

Understanding Forests' Contribution to Poverty Alleviation

A Framework for Interventions in Forested Areas

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Abstract

This paper develops a broad framework to conceptualize the multiple ways forests contribute to poverty reduction and inform interventions in forest landscapes. The paper identifies five key strategies for reducing poverty in forest landscapes: (a) improvements in the productivity of forest land and labor; (b) strengthened community, household, and women's rights over forests and land; (c) regional complementary investments in institutions, infrastructure, and public services that facilitate poverty reduction for

the forest poor; (d) increased access to markets for timber or non-timber forest products; and (e) mechanisms that enhance and enable the flow of benefits from forest ecosystem services to the poor. The practical utility of the framework is tested through a portfolio review of forestry lending by the World Bank Group, the largest public investor in the forestry sector. The paper concludes with a discussion of some key issues that need to be addressed for forest-related investments in poverty reduction to succeed.

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1. Introduction

In developing countries, many efforts to conserve forests revolve around the legitimate enquiry of how poor forest-dependent households can be supported (Wunder 2001, Wunder *et al.* 2014, FAO 2006). Deforestation and forest degradation are difficult to address without tackling the economic needs of households who live in and around forests (Colfer *et al.* 2015, World Bank 2016a). Often, conservation efforts can limit access to land for agriculture and forest products, introducing trade-offs between reducing poverty and saving trees (Angelsen 2009). Thus, several leading conservation and development agencies have tried to minimize these trade-offs by investing in a series of ideas ranging from Integrated Conservation and Development Programs in the 1980s to plans for Reduced Emissions from Deforestation and Forest Degradation (REDD+) more recently. While many poverty reduction activities have met with uncertain success because of limitations posed by the geography and resources available in forested landscapes (Sunderlin *et al.* 2005, Wunder 2001), there are useful lessons to learn from these experiments.

For many households, particularly those in remote, forested locations, the movement from poverty to relative prosperity is likely to be a slow, even inter-generational, process. One economic strategy for such households is resource extraction (Angelsen 2010, Pacheco 2009, Fisher 2004). Many smallholders use forests for food, timber and other economic benefits (Brack *et al.* 2016, Hosonuma *et al.* 2012, Sunderlin *et al.* 2005).¹ But whether such extractive activities contribute to *sustained* poverty reduction remains uncertain (Fisher 2004). Where growth in markets for forest products contributes to income generation, it is somewhat unclear what actions enable some households to move up the economic ladder (Angelsen and Wunder 2003, Scherr *et al.* 2004). Even less is known about the influence of forest-related interventions on household asset accumulation under differing socio-economic conditions. If we peer within households to focus on gender asymmetry, pathways out of poverty for women, who are often the most forest-dependent, are particularly obscure (Mwangi *et al.* 2011, Colfer *et al.* 2016).

These issues are important from an environmental sustainability point of view. Deforestation and forest degradation are difficult to address without tackling the economic needs of households who live in and around forests (Colfer *et al.* 2015, World Bank Group 2016a). Thus, conservation and development agencies have invested in a series of ideas – ranging from integrated conservation and development programs in the 1980s (Brandon and Wells 1992) to plans for Reduced Emissions from Deforestation and Forest Degradation (REDD+) (Corbera and Schroeder 2011, Angelsen 2008) more recently. The poverty reduction components of such activities have met with uncertain success, often because of limitations posed by geography and resource availability (Sunderlin *et al.* 2005, Wunder 2001). Nonetheless, there are useful lessons to learn from these experiments. Further, a comprehensive approach that builds on the multiple,

complementary strategies that poor households in remote geographies use to prosper may provide additional insights.

From a poverty reduction and economic development perspective, the lack of clear evidence on pathways to prosperity for the forest-dependent poor poses important practical questions.² Should policies and programs promote non-forest opportunities for the poor or should existing uses of forests be strengthened? Can forestry productivity be adjusted such that the gains from timber harvests, non-timber forest products (NTFPs) and ecosystem services accrue to poor households? Do forest reforms strengthening community and indigenous rights enable poverty reduction? And, what risks do poverty-reducing economic investments pose to forests? These questions are not new (Wunder 2001, Sunderlin *et al.* 2005), and a rich literature has developed identifying the income that the poor obtain from forests (Cavendish 2000, Vedeld *et al.* 2007, Angelsen *et al.* 2014) and the role forests play in supporting food security and providing a safety net (Pattanayak and Sills 2001, Wunder *et al.* 2014). There is also growing evidence of the importance of forest ecosystem services in securing clean water, decreasing erosion and reducing the effects of storms (Bennet *et al.* 2009, Barbier *et al.* 2011, Braumann *et al.* 2007) - benefits that are particularly important to the poor. We build on this literature to ask what critical investments in people, resources and institutions can enable forests to go beyond a supportive role and play an even bigger part in poverty reduction.

In forest landscapes, households may be stuck in location-determined poverty traps, making it difficult for them to emerge from poverty even amid country-wide growth and economic development (Jalan and Ravillion 2002, Kray and McKenzie, 2014; Barbier and Hochard 2016). In such remote rural areas, poverty reduction may require strategies aimed at overcoming geographic constraints (World Bank, 2007; Barbier and Hochard 2016). Thus, in forested locations, it is important to ask a) how different economic goods and services from forests (e.g., timber, NTFPs and ecosystem services) can better support poverty reduction, and b) what complementary investments may enable the poor to overcome location-based limitations and profit from forest resources.

Over the years, many government and non-government organizations (NGOs) have made forest-related investments. For instance, overseas development assistance in forestry and related activities doubled in the six-year period of 2002-04 to 2008-10, from approximately USD 560 million to USD 1.26 billion (Agrawal *et al.* 2013). The World Bank Group (WBG), which invested a total of USD 6.5 billion in forestry activities during 2002-2015 (World Bank 2016a), is the leading public funder of forestry and conservation in developing countries.³ As of 2015, the World Bank had 106 active projects related to forest-based activities (World Bank Group 2016a).⁴ Furthermore, the WBG continues to provide strong support for developing countries to achieve poverty reduction. In 2016, the World Bank Group committed nearly \$64.2

billion in loans, grants, equity investments, and guarantees to its members and private businesses (World Bank 2016c). Its large forestry investments and mandate to reduce poverty make the WBG an important institution for the future of forests and forest-dependent peoples.

