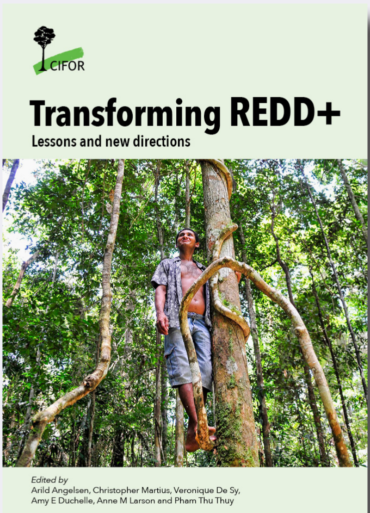
Chapter 9

National and subnational forest conservation policies

What works, what doesn't

Jan Börner and Thales AP West, with Allen Blackman, Daniela A Miteva, Katharine RE Sims and Sven Wunder



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What works, what doesn't

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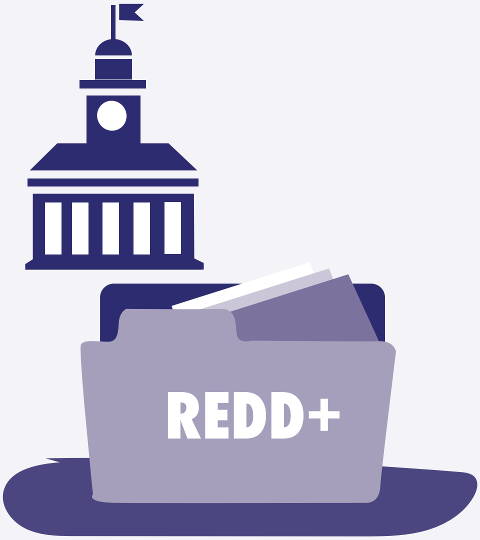
Key messages

- National and subnational policies contribute to forest conservation, but their effectiveness is low on average, especially in the tropics.
- No particular policy instrument stands out as a 'silver bullet'. Achieving the multiple objectives of REDD+ will require policy mixes that are sensitive to local contexts.
- More rigorous evidence on the effectiveness of forest conservation policies is needed, especially from Africa.

National and subnational forest conservation policies in a nutshell

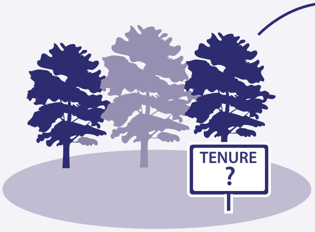


Originally planned as a national tool, REDD+ implementation has been dominated by subnational actors and civil society. Now, as countries finalise their REDD+ programmes, national policies are likely to dominate future implementation strategies.

National policymakers can achieve conservation goals through diverse strategies.

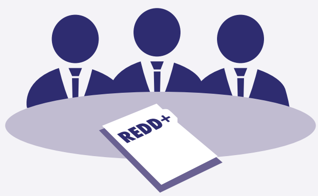
The most common strategy is to discourage deforestation through disincentive-based policies, the creation of protected areas or land-use restrictions enforced via fines, asset confiscation or jail.

Incentive-based policies such as payment for environmental services can encourage forest conservation and improve local livelihoods.



Enabling policies, e.g., land tenure regularisation, can create the necessary conditions for effective and efficient public administration and law enforcement.

Generally, national policies seem to work, but they are much less effective than anticipated. Where policies are effective, cost assessments suggest that investments did pay off.



To ensure national forest conservation policies continue to be effective, efficient and equitable, REDD+ will have to provide significant and stable long-term incentives to recipient country governments.

9.1 Introduction

REDD+ was initially conceived to be implemented through government-led policies at national and subnational scale (Pedroni *et al.* 2009; Angelsen 2017). However, when countries were preparing for REDD+, decentralised project-based pilot initiatives gained momentum (Minang *et al.* 2014; Sills *et al.* 2017; West 2016). Now, as countries begin to launch their REDD+ programmes, national policies are once more in focus.[1] These policies are key vehicles to implement REDD+ as a multi-objective tool for conservation and development, and are often aligned with pre-existing strategies and objectives (Brockhaus *et al.* 2014). Indonesia, for instance, has framed REDD+ as a green, sustainable, low-carbon development pathway (Di Gregorio *et al.* 2017), whereas Brazil's REDD+ programme, expected to be launched by 2020, represents a central component of the ongoing national plan to reduce deforestation (Box 9.1).

