethical business practices, and periodic evaluations, these partnerships can significantly contribute to poverty alleviation and environmental outcomes (Desmond and Race, 2000; Mayers and Vermeulen, 2002).

5.5.8 Contract production

Contract production, a type of company-community partnership, is a form of vertical coordination within value chains in which production is carried out through a fixed-term formal or informal sales agreement between a producer and a processing or marketing company (Little and Watts, 1994). While contractual attributes are

highly diverse (Bellemare and Lim, 2018), they often involve commitments by a company to provide inputs, credits, technical support, a guaranteed output market and/or fair offtake prices (Da Silva and Rankin, 2013). Producers in turn commit to fulfilling the company's process or product requirements, delivery schedules and exclusivity terms (Eaton and Shepherd, 2001).

While typically commercially driven, such arrangements are widely viewed by policymakers and development practitioners as a promising tool to overcoming the pervasive market imperfections that perpetuate rural poverty (Meemken and Bellemare, 2019). Companies can more effectively manage the high transaction costs associated with open market sourcing, while small producers gain access to new and often more secure (global) markets and the resources needed to produce marketable surplus (Ton *et al.*, 2018; Meemken and Bellemare, 2019). This has the potential to translate into higher incomes, more resilient livelihoods, competitiveness and total factor productivity gains.

Contract production in developing countries is especially prevalent in the agricultural sector (Grosh, 1994; Oya, 2012). In addition to traditional cash crops such as sugarcane, tobacco, cotton and tea, across much of the tropics, tree crops such as cacao and oil palm are also widely produced under production contracts. In countries such as India, Thailand and South Africa, timber species such as teak, pine, and eucalyptus are also commonly cultivated under such arrangements (Sartorius and Kirsten, 2002; Boulay and Tacconi, 2012). Since many NTFPs suffer from diseconomies of scale, and quantities and qualities can be difficult to control (Pierce *et al.*, 2008), few are harvested and/or processed under contract. Most documented cases come from the Amazon, typically involving some form of 'community-company partnership agreements' for comparatively high-value NTFPs such as Brazil nut, palm hearts and acai (van Andel, 2007; Morsello *et al.*, 2012).

Because many agribusinesses are often unable to achieve economies of scale through plantation production systems, labour conflicts and restrictive tenure regulations, supplementary small-holder sourcing is often an economic necessity (Vermeulen and Cotula, 2010; Ton *et al.*, 2018). While some critics contend that contract production can be an exploitative and extractive mode of production due to the inherent power imbalances and uneven dependency structures (Little and Watts, 1994; Oya, 2012), several empirical studies employing econometric techniques indicate that contract production has been widely associat-

ed with household income and farm profitability gains (Bolwig *et al.*, 2009; Miyata *et al.*, 2009; Bellemare, 2012; Narayanan, 2014; Girma and Gardebroek, 2015). However, some of these studies can be critiqued due to, *inter alia*, selection, publication and reporting biases and weak identification (Ton *et al.*, 2018; Bellemare and Bloem, 2018). Other dimensions of welfare are less addressed by this literature, but some studies do point to positive *food security*, *gender equality* and subjective well-being effects (Morsello *et al.*, 2012; Dedehouanou *et al.*, 2013; Bellemare and Novak, 2017). In demonstrating that participation may intensify environmentally unsustainable activities and household labour burdens, the study by Morsello *et al.* (2012) of Brazil nuts in Bolivia and Brazil does point to potential participation trade-offs.

Since most of these studies are based on case studies of specific contracting relations or are confined to specific geographic areas, findings do tend to suffer from a lack of external validity (Meemken and Bellemare, 2019). One of the few studies based on nationally-representative survey data suggests that the oft-cited income effect is likely overstated (Meemken and Bellemare, 2019). Furthermore, with the exception of Morsello *et al.* (2012) and Girma and Gardebroek (2015), much of the quasi-experimental literature is focused on agricultural (tree) crops. Despite the abundance of studies on timber contract production, such studies are largely qualitative, published as grey literature, reliant on descriptive statistics and/or do not consider counterfactuals (e.g. Cairns, 2000; Desmond and Race, 2000; Mayers and Vermeulen, 2002; Howard, 2005).

There is some evidence that contract production can exacerbate social differentiation. For example, most studies control for, and identify self-selection biases and processes of involuntary exclusion. They observe that contract production participants tend to be more affluent, educated and asset endowed (Miyata *et al.*, 2009; Bellemare, 2012; Narayanan, 2014). The participation of vulnerable and marginalised groups can be constrained by the perceived opportunity costs of allocating finite land and labour resources to the contracted commodity, reduced risk tolerance and companies imposing eligibility criteria to control transaction costs (Bellemare, 2012; Ton *et al.*, 2018). This calls into question whether contract farming – in the absence of additional institutional support and formal checks and balances – adequately serves as a tool for inclusive rural development. Positive spillover/contamination effects may nevertheless materialise through job creation, infrastructure investments, and technology/skill transfers (Ton

et al., 2018). However, few studies explicitly assess such externalities. Meemken and Bellemare (2019) found positive spillover effects onto local labour markets, but did not observe any positive welfare impacts on non-participant households.