In this paper, we propose a conceptual framework to address forest-poverty challenges that builds on an understanding of the economic behaviors of households. Arguing that investments in forests can contribute to poverty reduction if the benefits from timber, NTFPs and ecosystem services accrue to the poor, we identify five potential areas of investment in forest landscapes that can increase the contribution of forests to poverty reduction. We examine key findings in relation to these five areas as reported in the literature, and how they are covered in World Bank forest projects through a portfolio review. In addition, we separately examine gender-related implications. We conclude with a discussion of key issues that need to be addressed for forest-poverty reduction to succeed.

2. Investing in Poverty Reduction in Forest Landscapes

Many rural households move out of poverty by pursuing one or more of three main strategies: agricultural entrepreneurship, obtaining off-farm jobs or migrating (World Bank 2007, Barbier and Hochard 2008, Schneider and Gugerty 2011). Diversification of income sources is a very important factor in moving households out of poverty (Krishna 2010, ILO 2014). However, remote forested areas offer limited opportunities to improve the returns to land or undertake off-farm jobs. Coupled with the high costs of long-term migration, households in such areas can be stuck in poverty-environment traps (Barbier and Hochard 2016, Barbier 2016). Typically, such geographic poverty traps occur when the characteristics of certain remote regions make household investments less productive relative to non-remote areas (Jalan and Ravillion 2002, Kray and McKenzie, 2014; Barbier and Hochard 2016).

Rural households participate in diverse livelihood strategies in response to their own assets and abilities, and the risks and opportunities that they perceive (Barrett *et al.* 2011, ILO 2014). Thus, poverty reduction in remote forested areas will largely depend on improving household capacity, productivity of private and commonly-held assets, including agricultural land and forests, reducing risks and improving access to new jobs or out-migration opportunities. Both household-specific and public investments can make it easier for the poor to diversify their economic strategies and increase the returns to livelihood strategies.

Many poor households living in forested areas rely on timber and NTFPs to meet a significant part of their nutritional, energy and housing needs (Wunder *et al.* 2014, Angelsen and Wunder 2003). Forest resources also serve as an input to agricultural and livestock production systems (Cavendish 2000) and

smooth consumption by acting as an insurance-type mechanism (Pattanayak and Sills 2001). Furthermore, ecosystem services, such as storm-protection services of mangroves, can make poor communities less vulnerable to natural disasters (Das and Vincent 2009). While these safety net aspects of forests are important to ensure that poor households do not fall further into poverty, this paper focuses on the kinds of policies and interventions that help people climb out of poverty (Barrett 2005). The critical question to address then becomes: what investments in people, resources and institutions can enhance the benefits obtained from forests so they can play an even bigger role in poverty reduction?

We use the acronym PRIME to examine five possible areas in which communities, governments, development agencies, NGOs and civil society organizations (CSOs) can invest to see greater poverty reduction in forest landscapes. PRIME argues for: a) improvements in productivity (P) of forest land and labor; b) strengthened community, household and women's rights (R) over forests and land; c) complementary investments (I) in institutions and public services that can facilitate forest resource use; d) increased access to markets (M) for timber or NTFPs; and e) mechanisms that enhance and enable the flow of benefits from forest ecosystem services (E) to the poor. Several of these strategies may have to occur at the same time for the forest-dependent poor to be able to capitalize on forest resources.

Figure 1 illustrates the PRIME approach and some of its sub-components. We focus on forest-related strategies as other important economic development tactics, such as agricultural development and broader job generation, are beyond the scope of this paper.

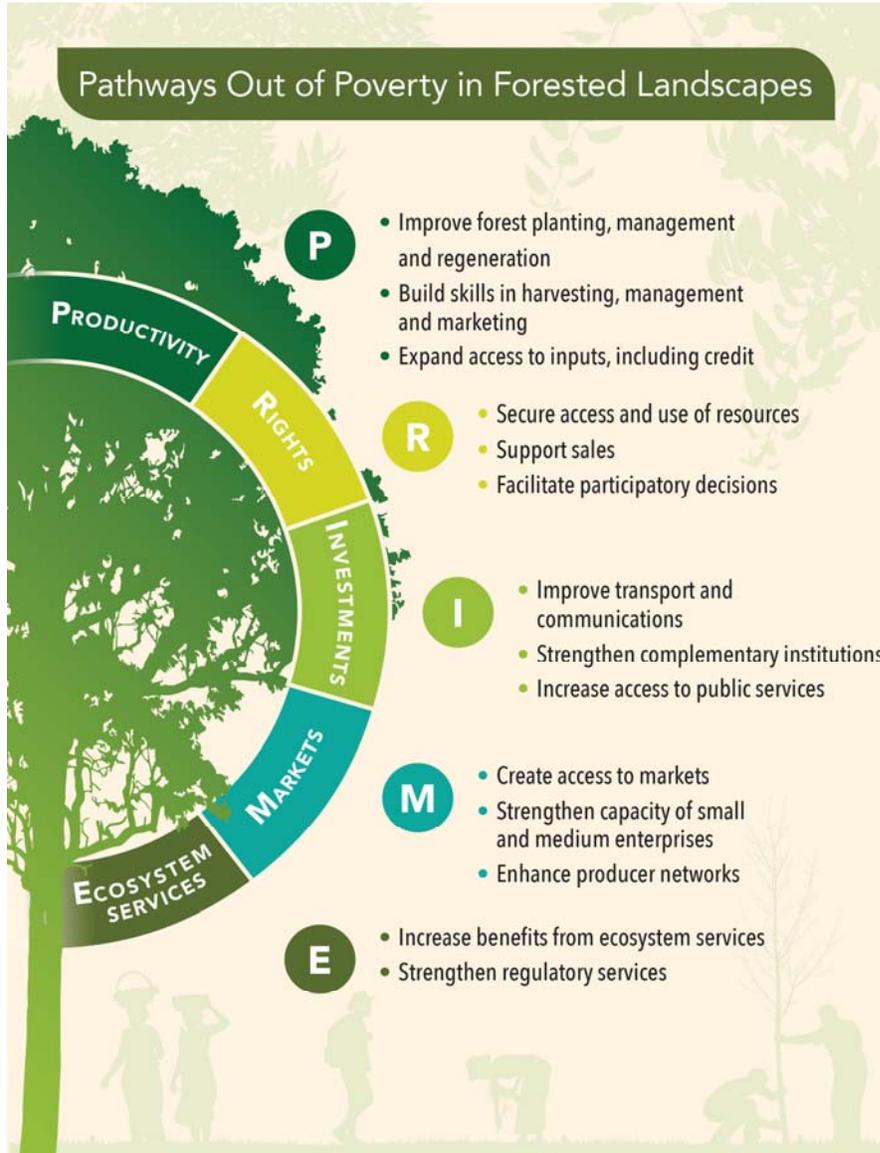


Figure 1: The PRIME framework

Productivity. Growth in land and labor productivity is integral to rural development (Irz *et al.* 2001, de Janvry and Sadoulet 2010). Forestry has some challenges that go beyond what is faced in small-scale agriculture based economic development. Timber operations, for instance, require long-term investments and economies of scale to be financially viable and the returns to NTFP management can be uncertain. These factors can potentially be overcome by improving individual and community skills in harvesting, monitoring and regenerating forest products.⁵ Resource productivity can also be improved through better forest management and the infusion of capital, for instance, portable saw mills.

