

Forests under pressure – Local responses to global issues

Editors:
*Pia Katila
Glenn Galloway
Wil de Jong
Pablo Pacheco
Gerardo Mery*



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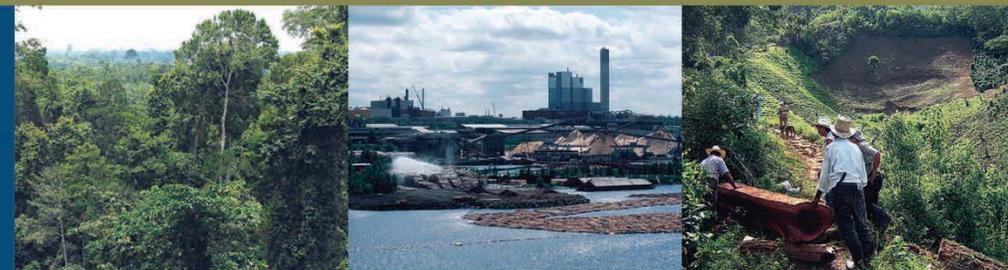


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IUFRO Headquarters
Hauptstrasse 7
1140 Vienna, Austria
Tel: + 43-1-877-0151-0
Fax: +43-1-877-0151-50
Email: office@iufro.org
Web site: www.iufro.org



Forest Stewardship Council certification of natural forest management in Indonesia: Required improvements, costs, incentives, and barriers

Convening lead author: Ruslandi

Lead authors: Art Klassen, Claudia Romero, and Francis E. Putz

Abstract: Voluntary, third-party, market-based forest certification has helped promote the transition from forest exploitation for timber to multiple-objective forest management in Indonesia. Here we describe the paths followed to Forestry Stewardship Council (FSC) certification of responsible management by five forestry concessions in Kalimantan, Indonesia. We found that while only modest improvements in forest management practices would be required for the concessions to comply with governmental regulations, much more substantial improvements were needed for FSC certification. Making these improvements was expensive mostly because the concessions lacked the required technical capacity and thus relied on support from outside institutions. We estimated that the direct costs of certification, half of which were paid by various donors, amounted to USD 300 000 to USD 700 000 per concession, with averages of USD 4.76/ha and USD 0.1/m³. Due to the minimal financial benefits the concessionaires received from certification of their forest products, external funds for the required technical inputs and audits were essential, but the business and marketing strategies of companies linked to the concessions also favoured certification. Forest certification is expanding in Indonesia for a variety of reasons, mostly related to partnerships between the private sector and civil society as well as in response to emerging synergies with the newly enacted government regulations (e.g. verification of timber legality and mandatory certification) and concerns about corporate reputations. Despite these facilitating factors, many barriers to certification remain, including unclear forest land tenure, perverse government regulations, high costs, lack of technical capacity, and scarcity of “green premiums” for certified forest products.

Keywords: Tropical forestry, forest certification, forest concessions, improved forest management, reduced-impact logging, forest degradation

15.1 Introduction

Indonesia’s approximately 131 million ha forest estate, all of which is owned by the national government, is designated for conservation (27 million ha), protection (29 million ha), and production (75 million ha, including about 10 million ha for plantations) (Ministry of Forestry 2011). Here we focus on the 25 million ha of production forest already allocated as natural forest concessions plus the ad-

ditional 18 million ha for which new or extended concession licenses are being processed. The number of timber concessions in Indonesia decreased from 577 in 1990, covering 59 million ha, to 285 in 2011, covering 25 million ha (45% and 19% of total forest cover, respectively). There were many reasons for these reductions but prominent among them were prior mismanagement and resource depletion by uncontrolled logging and wildfires combined with widespread conversion of logged forests into oil palm

and non-native timber plantations. It is nevertheless noteworthy that up to 1996 the rate of deforestation in concessions was estimated at only 77 000–120 000 ha compared to 623 000–2.4 million ha/year for all forest categories combined (Sunderlin and Resosudarmo 1997). The more recent study of deforestation in Sumatra by Gaveau et al. (2012) validates this result: deforestation rates in forest concessions and protected areas were similar but much slower than in other forests. The big challenge to be confronted in forest concessions in Indonesia is forest degradation due to unsustainable timber exploitation practices, not outright deforestation.

Timber harvests from Indonesia's rich natural forests contributed substantially to the country's economic development during the initial post-colonial era (Gautam et al. 2000). Unfortunately, most logging was and remains unnecessarily destructive despite enactment of forestry regulations as far back as the early 1970s (Annex II 15.1). Later, partially in response to the Convention on Sustainable Development declared at the Rio Summit in 1992 as well as in response to the Target Year 2000 campaign of the International Tropical Timber Organization (ITTO), the government of Indonesia (GoI) enacted a number of additional forestry regulations intended to promote sustainable forest management (SFM). Despite these new regulations and financial and technical support from several donor countries and international non-governmental organisations (NGOs), destructive forestry practices remained common. Unclear land tenure, weak law enforcement, collusion, and corruption, as well as the conflicting and inconsistent governmental regulations, were and remain root causes of poor forest management in Indonesia (Barr et al. 2006, Muhtaman and Prasetyo 2006, Tacconi 2007).