5.5.9 Certification

Certification is “a procedure by which a third party gives written assurance that a product, process or service is in conformity with certain standards” (ISO, 1996). Certification relevant to forestry can take many forms, but has long been found in the form of voluntary sustainability standards in high forest-risk commodity sectors. This includes the Forestry Stewardship Council (FSC), the Roundtable on Sustainable Palm Oil (RSPO), Rainforest Alliance/UTZ, Fair Trade, and the Sustainable Agriculture Network (SAN), which certify forest-related commodities such as palm oil, timber, pulp and paper products, coffee and cacao, and a range of agricultural crops. Each of these systems has its own sustainability standards that include a wide range of social and environmental criteria that producers have to comply with to become certified. In some countries and sectors, producers and governments have also begun developing mandatory certification systems (e.g. palm oil in Indonesia) and national standards (e.g. the Programme for the Endorsement of Forest Certification (PEFC) (Overdeest, 2010; Schouten and Bitzer, 2015; Pacheco *et al.*, 2018). Public standards have been critiqued as being inferior to, and for undermining, private standards (Overdeest, 2010; McCarthy, 2012; Hospes, 2014), while others suggest that they help prepare smaller producers for other standards (Higgins and Richards, 2018; Schoneveld *et al.*, 2019).

Certification by smallholders and community-based organisations is widely viewed as an important rural development mechanism. The theory of change holds that adoption of better practices can enhance productivity and resilience, and reduce production risks, while creating opportunities to sell to buyers that can offer improved terms of trade (e.g. price premiums, offtake guarantees, services). These could lead to higher and more stable income for smallholders, thus contributing to poverty reduction.

The evidence is mixed as to whether these benefits materialise in practice. Many certification systems were developed in response to, and accommodating the needs of, corporate producers, and therefore respond poorly to the interests of smaller producers (Brandi *et al.*, 2015). Smaller producers typically face comparatively high com-

pliance barriers and are often not incentivised, or are unable, to adapt their production practices and strategies (Schoneveld *et al.*, 2019; Brandi *et al.*, 2015). They often lack the necessary resources to absorb certification costs, or the capacity to adopt prescribed practices and to manoeuvre the public bureaucracy in order to obtain the needed legal documentation (Brandi *et al.*, 2015; Schoneveld *et al.*, 2019). Furthermore, price premiums rarely suffice and access to alternative, oftentimes informal, market outlets reduce the certification imperative, especially in the timber and palm oil sector (Burivalova *et al.*, 2017).

FSC also certifies forests managed for NTFPs, but certification of NTFPs has proven to be especially problematic due to *inter alia* low profit margins, underdeveloped markets, and legality issues (Pierce *et al.*, 2008). For NTFPs, much of the existing literature has examined how and under what conditions they can be certified, but not their impacts. However, evidence from Brazil suggests that NTFPs serving large, mature markets can be successfully certified with the right government, donor and civil society support (Guedes Pinto *et al.*, 2008). One study on Brazil nuts suggested the economic impacts of NTFP certification is mixed and highly context-specific (Duchelle *et al.*, 2014). A study exploring the gendered impacts of organic certification of shea nuts similarly provided inconclusive evidence (Kent, 2018). Nevertheless, with the exception of the cacao and coffee sectors, certification rates remain low amongst small producers and community forest management units and enterprises.

Despite the systematic barriers to adoption, a multitude of studies on smallholder cacao certification in Ghana and Ivory Coast demonstrate that tangible social benefits can accrue. The adoption of better practices can increase agronomic capacity, yields and resilience to shocks; thereby positively impacting farm-level profitability, which often translates into improved household income and (financial) well-being (Krain *et al.*, 2011; Paschall and Seville, 2012; Gockowski *et al.*, 2013; Ingram *et al.*, 2014; Astrid Fenger *et al.*, 2017). Since certification typically demands improved farmer organisation, (support for) certification also contributes to the development of more professionalised producer associations (Ingram *et al.*, 2018a).

In the timber sector, the limited evidence on the impacts of community forest management certification suggests that certification is rarely financially attractive, but can help strengthen land tenure and community empowerment (Cerutti *et al.* 2014; Burivalova *et al.*, 2017). Because of high costs and market uncertainties, certification of

small-scale tree growing similarly rarely translates into net (economic) benefits (Maraseni *et al.*, 2017; Maryudi *et al.*, 2017; Ling *et al.*, 2018; Flanagan *et al.*, 2019). Nevertheless, there are some documented examples of community-based forest enterprises overcoming financial viability issues when partnering with social movements and government agencies (Macqueen *et al.*, 2015).