Rights. A second strategy is to increase the wealth of the poor by strengthening their rights (R) over natural capital. Secure rights can reduce uncertainty over resource access and allow households to make longer-term investments (Meinzen-Dick 2009, FAO 2011). In the last several decades, the emergence of community-based forest management has given poorer communities greater say over forest use (FAO 2016). This has happened through power-sharing agreements with the state, increased legal access and decentralization within national agencies (Chhatre and Agrawal 2009, Shyamsundar and Ghatte 2014). Investing in resource rights has implications for many the most marginalized people, including women and indigenous communities (Agarwal 2009, Colfer *et al.* 2015, World Bank 2016c).

Investments. Poverty reduction in forest landscapes will not be possible without investments (I) in institutions that govern forest use and public infrastructure and services such as transport, electrification and health facilities. Institutions, policies and bureaucratic rules that are anemic to forest enterprises can make it costly for households to use forest resources for income generation (Pacheco 2012, Ros-Tonen and Kusters 2011). Moreover, poverty in remote rural areas is partly a result of limited access to public services, which can inhibit the growth of market-oriented activities (Kray and McKenzie 2014; Barbier and Hochard 2016). Geographic constraints will also limit the supply of ‘off-forest’ jobs. Without access to reasonable public goods and institutions that facilitate forest enterprises, the poor in forested hinterlands will not be able use forests to increase or diversify their income (World Bank 2007).

Markets. Creating access to markets (M) is a well-established conduit for jobs and income generation in rural areas. Forest-dependent communities have long used forest resources for subsistence purposes and some have also connected to markets. For instance, markets for a small number of high-value NTFPs (e.g. Brazil or Shea nuts) have significantly benefited men and women in poor households (Colfer *et al.* 2015). And as for timber, gaining certification and access to export markets are important economic strategies. For this approach to succeed, more needs to be done to strengthen small and medium enterprises (SMEs) by increasing their access to credit, technologies and marketing networks.

Ecosystem Services. A final opportunity is to strengthen the flow of benefits from forest ecosystem services (E) to the forest-dependent poor. Ecosystem services can enhance the productivity of land, improve environmental quality and reduce risks (Miura *et al.* 2015, Munang *et al.* 2013, Renaud *et al.* 2013). Over the last decade, there have been attempts to better manage ecosystem services by enhancing their value through policy instruments such as payments for ecosystem services (PES), carbon markets and investments in eco-tourism businesses (MEA 2005, Bulte *et al.* 2008, Alix-Garcia and Wolff 2014). While we acknowledge the many critical non-monetary services provided by forests, this paper focuses on strategies to channel the demand for ecosystem services into direct income gains for the poor.⁶

In the following sections, we scrutinize the viability of these five poverty-reduction strategies based

on a review of literature and the World Bank's forestry portfolio. How gender links to these five intervention areas is also examined. We use publicly available and internal reports, journal articles and interviews with World Bank task team leaders to assess the potential usefulness for forest landscape project and program designers and others who could potentially apply the PRIME framework.

3. The PRIME Framework

The goal of the PRIME framework is to enhance our understanding of the links and complementarities between different types of investments towards poverty reduction in forest landscapes. In this section, we examine what we know about each strategy.

1. Income generation by improving skills and productivity (P)

Improvements in forest and labor productivity can become a pathway out of poverty when either resource extraction is sufficiently profitable or the returns to labor are high enough that they contribute to wealth accumulation. Currently, some 31% of the world's forests are designated as primarily production forests and an additional 28% are multiple-use (FAO 2015). Plantation forests are a small proportion of overall forest area (7%), but their share is growing, as are smallholder plantations (FAO 2006b). Increasing the returns to plantation and production forestry may require better management of natural forests for timber and NTFPs, use of best practices in plantations and agroforestry as well as fire, pest and disease control. Improving smallholders' skills in harvesting, management and product marketing will also be important.

Timber is commercially the most important product in most forests, generating a gross value added of USD 606 billion in 2011 (FAO 2014). However, some fundamental characteristics of the sector create barriers to entry for the poor. Timber planting, harvesting and processing is a long-term capital and technology-intensive investment that requires secure tenure (Angelsen and Wunder 2003), exhibits economies of scale (Wunder 2001) and may require access to specialized markets (Angelsen and Wunder 2003, Belcher and Kusters 2004). It is, thus, no wonder that the poor are excluded, especially given the sector's high regulatory burden and complex political economy (Belcher 2004). Further, large-scale timber enterprises often do not provide formal employment to local community members and can even marginalize them (McKenney *et al.* 2004, Mayers 2006, Blaser and Zabel 2015).

Smallholder forestry could provide a pathway out of poverty, but poor households and communities often do not have the forestry skills to take on tree management (Rohadi *et al.* 2010) or the business management skills to negotiate good deals with logging companies (Pacheco 2012, Medina *et al.* 2009). Thus, in some cases, it is more profitable for communities to work for logging companies than to harvest

on their own with the support of well-meaning NGOs and donors (Medina *et al.* 2009). In Brazil, where there are examples of profitable small-scale timber production, technical and credit support are critical elements of success (Humphries *et al.* 2012). Technical support, in particular, can be critical. A case in point is the cultivation of bamboo in Southern China, where household income could potentially double by improving productivity, reducing post-harvest losses and increasing market effectiveness (Hogarth *et al.* 2013, Hogarth and Belcher 2013). The paper by Sanchez-Badini *et al.* (forthcoming) discusses some of the factors that contribute to productivity gains.

2. *Wealth accumulation through rights and empowerment (R)*

Communities use private, public and communally-held forest lands to meet livelihood needs. Globally, 76 percent of global forests are controlled by governments,⁷ with the other 24% managed by communities and the private sector (FAO 2015). Community control over forests has increased, from 21% in 2002 to 30%, in 2013 – a trend that is largely driven by changes in Latin America and China (RRI 2014).⁸ This is good news, as there is increasing evidence that strengthened indigenous and local community rights over forests can contribute to improved forest outcomes (Chhatre and Agrawal 2009, Robinson *et al.* 2014, Persha *et al.* 2011, Shyamsundar and Ghate 2014).

