

Deforestation, governance and economics: a survey of perceptions of causes and policies

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Paper presented at the International Society of Ecological Economics,
Rio de Janeiro, Brazil, 16–19 June, 2012

1 Introduction

There is a large literature on the proximate and underlying causes and agents of deforestation and possible policies to address them (described in more detail below). However, much of this literature takes either an economics or a governance perspective (Tacconi 2011). Addressing these aspects in a comprehensive way is critical to designing effective policies to reduce deforestation. Policies that only deal with one aspect of the problem (i.e. immediate versus underlying causes, economics versus governance) are less likely to succeed in reducing deforestation.

In furthering our understanding of the causes of deforestation and potential policies, two aspects need to be considered. First, the literature on the causes of deforestation is mostly based on deductive (often cross-country) theoretical models which, in some cases, are tested with empirical data, or on inductive research which analyses deforestation at the sub-national level with a combination of methods including geographical information systems, interviews and historical research. The policy prescriptions derived from the deductive approach are normally proposed as being generalisable across all countries; their implicit assumption is that there is only one causal pathway to linking the identified variables to deforestation. Inductive studies are more circumspect about possible generalisations; local empirical models are more likely to suffer from the assumption that deforestation can only be explained by locally specific causes. By not comparing across cases, they might miss some key factors (i.e. variables). Research methodologists point out that equifinality – that is, multiple causal pathways (different variables or different combinations of variables) – needs to be considered in explaining an outcome.

Second, the degree to which policy recommendations have been implemented and subsequent assessments of their eventual effectiveness has received limited attention. Analysis of these issues can shed light on whether the causes of deforestation identified in the literature appear to be supported by local realities and whether the remedies are

being implemented and appear to be effective.

The purpose of this research was to address these gaps, by investigating how the perceptions of local experts relate to the scientific knowledge about the causes of deforestation and their understanding of the interrelationships between economic and governance factors affecting deforestation. The research also sought to improve the understanding of the effectiveness policies aimed to address deforestation, which ones are viewed as having the potential to work if implemented, and whether there are any other policies (and what they are) that could be more effective in reducing deforestation.

The research considered the broad spectrum of economic causes of deforestation and related policies identified in the literature, while decentralisation, corruption and illegal logging were the focus of the assessment of policies to address governance issues.

2 Causes of deforestation and policy prescriptions

There is an extensive literature relating to forest transition, which arose from the observations that many countries saw reductions in forest areas in the early stages of economic development, after which it stabilised, and in many cases started to increase (Mather 1992, Mather and Needle 1998). The theory is still being developed (Barbier et al. 2010, Lambin and Meyfroidt 2010).

It can be seen from the brief overview presented below that the causes (and agents¹) of deforestation are relatively well identified – even if the direction of change is, at times, uncertain in different contexts. Interactions between drivers can also compound the effect (Madeira 2008).

2.1.1 Proximate causes

The proximate factors affecting deforestation rates are factors directly affecting the returns to land use, including specific forest management policies, and more general macroeconomic factors. From an economic perspective, deforestation will occur when the returns from land uses are higher than those of standing forest (Angelsen 2010, Barbier et al. 2010). The most direct factors are commodity prices – high agricultural commodity

¹ The literature indicates that the primary agents of deforestation have shifted over time from state-funded enterprises and large-scale settlement investments to more decentralised decision-making by farmers, land speculators, agri-business and ranchers (Rudel 2007, Barbier et al. 2010).

and timber prices will increase deforestation rates.² Returns can also be affected by local population growth and the local demand for forest products (including charcoal and fuelwood). Other variables affecting the profitability of alternative land uses also affect deforestation rates. Low agricultural wages can also increase deforestation rates (Angelsen 2010), while high off-farm employment opportunities can have the reverse effect. Overall, the evidence on the profitability of sustainable forest management indicates that it cannot compete with agricultural land uses (Pearce et al. 2003). Inadequate regulations for allocating, managing and enforcing forest lease conditions can also contribute to deforestation or forest degradation (Barbier et al. 2010). Infrastructure development can increase market access and reduce transport costs, potentially improving the profitability of forestry operations and agriculture. However, the direction of causality can vary – in some cases roads are built to service existing areas of cleared forest with settlements (Kaimowitz and Angelsen 1998, Angelsen 2010).

2.1.2 Underlying causes

These direct factors are driven by a host of underlying factors, including government policies that affect forest management decisions, demographic changes, macro-economic conditions and the quality of governance.

Perverse incentives, typically affecting agriculture (e.g. input subsidies or commodity price controls) can (falsely) improve the viability of agriculture encouraging agricultural expansion and increasing deforestation. High input prices have uncertain effects – they can make agriculture less profitable (reducing the pressure on forested land conversion), or they can lead to substitution of fertiliser by land (for example) increasing deforestation (Kaimowitz and Angelsen 1998, Angelsen and Kaimowitz 2001).