Such desired synergies between REDD+ and other conservation and development programmes could secure lasting REDD+ benefits, while reducing the overall cost of curbing deforestation and forest degradation effectively, efficiently and equitably (Angelsen 2008; Vatn and Vedeld 2013; Chapter 6). Focusing on these outcomes, we explore recent scientific literature on the impacts of policy instruments relevant to REDD+ that are implemented chiefly by governments at national and subnational levels.

Box 9.1 Forest governance reform in Brazil

Brazil is a conspicuous example of how national policies can achieve REDD+ objectives. Conservation policies reportedly contributed to reducing deforestation rates in the Brazilian Amazon by approximately 70% (Nepstad *et al.* 2014). Notably, impacts materialised after the federal government launched the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) in 2004 (Government of Brazil 2004). The plan helped to enact mostly existing legal frameworks in three thematic areas: (i) territorial planning and land-use policies, responsible for the creation of over 50 million ha of protected areas and homologation of another 10 million ha of indigenous lands between 2004 and 2011, and regularisation of thousands of rural private lots in the region; (ii) monitoring and law enforcement strategies assisted by satellite-based 'real-time' detection of deforestation (i.e., the Real Time System for Detection of Deforestation [DETER] programme) and; (iii) promotion of sustainable land-use activities (Government of Brazil 2013). While the PPCDAm is acknowledged as a central component of the forthcoming national REDD+ programme (Government of Brazil 2016), its implementation was followed by a political backlash in 2012 that weakened the legal basis for national forest law enforcement (Sparovek *et al.* 2012).

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1 The United Nations REDD+ programme (UN-REDD), which was established to support the implementation of national REDD+ initiatives, reported the number of partner countries grew from 9 in 2009 to 64 by 2017 (UN-REDD 2017). At least 6 countries have passed or amended a total of 15 new laws, regulations or decrees related to REDD+, and 15 countries have established 23 national or subnational platforms for multistakeholder engagement in REDD+ decisions (UN-REDD 2015). Similarly, the REDD+ Readiness Fund of the World Bank's Forest Carbon Partnership Facility increased its total disbursements from USD 3.5 million in 2009 to USD 42.9 million in 2017 (FCPF 2017).

National policy-makers can achieve REDD+ goals through distinct strategies (Boxes 9.1–9.3) that can be categorised as enabling, incentive or disincentive-based instruments (Börner and Vosti 2013). *Enabling policies*, such as land tenure regularisation, including the devolution of forest use rights, can create the necessary conditions for effective and efficient public administration and law enforcement. In some contexts, enabling policies strengthen the sense of land ownership, awareness and responsibility, thereby eliminating motives to clear forests in order to establish land-use rights. An increasingly popular strategy is to encourage forest conservation through *incentive-based policies*, such as payment for environmental services (PES) that potentially come with the co-benefit of enhancing local livelihoods. Finally, the most common strategy is to discourage deforestation and forest degradation through *disincentive-based policy* instruments, such as the creation of protected areas or land-use restrictions enforced via fines, asset confiscation, or jail.

The emerging evidence on the effectiveness of various policy instruments in achieving forest conservation and social co-benefits echoes earlier criticism of a 'silver bullet' approach to environmental policy design. Howlett contends that policy instruments should be wielded "…like the scalpel of a careful surgeon working on the body politic … [rather than]… the butchers cleaver, with little respect for the tissue of the patient falling under the knife" (Howlett 2004, 1). In fact, the effectiveness of the policy instruments reviewed in this chapter varies considerably both within and across instrument categories, as well as over time and across local contexts. Beyond the choice of policy instruments, other factors