Security of tenure and rights over forest resources is important because it can promote investments, increase productivity and contribute to social standing (Meinzen-Dick 2009).⁹ However, does empowering the poor with better rights over forests reduce poverty? There is little quantitative evidence to provide a direct answer to this question; and, rights, by themselves, are inadequate if the poor face other significant barriers (Delville 2010).¹⁰ Nonetheless, secure rights and contracts are foundational for sound economic development (FAO 2011).¹¹

While there are many ongoing attempts to strengthen local rights over forests, the effectiveness of such policies can be undermined by burdensome legal requirements, the heterogeneous needs of communities and the costs associated with co-management with the state (Cronkleton *et al.* 2012). Often, reform-based legal access to resources is correlated with factors such as education, location and income. Thus, tenure reform can hurt the less-educated poor, particularly if it fails to consider the customary, secondary and informal rights that the poor may have (Meinzen-Dick 2009).¹² Further, where households sell forest products, the benefits from reforms depend on the capacity of communities to successfully engage with markets (Pacheco 2012). Based on a ten-country study, Larson and Dahal (2012) argue, for instance, that rights do not necessarily translate to livelihood improvements unless they are backed by other economic measures. One such measure may be secondary organizations or federations that can lobby for local communities (Paudel *et al.* 2012).

3. *Investing in complementary public services and institutions (I)*

A sizable literature points to how improvements in public services and the performance of public institutions can enhance the productivity of traditional rural economic activities, increase access to new markets, and empower the poor (Barrett *et al.* 2011, Barbier *et al.* 2016). There is strong evidence of the positive impacts of roads, electricity, health care and other services on poverty reduction (Deininger and Okidi 2003, Chomitz 2007, Khandker *et al.* 2013, van de Walle *et al.* 2015). In addition, institutions that provide clarity over laws, lessen regulatory and financial constraints and provide social support can help reduce barriers for market exchange and empower households to take reasonable risks. Well-performing institutions and public services that ease regulatory constraints are particularly important for market-based transactions in remote forest landscapes (Pacheco *et al.* 2016, Mirjam and Kusters 2011).

Although the usefulness of the “I” in PRIME for poverty reduction in forest landscapes is generally clear, forest safeguard issues are a consideration. A principal worry with investments such as roads, for instance, is that they can contribute to deforestation by increasing access to logging, bringing in secondary settlements or attracting migrants (Angelsen 2010, Chomitz 2007). Furthermore, the responsibility for economic development in forest landscapes often falls outside the mandate of forestry agencies, making it difficult to develop appropriate policies.

4. *Improving Market Access (M)*

Recent trends have opened new opportunities in timber and non-timber markets for poor households. Greater devolution of forest management to local communities has enhanced their access to resources. In addition, technological changes in the plywood and paper industry and the introduction of portable sawmills have made small-scale producers and plantations more competitive (Angelsen and Wunder 2003, Scherr *et al.* 2004). Small and medium enterprises (SMEs) focusing on carpentry, woodworking, and weaving, etc. also provide important off-farm and peri-urban employment (FAO 1987, Arnold *et al.* 1994). However, these new technologies and market opportunities may further increase pressure on forests by increasing demand for ‘any tree of any size’ (Angelsen and Wunder 2003, Belcher and Kusters 2004).¹³

One possibility for achieving both poverty reduction and sustainability is to access the growing market for certified timber through, for example, the Forest Stewardship Council (FSC) (Rametsteiner and Simula 2003, Romero *et al.* 2013). The area under international forest certification has risen from 14 million ha in 2000 to 438 million ha in 2014 (FAO 2015). However, participation in certification schemes can be cumbersome for the forest-dependent small enterprises (Molnar 2004), unless they band together under community forestry enterprises (CFEs) and receive external support (FSC 2004, Antinori and Bray 2005).

CFEs can help address many certification challenges related to the scale, quality and sustainability of timber management and associated transaction costs (Molnar 2004, Wiersum *et al.* 2011; Burivalova *et al.* 2016).

Production and marketing of NTFPs, such as medicinal plants, bush meat, nuts, and honey, play a key role in supporting the incomes of many poor households (Neuman and Hirsch 2000, Angelsen *et al.* 2014). However, commercially successful NTFPs are relatively rare because they require a high value-weight ratio, low product adulteration and a stable resource base and market (Angelsen and Wunder 2003, Belcher *et al.* 2005).¹⁴ Moreover, poor households often obtain a small share of the final benefits due to high regulatory burden, weak bargaining power (Sunderland and Ndoye 2004) and exploitative market chains (Rasul *et al.* 2008, Shackleton and Gumbo 2010).¹⁵ One strategy to expand market access for NTFPs would be to register them under Geographical Indication, an intellectual property recognized by the WTO (Egelyng *et al.* 2016).¹⁶ Such ‘origin’ markets, like certification schemes, will need support to be successful.

Lastly, wood-based fuels offer another opportunity to increase market access for the poor, as they play a critical role in meeting their energy needs (FAO 2014) and require few skills or technology to enter the market (Angelsen and Wunder 2003). The employment potential through small-scale wood collection, charcoal production, transportation, and last-mile retail is substantial (World Bank 2011), with the charcoal sector in Sub-Saharan Africa alone employing around seven million people. While these typically informal markets can be legalized and made more pro-poor,¹⁷ such formalization may become a threat to forests (Makonda and Gillah 2007, FAO 2010, Zulu *et al.* 2013). Thus, sourcing fuelwood and charcoal as a by-product of land clearing or through tree planting on farms (Angelsen and Wunder 2003) may be critical.

In all the markets discussed above, the poor clearly face challenges in both entering the market and extracting sufficient rent from the sale of forest products. A strategy to surpass some of these barriers is for smallholders to organize themselves into self-governing forest producer organizations (FAO and Agricord 2012 and 2016, Macqueen 2013). These offer members political and economic services, including lobbying for policy changes, economies of scale, information on prices and quality requirements, capacity building, and better linkages to government institutions, the private sector, financial institutions and development agencies (Hajjar and Kozak 2017).

5. *Ecosystem services for poverty reduction (E)*

Forests provide critical ecosystem services, including water regulation and filtration, carbon sequestration, erosion control, pollination, biodiversity and storm protection (Canadell and Raupach 2008, MEA 2005, see Cohn *et al.* in this issue). An increasingly common strategy for managing these services is to construct markets that protect ecosystems while providing income for local communities. Payments for ecosystem services (PES), for instance, have developed in many countries to internalize the value of

ecosystem services (Bulte *et al.* 2008, Alix-Garcia and Wolff 2014). A well-known global example is REDD+, a forest-PES program for carbon capture and storage. Another market-driven approach to increase economic benefits from ecosystem services is nature-based tourism, which has emerged as a driver of growth in many developing economies (Hall 2007, Narain and Orfei 2012). While the WBG has invested in nature-based tourism, here we focus on pro-poor opportunities and challenges provided by PES.