Population growth and increasing incomes can both increase rates of deforestation (Kaimowitz and Angelsen 1998, Barbier and Burgess 2001, Williams 2003, Scrieciu 2007) to meet increasing agricultural demands, because of their effects on labour markets and including local demand increases (e.g. meet local fuel demands) (Pfaff et al. 2010).³ However, population growth and density can have different effects in different locations (Koop and Tole 1999, Bhattarai and Hammig 2001), and are said to be mediated locally by the degree of globalisation (Kull et al. 2007). In the case of income, the theory of the

² However, lower prices do not automatically result in lower deforestation rates, as they can reduce incentives for efficient harvesting and/or processing (Kaimowitz & Angelsen 1998).

³ Changes in energy sources can also reduce deforestation rates at a certain level of development (Rudel et al. 2005, Lambin and Meyfroidt 2010).

environmental Kuznets curve suggests that once a certain minimum level of income is reached, deforestation is halted or reversed) (Contreras-Hermosilla 2000), though the evidence for this phenomena is not without question (Shafik 1994, Koop and Tole 1999, Nguyen Van and Azomahou 2007).

Technological change can also affect deforestation rates. Technologies that facilitate the expansion of agriculture in forested land are expected to lead to deforestation (Kaimowitz and Angelsen 1998, Angelsen and Kaimowitz 2001, Barbier et al. 2010).

However, this is not the anticipated outcome where labour is in short supply and labour-saving technologies are introduced, or with technologies that increase the productivity of lands already cultivated (Kaimowitz and Angelsen 1998, Angelsen and Kaimowitz 2001).

Market failures – primarily the failure to account for lost or degraded ecosystem services, or to protect services – increases deforestation. If markets recognised these values, it is possible that the returns from protection could potentially be sufficient (Barbier et al. 2010). Under certain conditions, insecure and secure property rights over forests can also increase deforestation.

Government policies affect the returns from land uses directly (e.g. taxation policies, subsidies for agricultural inputs, forest concession allocation processes), or indirectly (e.g. through the effects of external government debt (Pfaff et al. 2010) or exchange rate policies). The empirical evidence with regard to the latter is not always clear cut (Kaimowitz and Angelsen 1998, Contreras-Hermosilla 2000, Bhattarai and Hammig 2001, Arcand et al. 2008).⁴ Secure rights can increase the net present value of land clearing (Angelsen 2010) depending on the right-holders preferences for conservation, while insecure rights can increase the profitability of extractive activities and stimulate conversion to agriculture (Barbier et al. 2010).

Thus far, attention has been given to the role of government policies, but not explicitly to the quality of governance. Democracy has been shown to result in lower deforestation because authoritarian governments make investment decisions to conserve a forest more risky and insecure, leading to greater deforestation (Deacon 1994, Didia 1997, Mather and Needle 1999, Bhattarai and Hammig 2001). Political stability also has a role to play, particularly in Latin America (Barbier and Burgess 2001). These results do not suggest

⁴ There is no strong theoretical reason to expect that debt would influence deforestation because there are other government expenditures that could have a similar effect to interest repayments (Scricciu 2007).

deforestation does not to occur in democracies, as they are also subject to local pressures and can be reluctant to enforce forest protection (Shafik 1994).

Both illegal logging and corruption may delay the onset of reduced deforestation rates and/or contribute to increased deforestation (once again, depending on the context), though very little is actually known about their effects on (or contribution to) deforestation.

Illegal logging is thought to be partially driven by the financial benefits it provides, the lack of government interest and/or capacity to enforce the law, and in some cases community perceptions that it is not a criminal or harmful activity (Tacconi 2007b). Additional causes include a lack of coordination between licensing of timber harvesting and milling, and by logging and export bans creating overcapacity in the processing sector and subsequent pressure to increase logging to ensure the viability of mills (Palmer 2001). Illegal logging has also been associated with political cycles – increasing dramatically in the year before elections – in some countries (Burgess et al. 2011).

Despite the knowledge of the causes of illegal logging, the extent of land areas affected by illegal logging and illegal agricultural development is unknown, and it is argued that in at least some cases, rates of illegal logging are overestimated (see for example Cerutti and Tacconi 2008). However, illegal logging is exacerbated by corruption, which allows it to occur in the first place, and letting it go unchecked and unpunished (Smith et al. 2003a).

Reports of corruption⁵ in the forest sector have increased in recent years (Contreras-Hermosilla 2000, Le Billon 2000, Smith et al. 2003a). While some studies have found a statistically significant link between corruption on deforestation (Barbier and Burgess 2001, Barbier et al. 2005), another study indicates that while corruption was correlated with changes in total forest cover, it was not associated with changes in natural forest cover (Smith et al. 2003b).