Box 9.2 The Indonesian moratorium

In May 2011, the federal Indonesian government announced a moratorium prohibiting district-level agencies from granting concession licenses for selective logging or for the conversion of dryland forests and peatlands to palm oil or fast-growing tree plantations. It was enacted as part of Indonesia's National REDD+ Strategy, and supported by a USD 1 billion bilateral cooperation agreement with Norway (Angelsen 2017). Looking at the previous decade (2000–2010), Busch *et al.* (2015) estimated that Indonesian deforestation would have been 1.0–3.5% lower, had the moratorium already been in place. Contrary to government sources, Sloan *et al.* (2012) argued that the 53.5 Mha of dryland forests protected by the moratorium were inherently subject to low deforestation pressures when compared to similar unprotected areas and, hence, benefited only marginally from the conservation effort. Yet the 15.4 Mha of carbon-rich peatlands that were also protected by the moratorium benefited considerably from the intervention, since they experienced similar deforestation threats to other unprotected peatlands. Still, two years after the moratorium was enacted, ongoing political pressures and lobbying limited the land under protection from suppression or logging licensing to only 17–32% of the intended conservation areas (Sloan 2014). Recent work based on remotely-sensed forest fire data reported only negligible impacts associated with the moratorium (Groom *et al.* 2018). Notwithstanding recent extensions in the size and scope of the moratorium, results from impact studies have until now not been very encouraging – perhaps mostly due to the spatial targeting of the policy.

Box 9.3 Sustainable forest management in the Republic of the Congo

Declines in the Republic of the Congo's wildlife population during the 1990s led to implementation of its 2000 Forestry Code. Among other objectives, the Code aimed to mitigate forest degradation due to logging through the adoption of sustainable forest management (SFM) guidelines. The law assigned 54% of forests in the country as timber concessions and required concessionaires to develop and follow a government-approved forest management plan. Concessionaires were also encouraged to pursue Forest Stewardship Council certification, which imposes additional biological and social obligations regarding the management of forests, but grants access to restricted and international timber markets (Brandt *et al.* 2014). However, results from Brandt *et al.* (2014) suggest that the presence of SFM was immediately associated with higher deforestation in Congolese forests, apparently driven by higher legal timber production, foreign capital and international timber demand. In defence of the conservation policy, Karsenty *et al.* (2017) noted a problematic selection of comparison units in the former study, which likely led to a biased assessment of the SFM. As a result, the impacts of the Congolese policy on deforestation remain unclear (Karsenty *et al.* 2017).

such as design, implementation context and timing are equally important to the composition of policy mixes that aim to conserve forests in socially acceptable ways (Robinson *et al.* 2018).

9.2 What works, at what cost, and why?

9.2.1 Enabling policies

Public, and often private, forests in many developing countries are *de facto* open access resources, where illegal deforestation and forest degradation activities (e.g., logging) are commonplace. Enabling policies that clarify or secure the property rights of local forest stakeholders can create the necessary capacity and incentives to fend off invaders and facilitate law enforcement, but they can also increase agricultural investments and deforestation (Liscow 2013). Such policies often come as a combination of decentralisation or devolution of natural resource management rights, forest concessions and land tenure reforms. Relatively few studies have evaluated enabling policy instruments, and results are mixed.

Decentralisation is often expected to yield positive conservation outcomes (Pagdee *et al.* 2006; Bowler *et al.* 2012). Theory suggests decentralisation reforms can improve governance efficiency, equity and responsiveness to local demands, because local authorities, who are better informed about local contexts and communities, can develop better policy solutions (Wright *et al.* 2016). Greater local efficiency and equity are also theorised to result in more effective local investments, management and, ultimately, sustainable development pathways (Ribot *et al.* 2006). However, in the presence of poverty or strong economic incentives for natural resource extraction, decentralisation could also promote deforestation (Miteva *et al.* 2012).

The few quasi-experimental evaluations of decentralisation impacts tend to report that rates of forest loss have reduced (Samii *et al.* 2014), such as in the case of India (Somanathan *et al.* 2009; Baland *et al.* 2010) and in Nepal (Edmonds 2002), but not so in Uganda (Jagger *et al.* 2018), whereas results seem mixed in Bolivia (Andersson and Gibson 2007; Wright *et al.* 2016).