PES was originally conceived to manage natural areas but is now also viewed as an instrument for rural poverty reduction (Landell-Mills and Porras 2002; Pagiola *et al.* 2005). Scholars caution that it takes careful design to achieve even one of these goals (Alix-Garcia and Wolff 2014, Milder *et al.* 2010, Wunder *et al.* 2008, Pagiola *et al.* 2005). For instance, it may be more cost-effective for PES programs to target a few sellers, a strategy that will likely favor payments to larger landowners. In addition, areas that deliver important ecosystem services may not overlap with where the poor live (Ferraro 2008, Fisher 2012, Robalino *et al.* 2014). A case in point is China's Grain for Green program, which increased soil organic carbon (Song *et al.* 2014), but with moderate impacts on poverty, possibly because the selection criteria prioritized off-site soil erosion rather than poverty reduction (Uchida *et al.* 2007). In addition to such design issues, PES participation and the benefits accruing to the poor depend on household characteristics and the opportunity and transaction costs that households face (Pagiola *et al.* 2005, Bulte *et al.* 2008, Wunder 2008).¹⁸

How PES can meet both environmental and poverty reduction goals is an important issue, particularly in the context of global-scale carbon payments that REDD+ seeks to make. WBG experience suggests that it is crucial to design inclusive systems that are mindful of unexpected consequences for the poor. However, PES is more likely to be a pathway out of poverty when forests associated with high deforestation risks are owned or managed by the poor. This may require creative strategies to address challenges posed by insecure tenure.

Finally, PES is only one of many strategies aimed at conserving ecosystem services that have implications for poverty reduction. Evidence from Thailand and Costa Rica, for instance, suggests that protected area systems can contribute to poverty reduction through tourism growth and other investments that may have come in because of protection (Andam *et al.* 2010). Regulating services from forests is also clearly important for maintaining not only livelihoods but also productivity in agriculture, agroforestry, hydropower and other sectors (Ricketts *et al.* 2004, Cohn *et al.* forthcoming).

4. Empowering Forest-Dependent Women

PRIME offers a broad conceptual framework for creating opportunities for the poor as household units. However, a great deal of inequality lies within households. How, why and where men and women access, use and manage forests differs across the world.¹⁹ Globally, women contribute just as much to households' forest income as do men.²⁰ However, evidence from the Poverty and Environment Network global study points to distinct male and female roles in collecting forest products that vary across regions (Sunderland *et al.* 2014). In Africa, women are the main collectors of subsistence-oriented forest products; whereas in Latin America, men dominate firewood collection. And in all regions, men are more involved in hunting, wood harvesting, and minerals extraction.

Persistent gender gaps in access to services, markets and value-addition activities, land and tree tenure, voice and agency, and hiring labor result in forestry program outcomes that often marginalize women (Colfer *et al.* 2016).²¹ Thus, appreciating gendered differences matters for both fair and effective design of interventions and institutional arrangements. For instance, Agarwal (2009) shows that enhancing women's presence in community forestry institutions improved resource conservation and regeneration in Nepal and India. Yet, in East Africa and Latin America, forest-user groups that were predominantly female were found to perform less well than mixed or male-dominated groups, due to gender bias in technology access and dissemination, women's labor constraints and limitations in women's sanctioning authority (Mwangi *et al.* 2011). Thus, gender analysis is critical to identify gender gaps that may be important for both an efficient and fairer distribution of outcomes.

There are many constraints to achieving gender-sensitive outcomes in forest and agroforestry efforts (Kiptot 2015, Colfer *et al.* 2015). Common challenges include gendered norms and cultural prejudices that reinforce forestry as a male profession, lack of evidence-based research and gender-disaggregated data, limited technical capacity and budgets to implement gender-focused activities and women's limited representation in decision-making (Buchy 2012). Overcoming these challenges may require changing norms and management practices that go beyond the forestry sector. Successful strategies have included participatory consultations to discuss gender gaps in forest policies and practices (Aguilar *et al.* 2011), creating gender working groups and learning networks (Gurung *et al.* 2011, WOCAN 2016, Agarwal 2015), taking gender-transformative research approaches (Colfer *et al.* 2016), re-engineering management structures and setting up gender-sensitive monitoring and evaluation systems (Buchy 2012, WOCAN 2016) as well as institutional arrangements supporting equitable benefit-sharing (Shames *et al.* 2012).

5. The World Bank's Forestry Portfolio

To test the PRIME framework and the extent to which the five pathways are covered in forestry investments, we undertook a portfolio review of World Bank forestry projects. Our goal was to assess where forest investments were being made, the extent of the investments and the types of activities undertaken and, ultimately, how they addressed PRIME aspects towards poverty reduction in forest landscapes.

Since the adoption of the WBG Forest Strategy in 2002, 88 of the 309 projects with a forest component went through a full project cycle from fiscal year 2002 to 2015, i.e. they were approved, fully implemented, and brought to closure. These projects accounted for around US\$ 1.2 billion in loans, credits, and grants specifically allocated to forests.²² For our analysis, we examine a subset of this portfolio, focusing on 40 projects that made significant interventions in the forestry sector. Our sample included a subset of forestry projects from the World Bank's public project database that met four criteria: a) relatively recently undertaken projects (approved after 2002); b) completed projects with a results assessment available; c) WBG funding for the forestry-related components amounted to at least US\$ 0.5 million and was thus sufficiently large to include hands-on interventions; and d) at least 20 percent²³ of each intervention was in the forestry sector, ensuring the project's relevance for the sector.

Project information was extracted from two standard documents prepared at the beginning and end of each WBG project: The Project Appraisal Document and Implementation Completion Report. For each project, the summary descriptions of project components were reviewed along the main results indicators. If this summary information was insufficient to clarify the content of a project component or its beneficiaries, then the PAD and ICR were reviewed in greater depth.