The scientific quality of existing studies is mixed. Many of the cacao impact studies are published as grey literature, with unclear methods and analytical rigour (Ingram *et al.*, 2018a). Similarly, few studies on certified community forest management conform with standards for impact assessment (Burivalova *et al.*, 2017) and neither do studies on palm oil, NTFPs or timber. Existing literature also tends to focus heavily on practices, productivity gains and income, but often neglects to critically interrogate other pertinent impacts such as effect on household labour burden, food security and portfolio composition, as well as broader societal effects. Where certification can become an important lever for poverty alleviation, it is usually when smallholders are more actively engaged or their needs considered in the design of standards (Loconto and Dankers, 2014).

5.5.10 Zero deforestation commitments

Supply chain initiatives are commitments made by private sector entities – either individual companies or groups of companies – to adopt more sustainable sourcing policies, in relation to one or more commodities (e.g. timber, soy, palm oil, beef), often by a specific date (Brown and Zarin, 2013; Lambin *et al.*, 2018). They include “aspirational goals by single companies or coalitions of actors, corporate codes of conduct and sustainability standards that, in some cases, are implemented through certification schemes and moratoria” (Lambin *et al.*, 2018). As they relate to forests, many of these supply chain initiatives are frequently referred to as “zero deforestation commitments” (ZDCs). Such ZDCs can be implemented at the property level or across larger jurisdictions and frequently apply to all producers within the adopting-company’s supply chain (Meyer and Miller, 2015). As of March 2017, Lambin *et al.* (2018) noted that at least 447 producers, processors, traders, manufacturers and retailers had made at least 760 public ZDC commitments.

Many ZDCs and other supply chain initiatives contain criteria that relate to social dimensions of sustainability. Zero deforestation commitments frequently include guarantees to improve a company’s conduct towards various groups of people,

including Indigenous and other forest-dependent people who live in and around forests used for commodity production; labourers employed by commodity-producing or processing companies; and smallholders who produce commodities and sell them into larger supply chains (Newton and Benzeev, 2018). Therefore, if companies that adopt ZDCs honour their pledges, then poverty may be reduced in one or more ways. For example, if Indigenous and forest-dependent people are properly compensated for their land, or if they are given greater opportunities to retain control or ownership of, or access to, forested lands, they may be better off relative to a scenario in which land is ‘grabbed’ by commodity-producing companies (Liao *et al.*, 2016). If labourers are fairly compensated for their work, and if children are not exploited in commodity production but are rather free to pursue education, then levels of poverty may in time be reduced among communities of people employed in the commodity sector. And if smallholder commodity producers are fairly paid for their production, and are not excluded from supply chains by costly procedures, then they may be more likely to earn higher incomes. Many of these examples, and many of the environmental and social criteria contained within supply chain initiatives including ZDCs, refer to the elimination of worst-practices. Such initiatives often do not promote or strive for best-practices. But even the elimination of worst-practices might conceivably reduce poverty, if doing so removes barriers and constraints to individuals and communities.

A recent review of the impacts of ZDCs on social outcomes, including poverty, identified no evidence of a relationship between supply chain initiatives and poverty alleviation (Newton and Benzeev, 2018). Larson *et al.* (2018) reported a suggestion by a government official that the stringency of the Indonesian Palm Oil Pledge (a supply chain commitment by five major palm oil companies) may have negatively affected smallholder income by making it more difficult for them to sell their produce. In sum, we found no evidence that supply-chain commitments have reduced poverty or improved human well-being. In part, this could be due to the primacy of the environmental focus of many such pledges.

5.5.11 Boycotts

Consumer boycotts of timber from particular companies, countries or regions have been promoted as a mechanism by which to encourage more sustainable and more responsible timber production. The theory of change states that boy-

cotts will work if a firm's profit is sufficiently reduced to prompt it to adopt changes (Delacote, 2006). However, the likelihood of success of a boycott can be low, as a consequence of: a) the challenges of coordinating consumer behaviour, b) the allure of free-riding behaviour, c) the paradox that those consumers who have the greatest capacity to affect a firm's profits also have the highest opportunity cost of engaging in a boycott, and d) the challenge of only small numbers of consumers being sufficiently concerned (Delacote, 2009). If a boycott does overcome these challenges, the theory of change suggests that by being temporarily excluded from markets, economies and firms that depend on timber production are more likely to adopt more sustainable methods, including by becoming certified – for example, through FSC certification (see Section 5.5.9). In turn, FSC certification is theorised to result in economically just and equitable production standards, which may confer greater benefits on labourers, employees and communities living in and around timber-production areas. Thus, while timber boycotts have principally been motivated by environmental concerns, there is a plausible causal mechanism by which they could lead to social benefits, including poverty reduction. That said, if a boycott persisted for any length of time it could also plausibly exacerbate poverty locally if it were to damage the local market, jobs and income opportunities.

Various organisations have called for boycotts of non-certified timber (Damette and Delacote, 2011) and boycotts are reported to have been successful in catalyzing the cessation of logging old-growth forests and adopting more sustainable practices (Innes, 2006). For example, boycotts organised by the Rainforest Action Network and others have resulted in hundreds of timber retailers adopting FSC certification (Innes, 2006). Indeed, along with broader public concern about deforestation, boycotts are reported to have been responsible for the rise of FSC and other certification programmes (Putz and Viana, 1996).