The effects of corruption are partially dependent on the type of corruption – whether on a petty or grand scale, and whether against or with the law. The latter refers to payments made to officials to allow legal activities to be undertaken (Smith et al. 2003a, Tacconi et

⁵ Corruption is typically viewed as the misuse of public office for private gain (Tacconi et al. 2009). It is recognised that this definition ignores private sector and NGO corruption.

al. 2009) and does not imply that payments would change the behaviour of the corrupt official (compared to what would occur in the absence of corruption) (Rose-Ackerman 1975).

Rent seeking is the root cause of corruption (Angelsen 2010), which is facilitated where resources are valuable, and in situations of ill-defined property rights and poor use regulations (Barbier et al. 2010).

Additional factors identified as contributing to corruption (though in literature not necessarily dealing explicitly with the forest sector) include poor and/or conflicting legislation, complex bureaucratic processes, low penalties (Fjeldstad 2004), weak monitoring and enforcement, institutional incentives (including low wages, high levels of discretion, patronage and complexity), as well as a lack of transparency and government accountability, and a low capacity to develop and/or enforce good legislation.⁶

Two additional factors contributing to the level of corruption are said to be the level of competition between different levels of government and the degree of centralisation (Fjeldstad 2004). Thus, decentralisation⁷ is also relevant in many countries to the consideration of deforestation, particularly as it has occurred (at least partially) across much of the developing world. Studies of decentralisation suggest that the local management of resources (including forests) should result in improved sustainability (Larson 2003), efficiency and equity (Pfaff et al. 2010) compared to centralised management, and also has the potential to reduce corruption and limit the use of forest resources as a means to maintain political power (patronage).

In practice however, the outcomes of decentralisation are dependent on the conditions in which they are implemented, and where returns to deforestation from alternative land uses are higher than from retaining forest, democratic decentralisation may result in deforestation (Ribot 2004, Tacconi 2007a). Local government will affect deforestation through their choices about the provision of local infrastructure or policies to stimulate

⁶ There are also a number of more systemic causes, including the system of political funding, a lack of funding for the defence forces/security forces, a corrupt or weak judiciary, unclear allocation of competencies and a lack of recognition of, or respect for indigenous rights.

⁷ Decentralisation is any activity by which government formally cedes powers to lower levels of government in a political-administrative territorial hierarchy. This excludes devolution to non-government institutions (devolution), but can include deconcentration (where administrative but not fiscal powers are decentralised).

local economic growth. Decentralisation can fragment the management of resources that would be better managed at the landscape level (Capistrano and Colfer 2005), and forest management subsequently requires the capacity of a larger number of institutions than would be the case with centralised management. The process of decentralisation may generate uncertainty over the control of resources, which has the potential to increase the rates of deforestation (see the discussion of insecure property rights above) (Tacconi 2007a).

There is a considerable literature on the links between decentralisation and corruption, though little of it relates specifically to forestry. Generally, there are two possible outcomes: (i) decentralisation may increase government accountability and discipline; or (ii) it may reduce coordination and exacerbate the incentives for officials at different levels (Fan et al. 2009). The former would occur by spreading power more evenly, reducing the cost of bribes, as no actor can monopolise control (Smith and Walpole 2005). In the latter case, increased competition between levels of government can result in 'overgrazing' of bribes, and make it simpler to hide corrupt practices (Fjeldstad 2004). Whether an increased number of tiers of government results in higher corruption (i.e. larger and more frequent bribes) is uncertain (Fan et al. 2009), though it has been suggested that it does result in increased deforestation (Burgess et al. 2011).

3 Methods

The purpose of this research was to integrate consideration of economics and governance factors, and to examine the perceptions of forest managers and policy-makers of the multiple causes of deforestation. Emphasis was placed on the interconnections of those economic and governance variables affecting deforestation and the effectiveness (or otherwise) of policies designed to directly or indirectly reduce deforestation. The perceptions of forest managers and policy-makers were sought using an internet-based survey.

3.1.1 Survey tool

The survey instrument was a self-completed internet-based survey, and was developed by the authors, reviewed by a number of forest management experts, and revised on the basis of these comments, all during 2011.

The use of a web-based survey tool and an email based invitation was chosen because it was thought to be the most effective means of reaching the largest possible sample of potential respondents. There are several advantages associated with the use of internet-

based surveys are the relative ease of correctly completing the form for participants, whilst allowing complex branching of questions (i.e. skip patterns) and flexibility in the type of questions used (e.g. check all that apply). In addition to their relatively low cost, they also remove interviewer bias, and increase convenience for respondents who can take as long as they wish to respond (Van Selm and Jankowski 2006). In terms of analysis, direct processing of the electronic data reduces errors compared to conventional methods (e.g. from data-capture, editing, coding, etc.) (Stapleton 2010).

The difficulty of establishing a sampling frame, combined with financial and time constraints, meant that a mixed-mode data collection process was not possible. Hung and Law (2011) outline the comparisons between online survey methods and more traditional designs (including telephone, mail and face-to-face surveys). They note that the results of these comparisons have been mixed – some scholars report differences (e.g. in response rates, costs, completion time and study results), while others report no differences (e.g. in generalisability and reliability).