To determine whether and where project components aligned with PRIME, the decision criteria listed in Table 1 were applied. For example, for an intervention to be counted under "R", rights had to be strengthened either informally or formally through a law or regulation. However, the mere inclusion of community members in the design, implementation or monitoring process of a project component did not count, even if it may have *de facto* strengthened their rights over forests and land. Explicit efforts to make forest decision-making bodies, e.g. forest groups, more inclusive and effective, were included here. Under "I", projects counted only if the regional complementary investment was supporting people's livelihoods in forest landscapes, for example through investments in improved telecommunication services to access markets, by improving access roads or through lowering the regulatory burden for small-scale forest enterprises. However, interventions were excluded if they supported macro-level reforms, such as the development of a national forest sector strategy. "M" interventions included actions aimed at enhancing market access, e.g. through marketing and logistics support, and value-addition activities. Market

infrastructure investments were excluded as they were captured under “I”. Lastly, for “E”, interventions such as payment for ecosystem services (e.g. REDD+) or developing nature tourism initiatives were included, but only if the returns for ecosystem services supported livelihoods, i.e. by creating additional jobs or commercial opportunities, and not if they solely had a conservation focus.

Table 1: Criteria for applying PRIME criteria to WB Forestry portfolio

Theme	Description of included interventions
Productivity	<p>Decision criteria:</p> <ul style="list-style-type: none"> • Include if the intervention boosts productivity through enhancements to forested land, machinery or labor. • Exclude if the intervention focuses on enhancing agricultural or other non-forest sector productivity. <p>Examples:</p> <ul style="list-style-type: none"> • Training individuals or communities in forest management (e.g. planting, harvesting, monitoring), management of non-timber forest products and/or agroforestry production • Providing machinery and/or technology to enhance productivity, such as portable saw mills, seedlings, or fertilizer
Rights	<p>Decision criteria:</p> <ul style="list-style-type: none"> • Include if the intervention strengthens formal or informal rights (including decision-making processes) over forests/land. • Exclude if the intervention only includes participatory component in project design, implementation and/or monitoring. <p>Examples:</p> <ul style="list-style-type: none"> • Granting individuals and/or communities forest and tree ownership and/or use rights • Strengthening inclusive forest user groups
Regional complementary Investments	<p>Decision criteria:</p> <ul style="list-style-type: none"> • Include if the intervention provides complementary investments in institutions, infrastructure and public services at the regional level that support the forestry sector. • Exclude if the intervention supports broad-based institutional reform, such as the development of a national forest sector strategy or land use plan <p>Examples:</p> <ul style="list-style-type: none"> • Improving the functioning of forestry institutions, such as reducing bureaucratic/legal hindrances and streamlining of regulatory processes for small-scale forest enterprises or creating institutional mechanisms to enhance forest economic activities • Introducing safety net programs tied to remote forest landscapes • Improving rural connectivity, including transport and IT infrastructure to enhance forest livelihoods. • Increasing access to credit to support forest management, agroforestry or the production of NTFPs • Increasing capacity of forest agency staff
Market access	<p>Decision criteria:</p> <ul style="list-style-type: none"> • Include if the intervention enhances market access through marketing and logistics support or value addition • Exclude if the intervention improves infrastructure access to markets, such as through roads, as this is included in “I” <p>Examples:</p> <ul style="list-style-type: none"> • Introducing certification schemes for timber or origin products for NTFPs • Formalizing markets for sustainable charcoal and fuelwood production • Developing new/additional forest products and /or adding value to existing products • Creation of producer networks and cooperatives.
Ecosystem services	<p>Decision criteria:</p> <ul style="list-style-type: none"> • Include if the intervention enhances the returns from ecosystem services in an equitable manner, including monetary, such as REDD or other carbon sequestration payments, as well as non-monetary income from ecosystem asset or services • Exclude if the intervention is not livelihoods-oriented, i.e. if it has a conservation focus <p>Examples:</p> <ul style="list-style-type: none"> • Introducing payment for ecosystem services, such as REDD+ • Developing nature tourism initiatives that benefit local poor • Training on managing forest ecosystem services

Across the sample of 38 projects assessed, the average amount of WBG funding for each project was US\$ 33.45 million, including both grants and loans. The largest amount of funding for any single project was a credit of US\$ 108 million to India. The distribution of projects by the recipient country’s level of development was highly concentrated, with nearly 90%, among “lower middle” and “upper middle” income countries, under the WBG’s income status criteria.²⁴ Low income countries account for barely 1 in 10 projects (see *Figure 2*). Even if you consider that there are roughly twice as many lower middle- and upper middle-income countries than low-income ones, the share of forestry projects in low-income countries is disproportionately small and deserves more attention.

The geographic distribution of projects was approximately proportionate to each region’s population and development needs – with the exception of South Asia, which, despite accounting for nearly a quarter of the global population and having significant development needs, was the site of only one of the projects assessed. The distribution across regions is shown in *Figure 3*.

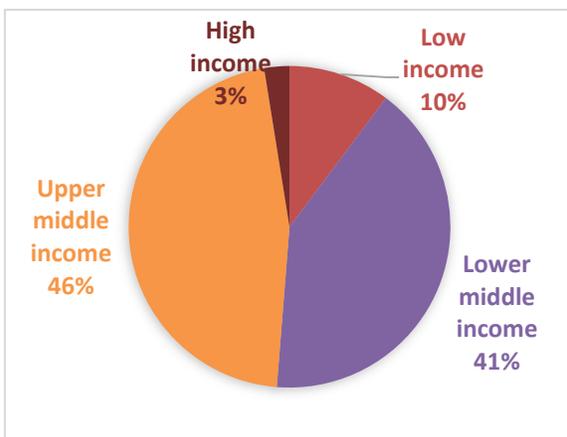


Figure 2: Distribution of projects in the WB forestry portfolio across countries per income level

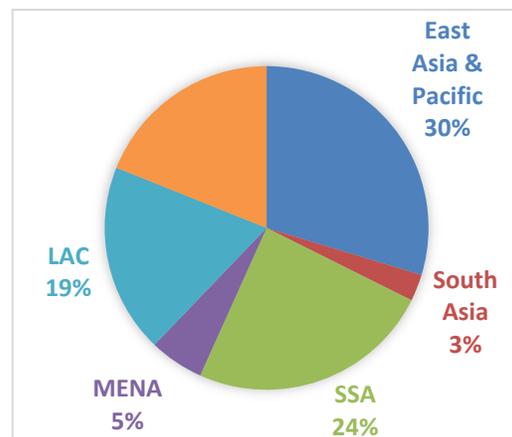


Figure 3: Distribution of projects in the WB forestry portfolio across regions

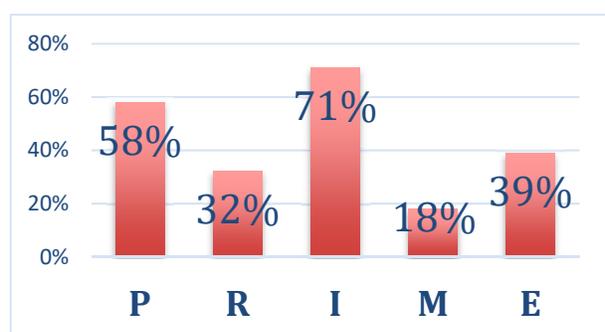
The average project featured 2.2 PRIME themes in its components and associated results indicators (Table 2). Nearly half of the projects included two PRIME themes and about one-fifth of the projects involved at least four themes. This supports the notion that PRIME themes are complementary, especially institutional strengthening (a component of I) with other interventions. 13% of projects were absent of any PRIME theme. These were projects in which the forest-related investments – in improved governance, training of officials, or infrastructure – were not sufficiently tied to livelihoods but rather focused on safeguarding natural systems.