Any impacts of boycotts on poverty are most likely to be manifested through the adoption of sustainability standards such as FSC certification. As such, we encountered no direct evidence that boycotts have led to measurable poverty reduction or to changes in other measures of human well-being. But to the extent that boycotts are effective in promoting the adoption of sustainability standards, and to the extent that the adoption of sustainability standards in turn leads to poverty reduction, there may be an indirect cause-and-effect connection between boycotts and poverty reduction.

5.6. Forest and Tree Management Levers

5.6.1. Agroforestry

Agroforestry refers to the intentional integration of trees and other woody perennials in crop and livestock systems. Agroforestry practices can improve farmer livelihoods and resilience through diversifying agricultural production and income sources. For example, a large-scale study of five countries in sub-Saharan Africa found that a third of rural smallholder households grow trees, which contribute an estimated 17% of total annual gross income for these households (Miller *et al.*, 2017). Several other levers can be used to support the more optimal integration of trees into farming systems. These include extension programmes, PES, certification schemes, linking producer organisations to out-grower schemes, strengthening seed delivery systems, improving tenure security, and addressing policy and institutional barriers, such as laws that prevent or overly regulate the harvesting of protected forest species on farm.

There have been a few notable impact evaluations of agroforestry interventions that evaluated economic, social and ecosystem services outcomes (Kuntashula and Mungatana, 2013; Bostedt *et al.*, 2016; Coulibaly *et al.*, 2017; Amadu *et al.*, 2020; Hughes *et al.*, 2020). These have shown that extension and training, coupled with the provision of tree germplasm in some cases, led to increased agroforestry adoption. This in turn led to increased yields, household income, food security and dietary diversity. For example, in Malawi, agroforestry adoption contributed to a 20-35% increase in yields, which provided increased income opportunities as well as better food security (Coulibaly *et al.*, 2017; Amadu *et al.*, 2020).

However, evidence on the linkages between agroforestry adoption and such impacts acquired through the use of rigorous impact evaluation methods such as randomised control trials and quality quasi-experimental studies, is extremely limited (Miller *et al.*, 2020). The few studies that have used impact evaluation methods tend to not directly assess poverty outcomes, but instead use proxies such as income, expenditure and food security. Additionally, existing impact evaluations often have a high risk of bias (Miller *et al.*, 2020).

Other studies that use non-randomised regression analysis provide evidence that agroforestry can contribute towards alleviating poverty, but these studies are also limited. In Bangladesh, a participatory agroforestry programme was associated with significant poverty reduction, measured

using the headcount index, poverty gap index and Foster-Greer-Thorbecke methods to assess levels of poverty and extreme poverty (Islam *et al.*, 2012). The programme improved the poverty situation of 33% of participating households, reduced the poverty gap of 10% of participating households, and reduced the severity of poverty of 5% of participating households. Agroforestry programmes like this enable farmers to diversify their production and increase their income sources, including through the sale of timber, fuelwood and tree crops, thereby contributing to poverty reduction. Dairy production and returns can also be enhanced among producers who make use of leguminous high protein fodder species (Place *et al.*, 2009).

In other contexts, trees are established to enhance the provisioning of ecosystem services, such as carbon sequestration. In these cases, incentive or market-based programmes (Section 5.5) are used to promote agroforestry (Hegde and Bull, 2011; Pagiola *et al.*, 2016; Hagggar *et al.*, 2017). A common example is coffee agroforestry, where coffee trees are grown under the shade of other tree species. Certification schemes allowing farmers to certify that their products were sustainably produced, such as Fairtrade, Organic or Rainforest Alliance coffee certifications, enable a market-based approach for farmers to receive higher prices for their products for practising agroforestry (e.g. shade-grown coffee) and using other sustainable practices. The results of such schemes, however, are mixed, highlighting the importance of context-specific, evidence-based design of such programmes. There is also little evidence of their long-term effectiveness.

There is evidence of a difference in the labour burden between women and men in some agroforestry systems (Kiptot and Franzel, 2012). Typically, women tend to be burdened with much of the labour of planting and maintaining trees and are often excluded from the higher value agroforestry enterprises, such as timber and commodity crops. Women participate in the lower-value enterprises that men avoid, such as collection of fuelwood, fodder, mulch and indigenous fruits and vegetables. These lower-value enterprises can still contribute a significant portion of women's annual income (between USD 7 and USD 2,629 annual revenue from agroforestry products) (Kiptot and Franzel, 2012). Several impact evaluations of different agroforestry programmes found that women have lower participation in and benefits from agroforestry interventions (Place *et al.*, 2005; Hegde and Bull, 2011) due to different endowments, discrimination and exclusion, or inequitable programme design. Women's disproportionate tenure insecurity

is another major disincentive that restricts their participation in agroforestry (Quisumbing *et al.*, 2014).