3.1.2 Anonymity

Additionally, the internet provides methods for ensuring confidentiality far beyond those of conventional data collection methods (Lavrakas 2008). Because the survey instrument asked minimally sensitive information about respondents' perceptions of illegal activities (illegal logging and corruption), it was thought that enabling the provision of easily anonymised responses would protect the privacy of respondents and improve their cooperation.

This strategy has a weakness in no authentication was required to access the survey; it is possible that a single individual responded more than once. In order to avoid this problem, and to reduce multiple submissions from single respondents due to technical error/difficulties, questionnaires returned within five minutes of each other were subjected to a manual check (for identical responses) in cases where the responses had been submitted, but respondents not informed correctly due to slow or interrupted connection (see Van Selm and Jankowski 2006).

3.1.3 Sampling, contact and response

As it was not possible to generate a sampling frame⁸, a non-probability sampling method

⁸ It should be noted that the population characteristics of forest management and governance experts are not known, and there is no way of constructing the sampling frame in order to conduct random sampling that could provide greater validity.

was used to target potential respondents. Respondents were recruited on the basis of their membership of plausible interest groups, using emails sent to a number of global email lists inviting them to participate in the survey, and allowing them to respond anonymously. These lists targeted individuals working in forest management and governance around the world – including those working specifically on forest management policy design and implementation – at the local, sub-national, national and international level anywhere in the world.

3.1.4 Problems with the approach

The validity of this survey tool beyond the sample respondents is not certain given the non-probability nature of the sampling effort – the respondents may differ in some way from the population of forest managers and policy makers, especially with regard to motivational or attitudinal characteristics. While this may be related to the small sample size, there is no suggestion that a larger sample would result in a better representation. The results cannot therefore be assumed to represent those beyond the sample that responded, and there is no implication of generalisability from the presentation of these results. It should be noted that generalisability in this context refers to the national context of each respondents focus country. Problems in generalising to all countries have been noted in the Introduction and apply to probability sampling methods as well.

Further, the use of non-probability samples generally does not support statistical inference (thus bias), and usually there is no way to assess non-response bias, because there is usually no information on those who do not opt-in to such surveys.

This strategy was used despite the potential for bias in responses, due to uneven internet penetration amongst the target respondents (Van Selm and Jankowski 2006, Lavrakas 2008). It is likely that local forest management experts have been under-sampled by this method, as living in often remote localities with often poor services, they may not utilise email mailing lists to receive information (and therefore would not have received the invitation to participate) and/or would have had insufficient access to the web to complete the survey. Another potential source of bias is target respondents who are not sufficiently computer literate to be able to respond.

Low response rates can be because potential respondents view invitations as unwanted and/or as spam (Manfreda et al. 2008, Hung and Law 2011). With a method such as this, it is impossible to calculate a response rate (given the dynamic membership of the lists used to target participants (see also, Munoz-Leiva et al. 2010), though with a low number

of respondents, it can be assumed that the response rate is also low. However, the contact rate (Lavrakas 2008) was 73%.

4 Results

Respondents worked for research/academic organisations and non government organisations (31% each), government (14%) and other organisations (24%). Forestry (48%) and biodiversity conservation (27%) were the two sectors that respondents work was most closely related to, and they were primarily researchers (36%) and project/programme implementers (28%).

Most respondents worked at the national level (36%), though with large minorities working at the community/village level (24%) and the provision/regional or sub-national level (21%).

Respondents were asked which (single) country they worked in most frequently: India (14%), Cameroon, Indonesia and Peru (11% each), though other respondents worked in Argentina, Bolivia, Brazil, Cambodia, China, Republic of the Congo, Ecuador, Gabon, Kenya, Liberia, Mexico, Norway, Serbia and Thailand.

Respondents were asked about the level of influence they wielded over the development and implementation of forest, land use and environmental policy at the local, national and international level. The majority of respondents felt that they had weak or no influence over these issues, particularly for international forest policy. However, there was a small minority which felt that they had moderate or strong influence over local forest policy development (54%) and implementation (48%) or over national forest policy (45%) and implementation (40%).

4.1 Causes of deforestation

Respondents' believed high commodity prices and growing demand as well as poor regulations and enforcement were the proximate causes of most importance causing deforestation and forest degradation (Table 1). These results indicate factors related to governance quality as more important than those relating to economic causes.