Logging concessions can mitigate forest loss and degradation when concessionaires are obliged to maintain permanent natural forest cover and harvest selectively and sustainably (Clark *et al.* 2009; Vidal *et al.* 2016). Quasi-experimental studies reported logging concessions to have reduced deforestation in Indonesia (Gaveau *et al.* 2013) and Guatemala (Blackman 2015; Fortmann *et al.* 2017), whereas impacts were indiscernible in Mexico (Blackman and Villalobos 2018) and in the Republic of the Congo (Brandt *et al.* 2014; Karsenty *et al.* 2017).

Finally, direct property right transfers to individual land users and communities may enable both more sustainable land management and effective environmental monitoring, but success depends on a host of factors (Platteau 2000; Robinson *et al.* 2018). For example, titling communities, rather than individual households, could result in the unsustainable use of local common-pool resources and increase deforestation and forest degradation (Ostrom 2009). Likewise, titling can grant credit access and promote agricultural intensification to the detriment of forests (Liscow 2013). Consequently, evidence remains limited and mixed. Land titling initiatives have reportedly reduced deforestation in Peru (Blackman *et al.* 2017), increased forest loss in Nicaragua (Liscow 2013), and not affected forest cover in Brazil and Ecuador (Buntaine *et al.* 2015; BenYishay *et al.* 2017). Potential economic benefits notwithstanding, land titling seems to require complementary policy measures to effectively mitigate forest loss and inequality (Coleman and Liebertz 2014; Buntaine *et al.* 2015; BenYishay *et al.* 2017).

9.2.2 Incentive-based policies

Incentive-based policies like PES programmes that compensate landowners in exchange for maintaining or enhancing carbon stocks (and other ecosystem services) continue to be an important part of the REDD+ on-the-ground implementation portfolio (Alix-Garcia and Wolff 2014). Empirical evidence from these cases demonstrates that PES are politically feasible, popular among recipients, and can generate meaningful avoided deforestation while supporting household and community livelihoods (Ezzine-De-Blas *et al.* 2016; Börner *et al.* 2017; Salzman *et al.* 2018; Wunder *et al.* 2018). However, emerging evidence also suggests the need to temper expectations that incentive-based REDD+ policies will deliver carbon emissions reduction and sequestration more cost-effectively than direct investments in clean energy and energy-efficiency, or that they can achieve substantial poverty reduction (Kerr 2013; Lubowski and Rose 2013; Alix-Garcia *et al.* 2015; Börner *et al.* 2016, 2017; Sims and Alix-Garcia 2017).

PES schemes will reduce emissions only if they are designed to attract participation from landowners who would otherwise have caused substantial deforestation and forest degradation (Alix-Garcia *et al.* 2008; Ferraro 2008; Jack *et al.* 2008). Programmes in Costa Rica, Mexico, Ecuador, and Brazil have achieved substantial relative reductions in deforestation among participants (near 50% in some cases), but absolute avoided deforestation impacts have been small to modest when the initial rates of forest loss were low (e.g., 1–2% per year) (Robalino and Pfaff 2013; Alix-Garcia *et al.* 2015; Jones and Lewis 2015; Robalino *et al.* 2015; Sims and Alix-Garcia 2017; Simonet *et al.* 2018b).

As expected, PES have generated greater impacts in locations with high risk of deforestation and/or better capacity for implementation (Arriagada *et al.* 2012; Alix-Garcia *et al.* 2015; Costedoat *et al.* 2015); the largest absolute changes in deforestation are for a pilot PES programme in Uganda in an area with historically very high rates of forest loss (Jayachandran *et al.* 2017). While few studies have assessed *ex-post* net benefits or cost-effectiveness, Jayachandran *et al.* (2017) demonstrated positive net benefits of carbon sequestration in the Ugandan pilot. A comparison of PES and protected areas in Mexico found similar opportunity cost profiles between incentive-based and traditional mechanisms (Sims and Alix-Garcia 2017).