Along with improving incomes through increased yields or incentive provision, agroforestry can enhance resilience and support farmers to adapt to climate change (Verchot *et al.*, 2007; Thorlakson and Neufeldt, 2012; Quandt *et al.*, 2019). For example, agroforestry can diversify the products that farmers sell, providing additional sources of income, particularly in times of need. Similar to livestock, small-scale farmers often sell timber and other products on farm to meet a pressing expenditure need, such as school and hospital fees (Schreckenberg *et al.*, 2002; Place *et al.*, 2009; Kiptot and Franzel, 2011). Some agroforestry practices can also help farmers withstand climate-related shocks through preserving soil moisture during dry spells and by protecting crops from floods (Garrity *et al.*, 2010; Thorlakson and Neufeldt, 2012).

Overall, agroforestry programmes have the potential to contribute towards poverty alleviation, but additional research is necessary to understand how this potential can be better exploited across the planet's heterogeneous landscapes and socio-economic contexts.

5.6.2 Forest restoration, reforestation and afforestation

The return or expansion of forest cover can be achieved in many different ways. Forest restoration refers to the return of a near to original forest ecosystem (Lamb and Gilmour, 2003). More commonly used terms refer to *ecological restoration*, *ecosystem restoration* or *forest landscape restoration* (FLR), although a recent review found at least 24 different terms associated with restoration (Mansourian, 2018). Widely used approaches to return trees to a landscape include *afforestation* (i.e., planting forests on land not classified as forests) and *reforestation* (i.e., planting trees on land classified as forests) (Stanturf *et al.*, 2014). Forest restoration activities are further differentiated by the amount of human involvement they require. Natural regeneration can improve the ecological function of degraded forests and return converted areas into forest land with minimal or no human involvement (Chazdon and Guariguata, 2016). Alternatively, forest restoration can also occur through human activities that prepare sites, remove unwanted species or individuals and plant trees (Le *et al.*, 2015). Though forest restoration has gained visibility as a cost-effective method for removing atmospheric carbon

(Stanturf *et al.*, 2015; Busch *et al.*, 2019; Bastin *et al.*, 2019; Brancalion *et al.*, 2019), its ability to promote livelihoods and well-being outcomes remains uncertain. Recognising this, FLR was defined in 2000 as an approach with the twin goals of enhancing ecological integrity and human well-being (Mansourian, 2005). A review of an FLR project in Madagascar, for example, found that 1,400 households were able to benefit from alternative income generating activities promoted under the project, including improved rice production, which led to a 2-4 fold increase in production (Mansourian *et al.*, 2018).

Forest restoration, reforestation or afforestation can produce livelihood impacts through direct and indirect benefits (Erbaugh and Oldekop, 2018). Direct benefits refer to what households receive from the implementation of forest restoration activities. They may include payments for tree planting activities, payments for ecosystem services that restored forests provide, the provision of land or resource rights, or the delivery of training to populations proximate to restored forest areas (Adams *et al.*, 2016). Indirect benefits refer to outcomes that occur as a result of having implemented restoration activities, and they are most likely to affect poverty over longer-time horizons. They include benefits from improved ecosystem function (e.g. greater NTFP availability, water quality and availability, soil fertility, carbon sequestration), strengthened resource rights for local populations and improvements in infrastructure (Adams *et al.*, 2016; Erbaugh and Oldekop, 2018). Though these pathways highlight many possible contributions forest restoration can make to livelihoods and well-being, research on forest restoration finds a mixed impact on poverty alleviation and livelihood benefits.

A growing body of evidence demonstrates how forest restoration, reforestation or afforestation provides direct livelihood benefits. A large-scale afforestation programme in China, the Sloping Land Conversion Project (see Box 5.2), provided subsidies for afforestation activities to low-income, rural households. The programme has demonstrated that afforestation programmes can incentivise the intensification of smallholder agriculture and increase off-farm labour earnings (Zhou *et al.*, 2007; Yin *et al.*, 2014). Small-scale projects have also had positive livelihood benefits. A social forestry programme in South Kalimantan increased farm-based income and natural forest cover (Hiratsuka *et al.*, 2019) and farmer-managed natural regeneration in Ghana increased asset ownership and income diversity (Weston *et al.*, 2015). Though these examples show how direct benefits

from forest restoration projects and activities can produce livelihood benefits, assessing whether or not they reduce poverty is constrained by two barriers. First, restoration, reforestation or afforestation activities can lead to direct disadvantages, including the reduction of available agricultural land that decreases on-farm income or employment opportunities (Robbins and Harrell, 2014), the reduction of compensation or monetary benefits (Alix-Garcia and Wolff, 2014; Börner *et al.*, 2017) and the elimination of resource access rights (Barr and Sayer, 2012; Galudra *et al.*, 2014; Urgenson *et al.*, 2014). Second, direct economic benefits rarely (if ever) continue *ad infinitum*. Ensuring long-term benefits from restored forests complement direct and often short-term benefits may be important for lasting poverty reduction from forest restoration.