Table 1 Proximate causes of deforestation and forest degradation (%)

	Of primary importance	Important	Of marginal importance	Not at all important	Don't know	n
a) High agricultural returns/commodity prices (encouraging agricultural expansion)	32	50	11	5	3	38

b) High timber prices (increasing legal logging)	32	32	24	8	3	37
c) High timber prices (increasing illegal logging)	41	38	14	5	3	37
d) Low timber prices (encouraging inefficient harvesting and processing)	11	27	32	22	8	37
e) Low agricultural labour costs (encouraging agricultural expansion)	13	18	42	18	8	38
f) Low land prices (encouraging agricultural expansion)	18	26	34	16	5	38
g) Local population growth (increasing demand for agricultural land)	33	33	26	5	3	39
h) High/growing demand for forest products (increasing logging)	32	42	24	3	0	38
i) High/growing demand for agricultural commodities (encouraging agricultural expansion)	50	28	20	0	3	40
j) Harvesting for fuelwood/charcoal	21	37	26	16	0	38
k) Infrastructure development, especially roads (increasing access and/or services and lowering transport costs)	50	30	15	5	0	40
l) Technological change in agriculture (encouraging agricultural expansion)	21	33	33	8	5	39
m) Poor land and forest management regulations	54	31	5	8	3	39
n) Poor enforcement of land and forest management regulations	75	18	0	5	3	40

Indicates the highest frequency response

The proximate causes identified accord with the most important underlying causes (Table 2): population and income growth increasing demand for commodities (agricultural and timber), and corruption. As was the case with proximate causes, factors relating to governance were viewed as more important than economic and other factors. Corruption was identified as of primary importance by a majority of respondents. Corruption is likely linked to the poor regulations and enforcement identified as a proximate causes. Insecure property rights were also identified as an important underlying cause, removing incentives property managers may have for sustainable forest management. The inadequate recognition of the value of ecosystem services and the lack of mechanisms to realise these values were also of critical importance.

Table 2 Underlying causes of deforestation (%)

	Of primary importance	Important	Of marginal importance	Not at all important	Don't know	n
a) Human population growth (increasing demand for agricultural land, food and timber products, changes in labour markets)	36	33	23	5	3	39
b) Income growth (increasing national and/or international demand for food and timber products)	29	45	26	0	0	38
c) Exchange rate policies (through their influence on export prices, with a low exchange rate increasing demand for agricultural land)	8	41	32	5	14	37
d) Public/foreign debt (through its impact on revenue generation requirements to meet debt servicing obligations or reduce ability to afford effective enforcement)	8	16	46	16	14	37
e) Lack of democracy	24	35	22	16	3	37
f) Insecure property rights over forested land (meaning few incentives for sustainable forest management exist)	46	28	23	3	0	39
g) Inadequate (or no) recognition of the value of ecosystem services provided by forest lands, and no mechanism to capture these values	39	47	11	3	0	38
h) Poverty traps, including conflict and war	16	22	41	16	5	37
i) Non-forestry sector taxes and subsidies creating perverse incentives for agricultural expansion(e.g. input price subsidies, price floors for commodities, etc.)	23	21	38	13	5	39
j) Forestry sector taxes and subsidies creating perverse incentives increasing deforestation(e.g. tariffs on imports, log export bans, subsidised processing)	11	37	26	13	13	38
k) Corruption	70	22	5	3	0	37
l) Deforestation used as a means to assert property rights	14	32	38	14	3	37

Indicates the highest frequency response

4.2 Decentralisation

Decentralisation had occurred in 78% of countries covered by this survey, though only 63% had also experienced forest management decentralisation. It would appear that decentralisation has only taken place with respect to forest and land use policy implementation, not to policy design (Table 3).

Table 3 Responsibility for forest policy design and implementation (%)

	Local government	Provincial/ state government	National government	n
Who (now) has primary responsibility for the				
a) design of forest policy in this country	0	12	88	25
b) implementation of forest policy in this country	24	48	28	25
c) design of land use policy in this country	4	20	76	25
d) implementation of land use policy in this country	24	48	28	25
e) design of other environmental policy in this country	4	8	88	25
f) implementation of other environmental policy in this country	24	36	40	25

Indicates the highest frequency response

Only 25% of respondents believed that, since (forest management) decentralisation reforms, that deforestation had increased. 38% of respondents thought that deforestation had remained the same and 38% believed it had decreased since decentralisation reforms were implemented. Only 16% of respondents believed that sub-national governments had sufficient financial resources to undertake forest management, and 8% that it was strong enough to implement forest management rules and regulations, both posing significant threats to the success of decentralisation efforts.

These relatively promising outcomes appear to have occurred despite apparently poorly designed decentralisation processes (Table 4). It seems that few of the conditions that would be likely to lead to successful outcomes were incorporated into the process.

In those countries where forest decentralisation had taken place (n=25), 80% of respondents believed that the transfer of power during forest management decentralisation had resulted in uncertainty over the control of resources. More positively, 54% of respondents believed that local communities have more input into the current setting of forest management rules and regulations than they did prior to decentralisation, though only 33% believed that forest management rules and regulations set by local government were more closely adhered to than rules set prior by (central) government.