PES are generally expected to deliver economic benefits for programme participants because enrolment is voluntary (Wunder 2015). Evidence suggests that PES have supported livelihoods (Liu *et al.* 2018), with slightly positive or no impacts on well-being in Costa Rica (Arriagada *et al.* 2015), Mexico (Alix-Garcia *et al.* 2015; Sims and Alix-Garcia 2017), China (Liu and Lan 2018), Uganda (Jayachandran *et al.* 2017) and Ecuador (Jones *et al.* 2016). Both theory and evidence suggest that the potential for win-win environment and poverty alleviation outcomes from PES depends on whether areas at high risk of environmental loss are owned by poor households and whether payment amounts are sufficiently large to compensate for opportunity and participation costs (Pagiola *et al.* 2005; Alix-Garcia *et al.* 2008, 2015; Jack *et al.* 2008; Jindal *et al.* 2013; Börner *et al.* 2016).

To some extent, many existing PES programmes have sought to target enrolment of land at high risk of loss, of high environmental service density, or of relatively low opportunity cost. This can be achieved by, for example, locally adjusting payment levels according to deforestation risk and conservation opportunity costs, establishing areas of programme eligibility that overlap with high-risk areas, prioritising applicants with a high predicted risk of forest loss, or using auction mechanisms to solicit low-cost bids. Evidence from evaluations of national PES programmes highlights the importance of these strategies (Ferraro 2008; Arriagada *et al.* 2012; Sims *et al.* 2014; Alix-Garcia *et al.* 2015). However, comparison of PES design and implementation across the world reveals that these more sophisticated strategies are still being under-employed; in particular, the enforcement of conditionality (i.e., compliance monitoring and sanctions) is lagging severely behind (Wunder *et al.* 2018). Careful design of PES programmes will also be important for their cost-effectiveness relative to other forms of emissions reduction.

9.2.3 Disincentive-based policies

Disincentive-based approaches, like the establishment of protected areas and other land-use restrictions, remain the dominant conservation strategy in developing countries (Ferraro *et al.* 2011). The impacts of protected areas on forest cover may have both beneficial and detrimental effects on local livelihoods (Oldekop *et al.* 2016). Examples of the former are the regulation and provision of hydrological or pollination services, and the creation of jobs (mostly related to tourism), which is expected to reduce poverty. In contrast, the creation of protected areas could decrease production/extraction activities, increase human-wildlife conflicts, and limit infrastructure development (e.g., access to electricity), thereby increasing poverty (Ferraro and Hanauer 2014). While multiple studies have examined the effectiveness of these interventions in reducing deforestation and forest degradation, most relied on case studies, qualitative data or correlations, and lacked the adoption of rigorous impact evaluation techniques (Geldmann *et al.* 2013; Puri *et al.* 2016).

Most rigorous assessments have suggested that protected areas are effective at reducing deforestation and potentially alleviating, or at least not exacerbating, poverty in some areas (Canavire-Bacarreza and Hanauer 2013; Ferraro *et al.* 2013, 2015; Miteva *et al.* 2015; Busch and Ferretti-Gallon 2017; Sims and Alix-Garcia 2017); some have also demonstrated positive spillovers in neighbouring areas (Andam *et al.* 2010; Honey-Rosés *et al.* 2011), whereas others report deforestation leakage (Pfaff and Robalino 2017). The effects of protected areas also depend on their type. One global comparative assessment found multi-use protected areas and indigenous lands to be even more effective at reducing fire than strictly protected areas (i.e., without human residents) in Latin America and Asia (Nelson and Chomitz 2011). Mixed-use protected areas also stemmed more deforestation in Guatemala than strict ones, mostly due to the presence of forest concessions (Blackman 2015). Some studies, for example in Bolivia, Brazil, Costa Rica, Indonesia and Thailand, found strict protection to result in more avoided deforestation than sustainable-use areas, but in many cases the differences were not large and arose from site selection rather than management regime (Ferraro *et al.* 2013; Nolte *et al.* 2013).