The ability of forest restoration to contribute indirect benefits that result in poverty alleviation is inconclusive. However, many studies find that restored forests contribute to a diversification of livelihood strategies and increases in income from timber and NTFPs (Aronson *et al.*, 2010; Le *et al.*, 2012; Adams *et al.*, 2016; Erbaugh and Oldekop, 2018; Ota *et al.*, 2018). For example, *secondary forest* regeneration coupled with the harvest of a local palm fruit in the coastal Atlantic forest region of southeastern Brazil improved farmer income, as well as soil quality and forest structure (de Souza *et al.*, 2016). Farmer-managed natural regeneration (FMNR), a practice where farmers actively manage and protect natural trees and shrubs to encourage an increase in woody vegetation, can also diversify incomes and improve livelihoods. For example, Haglund *et al.* (2011) estimated that FMNR contributed between USD 17 and 21 million to gross annual income of rural households (or between USD 46 and 56 per capita) in the region of Maradi, Niger, an 18-24% increase in income. Indirect benefits from forest restoration also accrued to households in central China as a result of the Mountain-River-Lake (MRL) Programme in the Poyang Basin. The MRL Programme is associated with lifting 9 million people out of poverty between 1983 and 2008. Though most of this poverty reduction is attributed to remuneration, improved credit from restoration activities, and access to agricultural technology, indirect benefits such as reduced flooding/soil erosion also contributed to reductions in poverty (Huang *et al.*, 2012). These examples are promising, but they do not rely on counterfactual analysis, and so may falsely attribute poverty reduction to restoration activities. Despite their limitations, these examples show that indirect well-being benefits from restored forests often ac-

crue over years or decades. Rights that ensure rural poor communities are able to use and manage restored forests are therefore key to reducing poverty through forest restoration (Nagendra, 2007; Mansourian and Vallauri, 2014).

Forest restoration can also deliver indirect institutional benefits to communities by providing improved clarity surrounding tenure or enhanced resource rights for newly restored forests (Le *et al.*, 2012; Erbaugh and Oldekop, 2018; Fox and Cundill, 2018). However, research more often finds that the success of restoration is predicated upon clear institutions for resource use (Galabuzi *et al.*, 2014; Call *et al.*, 2017; Legesse *et al.*, 2018). Thus, while the direction of benefits from forest restoration to ecological and economic benefits is clear though loosely substantiated, it remains less certain whether forest restoration tends to generate transparent tenure or vice-versa.

The impacts of forest restoration on poverty reduction are determined by interactions between the mechanism of governance used to implement restoration activities (e.g. CFM, PES), the process of implementation, and specific restoration goals. However, three general themes emerge from the relationship between forest restoration and poverty reduction. First, when forest restoration is associated with livelihood impacts, direct benefits often support the intensification of agriculture and/or the diversification of livelihoods to include more off-farm earnings and a greater number of products. Second, few studies have conclusively substantiated that livelihood benefits from services provided by restored forests meaningfully benefit proximate households to alleviate poverty. However, when poverty alleviation from restored forests seems likely, it occurs over years or decades. And third, forest restoration success and poverty alleviation from restored forests are closely associated with institutions for resource use.

5.7 Summary of Key Findings

We reviewed the evidence that forest-sector policies, programmes and strategies (i.e., levers) have alleviated poverty. We studied 21 different rights-based, regulatory, market and supply chain, and forest and tree management levers for which we could identify a plausible theory of change of how implementation of that lever might alleviate poverty (Table 5.1).

Overall, while we found substantial, varied, and context-dependent evidence of these levers being associated with mitigating poverty, including by supporting or improving well-being, we found limited evidence of these levers being associated with

reducing poverty (i.e., moving people out of poverty). It is worth reiterating, however, that many of these levers were primarily set up for forest conservation or other non-poverty related objectives, rather than with the explicit aim to reduce poverty.

From the studies that specifically examined poverty reduction (i.e. moving people above a certain poverty-level threshold), some of the strongest evidence came from ecotourism, protected areas – particularly those associated with ecotourism (e.g. Naidoo *et al.*, 2019; Ma *et al.*, 2019), community forest management (e.g. Oldekop *et al.*, 2019) and agroforestry (e.g. Islam *et al.*, 2012). Rigorous studies on payments for ecosystem services show small, but statistically significant, decreases in poverty in some cases (e.g. Sims and Alix-Garcia, 2017).

Out of the studies that more generally examined *poverty mitigation* (i.e. increasing income, assets and other aspects of well-being), a multitude of cases showing positive outcomes came from community forest management (e.g. Rasolofson *et al.*, 2017), forest producer organisations, (e.g., FAO and AgriCord, 2016), SMFEs (Macqueen, 2008), PES (e.g., Adjognon *et al.*, 2019), tree crop contract production (Morsello *et al.*, 2012) and, to a much lesser extent, REDD+ (in terms of its focus on tenure reforms – e.g. Lawlor *et al.*, 2013; Duchelle *et al.*, 2018).