Table 4 Policy design and implementation factors affecting the outcomes of decentralisation (%)

	Yes	No	n
a) Decentralisation policies were well designed	29	71	21
b) Decentralisation policies were fully implemented	5	95	22
c) Implementation was strategically sequenced to minimise conflict and resistance	15	85	20
d) The appropriate level of discretionary power/decision-making authority was decentralised	19	81	21
e) The decentralisation of responsibilities was accompanied by sufficient financial resources to enable newly decentralised authorities to meet new responsibilities	9	91	22
f) Decentralisation over a full range of responsibilities occurred	9	91	22
g) Decentralisation was accompanied by sufficient capacity building so local government can discharge their responsibilities effectively	15	85	20
h) Local government is downwardly accountable	24	76	21
i) A clear division of responsibilities between central and local government was created	45	55	22
j) Local government is subject to an appropriate degree of oversight	29	71	21
a) The design of the decentralisation process involved stakeholder consultation	27	73	22

Indicates the highest frequency response

Despite the apparently poor processes, 82% of respondents believed that decentralisation was supported by both central and sub-national government, though only 30% felt that this support implied that decentralisation mechanisms were secure (i.e. there was no fear of having responsibilities being recentralised).

64% of respondents (n=22) believed that corruption in forest management had remained at the same level since decentralisation began; 32% believed it had increased, and just 5% believed it had decreased.

4.3 *Illegal logging*

95% of respondents believed that illegal logging occurs in the forestry sector of the country they work in (n=37), though only one third had direct experience⁹ of illegal logging. Table 5 shows respondents perceptions regarding the relative importance of different types of illegal logging.

⁹ Direct experience means to have been directly involved in, or have witnessed first hand, a corrupt transaction taking place. A corrupt transaction involves an abuse of public office for private gain. Corruption at the local level refers to the rates and extent of corruption not the 'value' of corrupt transactions.

Table 5 Relative importance of different types of illegal logging (%)

	Of primary importance	Important	Of marginal importance	Not at all important	Don't know	n
Harvesting without a(ny) legal permit	55	35	6	3	0	31
Transporting illegally harvested timber (e.g. using a single permit to transport multiple harvests)	52	32	3	0	13	31
Harvesting with an irregular permit (e.g. a permit valid for harvesting in a different location)	45	29	10	6	10	31
Failure to harvest only allowed/legally specified species	40	23	20	7	10	30
Logging occurs outside concession boundaries (and in protection/conservation zones)	39	35	16	6	3	31
Harvest is greater than the annual allowable cut/quota	26	52	6	3	13	31
Repeat harvesting before the approved cutting cycle	19	45	19	3	13	31
Logging occurs outside concession boundaries (but within production zones)	31	44	13	6	6	32
Failure to use contracted methods	13	50	10	7	20	30
Harvesting undertaken by small scale timber cutters (e.g. for housing materials) whose use is criminalised	28	34	31	6	0	32

Indicates the highest frequency response

Despite the perceived extent of illegal logging, 79% of respondents believed that the probability of detection of illegal logging is low (38%) or moderate (41%), and 86% felt the probability of being convicted for illegal logging is low (65%) or moderate (21%) (n=34 for both). A majority (59%) also believed that the penalties for illegal logging were low (n=34), so it is not surprising that 76% of respondents did not believe that these penalties act as a deterrent to illegal logging (n=34).

With respect to the links between illegal logging and corruption, a vast majority of respondents agreed that corruption contributes to illegal logging by allowing it to go unchecked (88%; n=34) and by reducing the likelihood of conviction if caught logging illegally (78%, n=32).

4.4 Corruption

In terms of perceptions of the pervasiveness of corruption, 56% (n=36) believed that corruption was systematic/pervasive, 36% that it was commonplace or routine, while only 8% felt that it was isolated. A majority of respondents believed corruption to be evenly spread across the country (i.e. between different provinces, districts or region) (90%). While most (59%) believed corruption to be the same at the local level as at the central level, 28% felt it to be more pervasive at the local than the central level.

92% of respondents believed corruption occurs in the forest sector of the country they work in, and 97% believe it occurs outside the forestry sector (n=36). However, only 32% of respondents stated they had direct experience of corruption in the forestry sector (n=31), compared to 56% with direct experience of corruption outside of the forestry sector (n=36).

Table 6 Spread of/perceptions of corruption inside and outside the forestry sector, at different levels of government (%)

	Yes	No	n
The corruption that I know about occurs at the:			
a) local government level in the forestry sector	93	7	29
b) local government level outside of the forestry sector	87	13	30
c) central government level in the forestry sector	83	17	30
d) central government level outside of the forestry sector	87	13	30
I have direct experience of corruption at the:			
a) local government level in the forestry sector	41	59	29
b) central government level in the forestry sector	24	76	29

Indicates the highest frequency response

Table 6 further demonstrates the perceptions of pervasiveness, though direct experience of corruption is considerably higher at the local than the central level. The relative importance of types of corruption are shown in Table 7. Both corruption to speed up legal activities and corruption to facilitate illegal activities were considered of primary importance. The former cannot be linked solely to deforestation, because if legally sanctioned activities can lead to deforestation, they could do so even without corruption. On the other hand, the latter may cause deforestation. The incidence of corruption of policy is not perceived as widespread as other types, though this does not necessarily imply that it is not as important – few occurrences of policy corruption could have widespread effects.