Table 2: PRIME themes featuring in projects

PRIME themes per project	Share of projects
0	13.20%
1	7.90%
2	44.70%
3	13.20%
4	18.40%
5	2.60%

By a significant margin, the most common PRIME theme in the portfolio sample was complementary investments (I), which featured in 71% of the projects (Figure 4). This usually came in the form of support for institutional processes, personnel training or equipment at government forestry departments – with livelihoods or income enhancement of surrounding communities being a necessary goal of the investment in order for it to count.²⁵ Consistent with the prevalence of (I) in the portfolio sample was the common assignment of Public Administration – under the World Bank’s classification of sector themes assigned to each project – as a core area of the content and goals of nearly two-thirds (63%) of the projects.

Figure 4: Projects with different thematic coverage



Less common than the institutional and capacity strengthening elements of “I” described above were investments in direct support of forestry activities, such as transport or connectivity investments (I) or processing machinery (P). This pattern may reflect limited investments by the WBG in engaging directly in commercial forestry activities. Whether WBG projects in forestry should engage more actively in commerce and center more around communities, as opposed to natural systems, is a valid question, as views on the answer are certain to differ.

Complementary investments (I) was followed in frequency by interventions targeting productivity (P), in 58% of projects, rights (R) (32%), ecosystem service compensation (E) (39%), and access to markets (M) (18%). That compensation for ecosystem services was in a minority of projects may be explained in part by the consideration that carbon offset markets emerged in the latter half of the sample period and are conditional on carbon valuations, monitoring, payments systems and other factors that make carbon financing more difficult to implement than a productivity or government agency capacity building intervention. The same could be said of rights (R), which require legal changes and are regarded by some governments as an area that should not be significantly shaped by externally financed initiatives. That access to markets was rarely targeted in a significant way is an interesting finding. This outcome might share a cause in common with the limited presence of complementary investments in forestry infrastructure: the WBG’s history of limited involvement in the timber industry.

6. Conclusions

The PRIME framework highlights five potentially linked and complementary strategic areas of investment for reducing poverty among those living in and around forests. It offers an approach for clarifying where and how forest-related interventions and investments can potentially contribute to pathways out of poverty. By doing so, it also highlights inherent trade-offs and remaining knowledge gaps to be filled.

The portfolio review suggested that the PRIME framework can be an effective way to describe a number of key features of WBG forest-related projects and their complementarities. It also revealed issues with the way PRIME’s components are defined and delineated. For example, certification to facilitate the sale of timber in international markets is a discrete initiative, making it easier to identify and categorize (under M). Efforts to reform governance practices or provide additional resources to government staff, on the other hand, tend to have multiple goals with outcomes that are challenging to measure—such assistance could fall under multiple categories. This framework encourages users to clarify the outcomes being sought and link project or program activities, actions or strategies to those outcomes.

Institutional strengthening efforts often accompanied other PRIME interventions. This is not surprising, as governance improvement is a foundation of WBG interventions across sectors. Conversely, the relative rarity of market access and forestry-related infrastructure development interventions may reflect the challenges associated with directly supporting commercial activities in an industry that can be contentious—because the logging practices are deemed unsustainable or harmful to dependent communities, or there is a risk of aiding illegal logging or displacement of communities. Along these lines, the FAP notes that Development Policy Loans became increasingly uncommon in forestry after 2012 because of the widespread view that forestry projects were high risk. It can be noted that the share of projects in the E category will likely be larger in a few years' time, as many carbon offset programs are still ongoing. An explanation for the finding that forestry projects are rarest in low income countries was beyond the scope of the portfolio review, but it raises interesting questions about where forestry falls as a priority for the poorest countries and about whether their governance systems in key resource sectors are considered strong enough in the first place to absorb development assistance.

Success is likely to be conditional on complementary investments being made simultaneously. In our review of the literature, we found that successful poverty-related outcomes were facilitated by actions falling within several of the categories, such as government's granting long-term forest tenure to households, providing training to improve people's forest management skills and increasing access to credit and other complementary investments. Even if all five PRIME pathways are not present, an incremental approach can be useful; but there may be some path-dependencies. Without secure rights over resource extraction, for instance, interventions that support the supply of forest products to markets may fail. The PRIME framework is intentionally broad in scope, with the idea that it can be made much more specific when applied to a country or region. In each case, the framework can be used for developing a theory of change: the sequencing of interventions being determined by local contexts, scale of the intervention and available forest resources.

However, this framework still needs to be more fully tested to identify additional issues that are not being captured and theories of change relating to poverty reduction pathways in varied contexts. Efficient ways for testing and mainstreaming the use of this framework in WBG programming are currently being explored. The World Bank's Program on Forestry (PROFOR), for example, is asking their project leaders to apply this framework, as well as guidance on incorporating gender analysis, at the earliest stages of project and program design.

The strategies for poverty reduction through forest-related efforts and investments identified in this paper will be most effective if implemented within a multi-dimensional rural development agenda that seeks to tackle underlying structural, capacity and institutional-related issues faced by the poor. PRIME can be

an integral part of geographically-targeted poverty reduction strategies. Our review shows that capacity development is integral to improving productivity, stronger and equitable forest and land rights strengthen agency, and without effective public institutions and services, the poor cannot be expected to use their access to forest resources to escape poverty. Of course, communities have demands that go beyond income and the non-cash contributions of forests can be very important.²⁶ Our focus on gender analyses also points to the importance of understanding the implications of rural development strategies for women and men.

While the role forests play in enhancing rural resilience and food security is not fully addressed in this paper, social and environmental safeguards will certainly need to go hand in hand with any forest interventions that seek to reduce poverty. The FAO, CIFOR, IFRI and the WBG recently launched a global effort to develop a standard survey instrument, the Forestry Living Standards Measurement Survey, to measure forest use and the wellbeing of forest-dependent communities (FAO *et al.*, 2016). Combining such field-based surveys with participatory gender-disaggregated information and satellite data may ensure that forest sustainability and poverty are simultaneously monitored.