5.7.1 Differentiated impacts

Few studies provided socially disaggregated information on poverty outcomes by showing how the levers included in the review affected different groups. However, a number of studies highlight the importance of social heterogeneity in the context of the assessed levers, including those levers with the strongest evidence of poverty alleviation. The assessed studies generally attributed socially differentiated outcomes, including differentiated opportunities, benefits, and trade-offs, to a combination of underlying material and sociocultural inequalities and the failure of a given lever to sufficiently account for and address those inequalities. For instance, insufficient financial resources may hinder the poorest producers from complying with formal standards (e.g. Obidzinski *et al.*, 2014) or paying the membership fees for producer organisations (e.g. Shiferaw *et al.*, 2011). While ecotourism may reduce poverty, it also risks increasing income inequality between households (Ma *et al.*, 2019). Gender differences (Stoian *et al.*, 2018), variations in ethnicity (Elias and Arora-Jonsson, 2017) or other axes of social differentiation often accentuate exclusionary outcomes. For instance, a number

of studies on ecotourism noted that women were typically relegated to lower-paying, gender-conforming jobs, while more remunerative positions were taken up by men (Gentry, 2007; Tran and Walter, 2014). Women also experienced a disproportionate loss of income due to forest exclusions associated with a PES programme (Tuijnman *et al.*, 2020), while many agroforestry practices increased women's labour burden, often without generating commensurate or accessible benefits (Kiptot and Franzel, 2012). Women's participation and benefits were lower than those of men in PES programmes in Kenya (Kariuki and Birner, 2016), while in a global comparative study on REDD+, women in project sites reported declines in subjective well-being in comparison to male-dominated groups within the same sites and women in control sites (Larson *et al.*, 2018).

5.7.2 Interpretation

An absence of clear and high quality evidence that forest-sector levers have moved people out of poverty does not necessarily constitute evidence that such levers cannot or even have not reduced poverty. Rather, it appears that relatively few researchers have explicitly explored poverty reduction, *per se*, through forest sector interventions. Many more studies have explored indicators of poverty mitigation, including impacts on income, assets and well-being. As an example of this distinction, there remains little concrete evidence of whether REDD+ has led to poverty reduction, but well-funded and coordinated efforts have systematically characterised REDD+'s contributions to livelihoods in cases globally. More studies are needed that explicitly speak about poverty reduction as an outcome variable of interest, rather than just poverty mitigation, in order to more fully assess forest-sector levers' impacts on poverty alleviation. Additionally, few studies have examined these phenomena at national or regional scales, instead typically examining impacts at the scale of a few communities or similar level administrative jurisdictions. Larger scale studies are needed to enable rigorous assessments of the role of these levers in relation to poverty.

The mixed conclusions on the efficacy of many of the levers is also an attestation to the importance of contextual differences, including the presence of enabling conditions and contemporaneous drivers of change (see Chapters 2 and 4, and Box 4.1 in Chapter 4), in shaping the effects of different levers. For several levers, we did not find generalisable, clear-cut evidence of impacts, positive or negative, given that conditions on the ground vary

widely across the globe. But site-specific studies do show that several levers have contributed to poverty mitigation under certain circumstances and in the presence of key enabling factors, including in conjunction with other levers. For example, having clear and secure local tenure rights to land and forest resources is key to the success of SMFEs, CFM, PES, community-company partnerships and agroforestry. Many SMFEs are reliant on tenure reform, market access, forest producer organisations and formalisation policies, to name a few necessary enabling conditions for their success. Market access alone is an insufficient condition to ensure poverty reduction; other factors enhance the effects of market access – among them the presence of forest producer organisations, certification and contract production. Protected areas in Costa Rica and Thailand were most effective at alleviating poverty when ecotourism opportunities were available. As such, the likelihood of success of a number of levers is intertwined with the functional presence of other levers.

Finally, a number of cross-cutting tools that often support programmatic interventions were not discussed in this chapter, but are relevant to the success of many levers. For example, new and enhanced technologies including equipment upgrades, mechanisation and improved germplasm can be important components of SMFEs, CFM, reforestation and agroforestry (Burney *et al.*, 2015; Haase and Davis, 2017; Hansen *et al.*, 2019 see also Chapter 6, Box 6.2). Financial capital, in the form of credit, aid or subsidies, can be essential in implementing many of the reviewed levers (Macqueen *et al.*, 2008; Humphries *et al.*, 2012; Sanchez Badini *et al.*, 2018). Capacity building, including financial literacy, financial inclusion and improved management practices, often accompany interventions that bring new practices and ventures to producers (Pokorny *et al.*, 2010; Hajjar *et al.*, 2011; Elson, 2012). Safeguards such as free, prior and informed consent (FPIC) and participation in intervention design are increasingly recognised in a rights-based discourse as essential components of interventions aiming to improve the lives of forest-reliant people (Lawlor *et al.*, 2013; FAO, 2018). These supporting components of interventions may in and of themselves have poverty impacts, but we did not have the granularity to isolate and assess those outcomes.