Table 7 Relative importance of types of corruption in the forestry sector (%)

	Of primary importance	Important	Of marginal importance	Not at all important	Don't know	N
Corruption involving the solicitation/payment of bribes to government officials to facilitate legal activities (e.g. grease payments to speed up bureaucratic processes)	55	34	7	0	3	29
Corruption involving the solicitation/payment of bribes by large firms to 'overlook' the occurrence of illegal activities associated with forest management (e.g. harvesting outside a concession area or in excess of concession quotas)	52	41	3	0	3	29
Corruption involving large firms illicitly influencing the awarding of forest/logging concessions	36	36	11	11	7	28
Corruption involving the solicitation/payment of bribes to government officials to avoid tax, duty and other fiscal payment requirements	33	44	15	0	7	27
Corruption involving large firms illicitly influencing the design of policies relating to land use (including enforcement policy)	24	41	14	10	10	29
Corruption involving the payment of bribes by small firms to ensure a lack of enforcement of harvesting, milling and/or transportation regulations	25	39	25	0	11	28
Corruption involving large firms illicitly influencing the design of policies relating to forest management (including enforcement policy)	24	24	24	17	10	29

Indicates the highest frequency response

Apparently confirming the perceptions of pervasive corruption, Table 8 indicates that all public sector actors play roles in corrupt activities.

Table 8 Relative importance of groups of public officials in contributing to corruption

	Of primary importance	Important	Of marginal importance	Not at all important	Don't know	n
a) Armed and/or security forces	17	41	17	21	3	29
b) Low ranking bureaucrats (local government)	36	50	11	0	4	28
c) High ranking bureaucrats (local government)	48	48	0	0	3	29
d) Local level politicians	38	48	7	0	7	29
e) Low ranking bureaucrats (central government)	21	59	14	0	7	29
f) High ranking bureaucrats (central government)	45	41	7	0	7	29
g) National level politicians	36	46	4	7	7	28

Indicates the highest frequency response

Though 55% of respondents believed that the probability of detection of corruption in forest management is moderate (n=31), 81% believed that the probability of being convicted is low (n=31), with 66% believing the penalties are low (n=29), and 80% feeling the penalties do not act as a deterrent to corruption (n=30).

4.4.1 Anti-corruption policies in the forestry sector¹⁰

Anti-corruption policies had been designed for the forestry sector in 55% of respondents' countries (n=29), though only in 59% of these cases had the policies been implemented. Where anti-corruption policies had been implemented, 60% of the time they had been implemented at the local level and at the central level.

Anti-corruption policies were typically designed in a non-sectoral manner (i.e. they had been designed both for and outside the forest sector), with 76% of countries implementing these policies outside the forest sector (n=17). 64% of respondents believed that the implementation of anti-corruption policies in the forestry sector had similar outcomes as those in the non-forestry sectors, while 36% believed that forestry sector anti-corruption policies had been less effective than those implemented in non-forestry sectors (n=14).

Table 9 Policy design and implementation factors affecting the outcomes of anti-corruption measures

	Yes	No	n
Anti-corruption policies were correctly targeted at the causes/sources of corruption in the forestry sector	57	43	14
The bureaucratic steps to operate legally in the forestry sector were simplified	14	86	14
The regulatory framework was simplified and clarified	20	80	15
Previously illegal activities were legalised	20	80	15
The (financial and/or human) resources required for effective law enforcement were increased	25	75	16
The discretionary power of officials was reduced	27	73	15
Bureaucrats were provided with well-defined career paths	33	67	15
Civil service salaries were increased	47	53	15

Indicates the highest frequency response

Just 13% of respondents believed that the implementation of anti-corruption policies in the forestry sector was sustained and credible (n=16), and only 21% thought that they had been pursued equitably (i.e. not used to target enemies, or only lower order corruption; n=14). This indicates that it is unlikely that these policies have been effective.

In relation to effectiveness, none of the policies proposed in the literature to address the direct causes of deforestation are perceived to have been implemented and effective

¹⁰ Questions about anti-corruption policies were asked separately to those relating to policies specifically designed to reduce deforestation because, where they have been implemented, they need to be implemented across the whole economy, not on a sectoral scale.

(Table 10). The policies that are seen as being partially effective are those focusing on the more established principles of sustainable forest management, land use zoning and protected area establishment.

Policies focusing on the underlying economic causes of deforestation are mostly unimplemented or, where they have been implemented are perceived to be ineffective. The exception is the using of spatially targeted policies to stimulate intensive agriculture which is considered to have been partially effective.