Other disincentive-based policies, such as enhanced environmental monitoring, field-based law enforcement and credit access restrictions, are also often reportedly associated with declines in deforestation, particularly in the Brazilian Amazon (Hargrave and Kis-Katos 2013; Börner *et al.* 2015; Cisneros *et al.* 2015; Fearnside 2017). Still, both the environmental and economic impacts of these policies seem to be actor-specific and vary over space and time (Cisneros *et al.* 2015; Pfaff *et al.* 2015).

9.3 Summary and outlook

Our non-systematic review of the recent literature paints a heterogeneous picture in terms of how national policies can work towards effective, efficient and equitable REDD+ (Table 9.1). The low number of studies reporting no significant effects may reflect a publication bias towards significant findings, even if no such bias was found in the literature on drivers of deforestation (Busch and Ferretti-Gallon 2017). Clearly, most of the recently published rigorous evaluations of national and subnational forest conservation policies focus on deforestation (rather than forest degradation) and on countries in Latin America and Asia. As noted by others, Africa remains as an understudied region (Busch and Ferretti-Gallon 2017). Based on the available evidence, however, none of the policy instruments consistently outperforms any other across varying design and implementation contexts (Figure 9.1). On average, national policies help to reduce forest loss, but they are much less effective than their underlying theories of change would predict (Chapter 2). That said, the few available assessments of programme implementation costs suggested that the investments did pay off.

Table 9.1 Impact of national policies on deforestation (selected studies)

Study	Policy	Location	Methods	Findings
Miteva *et al.* (2015)	Protected areas (PAs)	Indonesia	Matching and difference-in-differences regression analysis	PAs reduced deforestation by 6% during 2000–2010
Ferraro *et al.* (2013)	PAs	Bolivia, Thailand, Indonesia and Costa Rica	Matching and regression analysis	Forest loss was reduced by 2.3–16.7% in strict PAs, and by 0.3–3.6% in less-strict PAs
Sims and Alix-Garcia (2017)	PAs and payment for environmental services (PES)	Mexico	Matching and regression analysis	PES and PAs reduced deforestation by 25.2% and 23.6%, respectively during 2000–2010. PES reduced poverty (11.2%) while PAs had neutral impacts on livelihoods during 2000–2012
Robalino *et al.* (2015)	PAs and PES	Costa Rica	Matching and regression analysis	0.9–1.2% and 1.2–1.6% forest loss reductions in PAs with no PES and in PES-enrolled areas away from PAs, respectively. No significant reductions in PAs enrolled in PES. 1.5% and 2.8% forest loss reductions in PA buffers and in PES-enrolled areas in PA buffers during 2000–2005
Blackman *et al.* (2017)	Land tenure	Peru	Autoregressive fixed-effects regression analysis	Land titling reduced short-term deforestation by >75% and forest disturbance by roughly 60%

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Table 9.1 Continued

Study	Policy	Location	Methods	Findings
Liscow (2013)	Land tenure	Nicaragua	Regression analysis based on instrumental variables	Titling decreased forest cover by 13.7%
BenYishay *et al.* (2017)	Land tenure	Brazil	Matching and difference-in-differences regression analysis	No mitigatory effect on deforestation during 1995–2010 due to low expected rates of deforestation on indigenous lands
Gaveau *et al.* (2013)	Timber concessions	Indonesia	Matching and regression analysis	During 2000–2010, deforestation was on average 17.6% lower in natural forest timber concessions than in oil palm; timber concessions and PAs presented a similar effect on forest conservation
Jayachandran *et al.* (2017)	PES	Uganda	Matching and regression analysis from a randomised controlled trial	5.1% reduction in deforestation after two years of PES (2011–2013)
Bauch *et al.* (2014)	Community-based enterprises	Brazil	Matching and difference-in-differences regression analysis	Almost no discernible impacts on household income, assets, livelihood portfolios, or forest conservation during 1997–2006
Arriagada *et al.* (2012)	PES	Costa Rica	Matching and difference-in-differences regression analysis	PES increased forest cover by 11–17% in enrolled lots during 1992–2005
Costedoat *et al.* (2015)	PES	Mexico	Matching and difference-in-differences regression analysis	12–14.7% more forest cover in lots enrolled in the PES programme during 2007–2013