Over time, poverty reduction in forest areas will likely be no different than what is seen in agricultural areas: ‘off-forest’ jobs and migration (Hecht *et al.* 2016) will play a significant role in changing the relationship between forests and people. We see this in trends in forest villages in middle-income countries such as Turkey and Albania (World Bank 2016b, IOM 2016). Thus, strategies that enable communities to seek these jobs while simultaneously strengthening their ability to benefit from forest resources in a sustainable manner will be key.

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Endnotes

¹ Hosonuma *et al.* (2012), based on data from 46 countries, estimate that commercial agriculture accounts for 40% of deforestation and local/subsistence agriculture accounts for 33% of deforestation; timber extraction and logging account for some 52% and fuelwood collection and charcoal production (mainly small-scale activities, particularly in Africa) account for 31% of forest degradation.

² The term forest-dependent poor is commonly used to refer to households who ‘gain some form of benefits’ from forests (Newton *et al.* 2016). However, as Newton *et al.* (2016) argue, there are many definitions of ‘forest-dependent households’, making it difficult to compare such communities across studies or to get an understanding of the overall numbers of such populations.

³ Establishing the exact share of the WBG’s engagement is not easy since the WBG uses multiple instruments. IDA funds are related to other official development assistance from bilateral and multilateral sources, however, IBRD and IFC financing can be akin to non-concessional public and commercial financing.

⁴ The WBG’s investments are dwarfed by international private financial flows into forestry, which, however, mostly go to forests in North America rather than natural forests in developing countries. Private flows to forestry are estimated at USD 15 billion per year (Asen *et al.* 2012). Because of its mandate to fund forestry initiatives related to climate change, the WBG’s contributions to sustainable forest management may grow.

⁵ One concern with improving labor productivity is that it may result in higher benefits that accrue to a smaller number of more productive people.

⁶ Regulatory ecosystem services (e.g. soil retention, water regulation) underpin provisioning services (food, water, energy) from both forests and adjacent ecosystems.

⁷ This share increases considerably for Western and Central Africa (99%), Western and Central Asia (98%), and South and Southeast Asia (90%).

⁸ Forest land brought under community ownership during 2008-2013 is less than 20% of what was secured in the previous six years. In addition, much of the handover to communities has happened in Latin America and China. In peninsular and archipelagic South East Asia and the Congo-Basin, for instance, states retain legal control over 98, 75 and 99% of forests. Further, implementation of tenure reforms are weak and do not provide strong security of tenure (Rights and Resources Initiative 2014).

⁹ The nature of rights (private, formal or informal) often matters less than the scope of the bundle of rights (use, management, exclusion and alienation) (Meinzen-Dick 2009). Informal rights can also induce investments, if social institutions offer security and private rights do not ensure investments (Delville 2010, FAO 2011).

¹⁰ A large global household survey (Jagger *et al.* 2014) finds that average forest incomes are lower in community-managed forests relative to state-managed forests. Such evidence does not, however, undermine the hypothesis that rights over forest resources can benefit communities; rather it reinforces a common understanding that communities are often handed over the least productive forests.

¹¹ Notably, for poverty reduction, rights may go beyond rights to forest products and include rights to lease land for gas pipelines, for example, or the right to mine underground resources, although these are the least likely rights to be handed over to communities.

¹² Initial evidence from Zambia, for instance, points to the possibility of elite capture in REDD+ projects, with tenure becoming more secure for the elite relative to more ordinary community members (Stickler *et al.* 2016).

¹³ Alongside improving access to markets, it will be critical to safeguard natural forests and promote other sources of timber, for example through smallholder forest plantations (Angelsen and Wunder 2003) and outgrower schemes with the private sector (Mayers 2000, Desmond and Race 2001).

¹⁴ Shea butter is Burkina Faso’s third most important national export and a key source of income to poor, often landless women (Schreckenber 2004). It contributes up to 40-60% to their income (Tincani 2013) and employs around four million women in trade and processing (Maiga and Kologo 2010).

¹⁵ In the few instances when a product can break the deadlock, more powerful external stakeholders tend to enter, driving out the poor who lack the required skills, resources, connections as well as market information to compete successfully (Angelsen and Wunder 2003, Belcher and Kusters 2004).

¹⁶ One such example is Oku honey from Cameroon, which is produced by groups of small-scale honey producers and marketed through cooperatives (Chabrol *et al.* 2015). After PGI registration in 2013, its price increased from 1,500 to 4,000 FCFA (USD 2.8-7.5) for a liter of processed honey and several new SMEs were created (WIPO 2014).

¹⁷ For example, in Mali, woodcutters benefitted when rural wood markets were formalized with harvesting quotas, identification of points of sale and oversight by a management agency (Gautier *et al.* 2005).

¹⁸ Wunder (2008) states that participation in PES programs is determined by owning enough “environmentally strategic land”; trusting the purchaser; having sufficient capacity to meet program monitoring/production requirements; and that payments exceed opportunity costs.

¹⁹ See Agarwal 2009, Bechtel 2010; Mai *et al.* 2011; Mwangi *et al.* 2011, Peach Brown 2011; Rocheleau and Edmunds 1997, and Jagger *et al.* 2014.

²⁰ This differs across regions. The share of overall income from processed forest products (e.g. furniture) is higher for men (61%) than women (25%) across the three regions (Sunderland *et al.* 2014). Women also collect more forest products than men from common property resources in Latin America and Asia, but not in Africa (Sunderland *et al.* 2014, Jagger *et al.* 2014).

²¹ And in some areas, men’s migration from rural areas has left women to assume the spectrum of agricultural and forest management roles, often without the resources or agency to do so successfully.

²² Forest Action Plan FY 2016-2020, World Bank Group 2016.

²³ When initiating a new operation, each task team indicates the various themes and sectors covered by the operation and reports their respective contribution (in percentage) with a sector code. One of the sectors is forestry.

²⁴ The income groups are determined by GNI per capita. Current thresholds are, in US\$:

Low income (L)	<= 1,005
Lower middle income (LM)	1,006-3,955
Upper middle income (UM)	3,956-12,235
High income (H)	> 12,235

²⁵ Some projects included investments that were approximately in line with the criteria of “I” but did not count because the activity and results funded had a conservation focus.

²⁶ These considerations maybe particularly significant in landscapes where indigenous communities are trying to manage forests to meet new as well as traditional needs.