Table 10 Effectiveness of policies designed to reduce deforestation by dealing with its direct causes(%) (ordered by columns b and c, descending)

	Implemented and are largely effective (a)	Implemented and are partially effective (b)	Implemented and are not at all effective (c)	No, not implemented (d)	No, but could be effective if implemented (e)	n
Designing and implementing forest management rules and regulations	9	66	19	3	3	32
Reforming concession policies to recognise community land rights and enable community access to production forests	3	47	7	27	17	30
Creating and/or enforcing protected areas	19	44	25	9	3	32
Designing and implementing land use planning and ecological zoning regulations	6	41	34	6	9	32
Participation in certification efforts	13	29	29	6	13	31
Reforming concession policies to remove perverse incentives against sustainable forest management	7	27	20	27	13	30
Enforcing forest management rules and regulations (including imposing penalties for breaches)	6	38	47	3	6	32
Enforcing land use planning and ecological zoning regulations and imposing penalties for breaches	6	22	47	13	9	32
Providing direct incentives for sustainable forest management	3	22	25	13	38	32
Improving transparency in the supply chain, decreasing opportunities for illegal logging	3	19	28	19	22	32
Providing direct incentives for reforestation	6	19	38	13	25	32
Instituting import restrictions over certain species	7	17	27	20	7	30
Reforming support to the timber processing industry (including export regulations, etc.) to remove/reduce any excess capacity	3	14	17	24	28	29
Reforming forest sector policies to simplify bureaucratic procedures (i.e. to remove unnecessary red tape)	6	13	22	31	25	32
Creating markets or institutions to support payments for ecosystem service schemes	3	13	31	41	13	32
Providing and/or encouraging the use of alternative fuel sources (other than firewood and charcoal)	3	13	34	25	22	32
Participation in reciprocal trade initiatives to help enforcement and reduce illegal trade between supplying and demanding countries	3	13	33	10	23	30



 Indicates the highest frequency response

Table 11 Effectiveness of policies to reduce deforestation by dealing with the underlying economic causes of deforestation (%)

	Implemented and are largely effective	Implemented and are partially effective	Implemented and are not at all effective	No, not implemented	No, but could be effective if implemented	n
Reforming support to the agricultural sector to remove perverse incentives enabling inefficient agriculture on marginal lands	0	10	17	43	7	30
Generating alternative economic activities to attract marginal farmers off their land to higher returns from alternative occupations	0	7	31	24	28	29
Using spatially targeted policies to stimulate intensive agriculture	0	23	23	23	17	30
Incorporating sustainable forest management principles in infrastructure development plans	0	26	23	29	13	31
Limiting infrastructure development (e.g. roads, dams, etc.)	0	3	23	60	13	30
Public debt relief (reducing the need for forestry activities to generate revenue to repay debt)	3	3	10	50	7	30
Participation in trade agreements to reinforce producer-country reforms to forest governance	7	13	23	23	13	30

 Indicates the highest frequency response

5 Conclusion

Before presenting the conclusions, it is opportune to highlight a caveat to this research. Given the small sample on which it is based, the findings should be considered as issues deserving further exploration, with a larger samples and also more in-depth research carried out in a number of the most significant countries in terms of deforestation.

This exploratory research has found that governance causes of deforestation are perceived to be even more significant than the economic causes if one considers that poor enforcement of land and forest management regulations is the proximate cause of deforestation most frequently identified as 'of primary importance', followed by poor land and forest management regulations. In relation to the underlying causes, corruption was identified as being 'of primary importance' most frequently followed by insecure property rights.

Corruption was perceived to be widespread in the countries considered, both within and outside the forest sector. However, respondents were more likely to have direct experience of corruption in the broader economy than in the forestry sector. Corruption was seen as instrumental in facilitating illegal logging, though, interestingly, around two-thirds of the respondents thought that decentralisation processes have not led to an increase in corruption in the forest sector in the countries in which they work. As noted earlier in the paper, the relationship between decentralisation and corruption is much debated and this finding could appear to lend further support to arguments in favour of decentralisation. It should be noted, however, that the general caveat that this exploratory research is based on a small sample applies.

In relation to the effectiveness of policies designed to reduce deforestation by dealing with its direct causes, the more traditional measures (e.g. those dealing with forest management rules, concession policies, protected areas and land use planning) were most likely to be perceived as having been implemented and being partially effective. Other policies appear to not have been implemented or as not having been effective.

With regard to policies to reduce deforestation by dealing with the underlying economic causes, most policies have not been implemented or, if they have, are also considered not to have been effective. The exceptions are the use of spatially targeted policies to stimulate intensive agriculture and the incorporation of sustainable forest management principles in infrastructure development plans, which were considered to be partially effective by about a quarter of respondents. Overall, this finding on policies to address

the underlying cause seems to indicate a degree of political unwillingness to address deforestation at the root of the problem.

Acknowledgements

We thank Monica di Gregorio, Nalin Kishor, Mary Milne, Sarah Milne and Pablo Pacheco for their comments on the draft survey. This research was made possible by funding from the Australian Research Council (LP 0989909) and the Australian Agency for International Development (EFCC 082).

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