We encountered significant variance in the methods used to study different forest-sector levers. The literature on some levers was dominated by econometric analyses (e.g. PES programmes, protected areas) while the literature on other levers was dominated by qualitative or mixed method

case-studies (e.g. timber contract production). Different methodologies offer competing advantages, including the degree to which one can offer reliable conclusions about the contribution of any given lever to poverty alleviation. For example, probably the most rigorous evidence, in terms of being able to isolate and quantify the impact of forest-sector levers on local people, comes from payments for ecosystem services programmes and protected areas analysis. Here, a number of controlled, econometric studies with large sample sizes found that PES programmes on the whole did no harm to participant households, and provided small increases in some cases to household incomes and assets, but also did not find support for a strong role in poverty reduction. Two recent randomised controlled trials found positive impacts on well-being measures (Jayachandran *et al.*, 2017; Adjognon *et al.*, 2019). Studies of protected areas have similarly utilised matching-based, quasi-experimental designs, and national and global datasets to show their positive impacts on poverty reduction, as well as the conditions that increase likelihood of impacts (namely, presence of ecotourism and locations at intermediate distances from major cities; Ferraro *et al.*, 2011; Naidoo *et al.*, 2019). For ecotourism, while not assessed through similarly rigorous study designs, evidence of impact has been tracked through the number of visitors and the benefits they bring in terms of expenditures in local and national economies. Meanwhile, several levers were predominately assessed using case studies in variable contexts (e.g. company-community partnerships, SMFEs). On their own these provide rich information on mechanisms and outcomes, but, in aggregate, the variability in case contexts makes it difficult to assess the specific contributions of the lever to poverty alleviation, and challenging to make any generalised assessments across contexts. The absence of such evidence should not be interpreted as the ineffectiveness of these levers in potentially addressing poverty.

Importantly, this chapter does not evaluate the poverty alleviation impacts of non-forest sector interventions. This includes programmes such as cash transfers, energy substitutions, education and infrastructure initiatives, non-tree related agriculture extension and other levers that are implemented both within but also outside of forested landscapes. Such levers are likely to have substantial impacts on the poverty status of forest-reliant people in rural areas. Indeed, many are more explicitly focused on dimensions of poverty alleviation as their primary objective. In contrast, many of the forest-sector interventions that we reviewed

are focused primarily on forest conservation, and include social objectives only as a second-order concern. One example of a non-forest sector lever on poverty alleviation is the national cash-transfer programmes in Brazil that accounted for an average 54% of household income among agricultural households at the forest frontier (Dou *et al.*, 2017). Relatedly, Indonesia's national anti-poverty programme reduced village-level deforestation by 30% by reducing the reliance of rural households both on deforestation as a coping strategy and on forest products as an alternative to market-purchased goods (Ferraro and Simorangkir, 2020). Such programmes and impacts are not captured in this review and should be evaluated separately.

5.8 Knowledge Gaps and Future Research

We identified four ways in which the evidence base for how different forest-sector levers contribute to poverty alleviation could be strengthened. First, where appropriate, research designs could control for varying contextual conditions and isolate the mechanisms and levers in question to help illuminate the role of these levers in poverty alleviation. Second, more studies are needed that look at promising levers' contributions to moving people out of poverty rather than focusing on well-being contributions. Third, little research has examined the long-term poverty alleviation effects of forest-sector interventions. Fourth, our review does not explore the relative economic costs of alternative levers. In sum, a combination of more rigorous and long-term research designs, along with examinations of the cost-effectiveness of different levers, would go a long way to contributing to the design of effective interventions for poverty alleviation.

Future research could also address values and outcomes that are central to other Sustainable Development Goals. For example, reviews could examine how forest sector interventions affect rights, equity, adaptation and resilience, or carbon sequestration. The interactions among these additional outcomes and poverty alleviation is ripe for investigation; more broadly, future research might also ask, "[how] can inclusive, equitable and sustainable forest management contribute to poverty alleviation?"

5.9 Conclusions

Forest-reliant communities are variously (and sometimes simultaneously) affected by rights-based, regulatory, market and supply chain, and forest and tree management levers within com-

plex socio-environmental landscapes. Different actors, including governments, communities, private sector organisations and NGOs, variously develop, fund and implement these levers. Teasing apart and isolating the effects of any one lever on poverty alleviation is challenging given available evidence. That said, there is evidence to demonstrate that some interventions – including ecotourism and community forest management – can have detectable and significant impacts on poverty reduction, while many studies show that many

of the reviewed levers have had positive impacts on poverty mitigation. To add to a rich body of case study research, further studies that explicitly focus on poverty reduction as an outcome of interest and that isolate causal mechanisms, including through quantitative methodologies with robust counterfactuals where appropriate, could help to extend this understanding of how forest-sector policies, programmes and strategies can help to alleviate poverty among the rural poor.

5.10 References

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