More evidence based on counterfactuals – in particular from randomised controlled trials or quasi-experimental designs, may eventually enable meta-analyses to identify cost-effective national policy instruments for variable contexts and outcome measures (Macura *et al*. 2015; Baylis *et al*. 2016; Puri *et al*. 2016). Equally, an increasing number of studies demonstrate that technical and institutionally feasible adjustments to the design and implementation strategies of existing national forest conservation policies (e.g., spatial targeting, improved monitoring and enforcement) could massively boost cost-effectiveness (Börner *et al*. 2016; Ezzine-De-Blas *et al*. 2016; Wunder *et al*. 2018).

However, knowledge about what works best, where and when, may not be enough. What prevents policy-makers from adopting these science-based recommendations? We know too little about what determines policy-makers' choice and design of

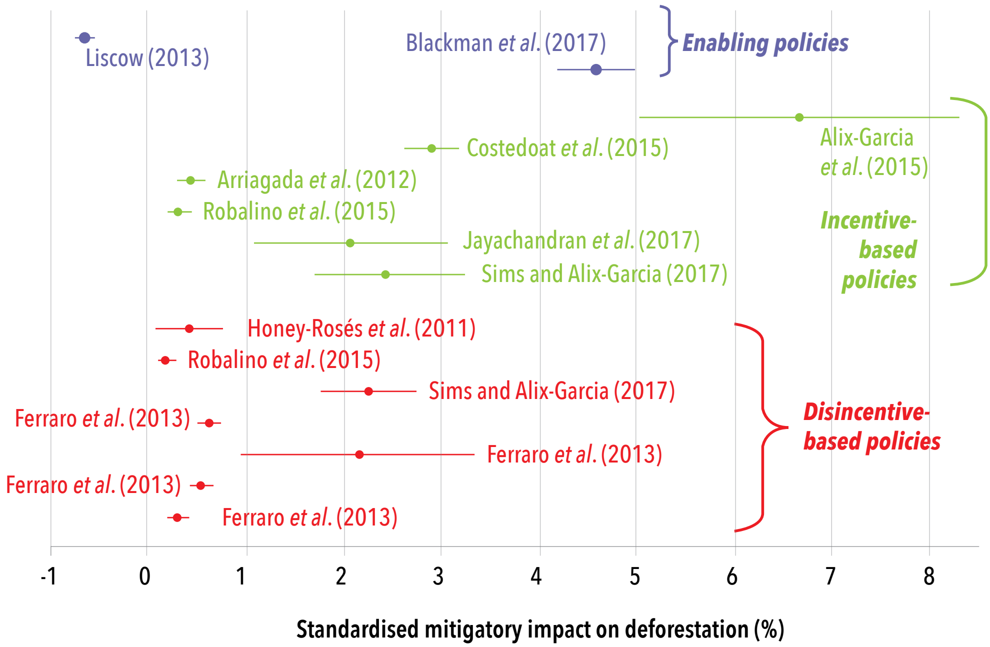

Figure 9.1 Effect sizes of national policies

Note: Standardised impacts calculated based on the method described in Samii *et al.* (2014). Dots represent average annualised impacts. Lines represent standard errors.

national forest conservation policy instruments. Administrative and institutional constraints, as well as limited bargaining power and multiple side objectives of environmental ministries in developing and emerging economies, can lead to suboptimal policy choices and design outcomes, even if decision-makers are well-informed (Rosa da Conceição *et al.* 2015; Nolte *et al.* 2017). Likewise, policy design, implementation (including enforcement) and context conditions change over time (Lambin *et al.* 2014). As a result, success stories are not guaranteed to last (see Box 9.1) as temporary shifts in public policy priorities can produce easily revertible improvements in forest governance structures. REDD+ will thus have to provide sizeable, stable and long-term incentives to recipient country governments if it is to achieve lasting conservation outcomes.

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