In response to the widespread failures of governments to curb destructive forestry practices in Indonesia and elsewhere in the tropics, coupled with concerns about the unintended impacts of boycotts of tropical timber (e.g. reduced values of standing forests), voluntary third-party forest certification arose in the 1990s as a market-based strategy to improve forest management (e.g. Auld et al. 2008, Price 2010). Among several certification schemes, the Forest Stewardship Council (FSC) has received the most support from international civil society organisations and is the most widely applied in the tropics (Atyi and Simula 2002). In Indonesia, FSC is the only voluntary certification scheme with international traction and it dominates in terms of certified area (91% of certified natural production forests in Indonesia). For these reasons we here focus on FSC certification but recognise that other certification schemes operate in Indonesia (e.g. Lembaga Ekolabel Indonesia, LEI) and a new, government-run, mandatory certification program (Pengelolaan Hutan Produksi Lestari, PHPL).

Starting with the first certified natural forest concession in Indonesia in 2001, growth in the area certified has been steady but modest. At the time of this writing (early 2013), nine concessions, with a combined area of natural forest of 1 011 287 ha (4% of the area of active concessions), were certified by the FSC (TFF 2012) and two other concessions had lost their FSC certificates (464 770 ha). In addition, 26 concessions in natural forests, with a combined area of 2.8 million ha, were ostensibly working towards certification (TFF 2012). This underlying dynamism in certification needs to be considered when formally evaluating the impacts of certification in Indonesia and elsewhere; simple comparisons of the number or area of certified and uncertified forest management units are clearly susceptible to making spurious conclusions (Romero and Castrén 2013).

This chapter describes how, despite unfavourable conditions such as unclear land tenure and inconsistent forest regulations, the concerted efforts of the private sector and civil society, including NGOs, facilitated the adoption of improved management practices and advancement of some forest concessions towards forest management certification (hereafter certification). We refer to responsible forest management instead of sustainable forest management because sustainability can only be determined in retrospect with lots of data collected over long periods of time, whereas certification represents an effort to assure compliance with the best available standards for forest management. Given the spatial scales and pace of logging in Indonesia as well as continued and widespread use of unnecessarily destructive timber harvesting practices, we believe that promotion of responsible forest management by certification remains a major strategic objective for conservation and development (e.g. Ebeling and Yasue 2009). Unfortunately, formal, field-based assessments of the effectiveness of forest certification in general, and in Indonesia in particular, remain to be carried out (Romero and Castrén 2013). While the impact of certification as measured by changes in the area certified is easy to calculate, the effectiveness and costs of certification in improving forest management practices are much less easy to determine (Moore et al. 2012, but see Gullison 2003, Newsom and Hewitt 2005, WWF 2005, Newsom et al. 2006). Despite the lack of rigorous, field-based evaluations of the impacts of forest management certification, its beneficial impacts are claimed to be substantial (e.g. Gale 2006, Muhtaman and Prasetyo 2006).

Here we employ a case-study approach to describe the pathways to FSC certification followed by five recently certified concessions in Kalimantan, Indonesia. We illustrate what kinds of on-the-ground improvements were required for the concessions to receive FSC certification. We also compare the requirements of FSC with those of government to high-

light overlaps, conflicts, and potential synergies. The information we present was derived from interviews and observations during frequent field visits to each of the concessions as they worked towards certification. We also report the associated direct costs of certification that we could track, most of which were covered by external agencies. Finally, to inform efforts to increase the effectiveness of this conservation intervention, we explore some of the reasons why the forest management units (FMUs) worked towards certification and the barriers encountered.

We hope that this descriptive study advances analyses of the impacts of forest certification and hence improves forest management in Indonesia and elsewhere by providing governments, donors, certifiers, and forest auditors with information useful in revising their policies and practices. As such, it constitutes a step towards a more formal evaluation of the impacts of certification of natural forests.

15.2 The legal framework for natural forest management in Indonesia

Regulation of natural forest management for timber in Indonesia began with enactment of a basic forestry law in 1967 followed by issuance of the regulations needed for its implementation (Annex II 15.1). These laws and regulations were implemented by a central government that did not recognise the traditional tenure rights of indigenous people and disregarded many social considerations important to sustainable forest management (e.g. involvement of local communities in forest management and protection of their cultural identities) (Wiersum 1995, Gunter 2011). The total area under timber concessions in Indonesia has varied over time. At their peak extent in 1993/1994, concessions covering 61.7 million ha were granted to private sector or state-owned firms for 20- to 70-year periods subject to satisfactory periodic evaluations by the Ministry of Forestry (MoF). Concessionaires were expected to pay a one-time concession fee that varied with the size and duration of the license period. Later, regulations were enacted that required regular payments into a reforestation fund (DR, Dana Reboisasi) and the payment of royalties (PSDH, Provisi Sumber Daya Hutan), both based on extracted timber volumes.

To guide concession forest management, in 1971–1972, the MoF developed the Indonesian Selective Cutting System (Tebang Pilih Indonesia, TPI). TPI set the minimum felling cycle at 35 years and the minimum felling diameters at 50 cm for production forest and 60 cm for limited-production forest in which logging is permitted but has restrictions due, for example, to steep topography (e.g.

25%–45% slopes). When TPI was revised in 1989 to require enrichment planting where necessary due to poor stocking, it became known as the Indonesian Selective Cutting and Planting System (Tebang Pilih Tanam Indonesia, TPTI). TPTI also regulated logging-block demarcation, inventory, logging, and post-logging silvicultural treatments.

In 2009 TPTI was radically revised; minimum cutting diameters were reduced by 10 cm, the minimum cutting cycle was reduced by five years, and enrichment planting along cleared lines was required regardless of post-logging stocking. This approach to intensive silviculture is referred to by the Indonesian acronym SILIN. We note that the intensification of natural forest management required by SILIN completely contradicts the recommendations of dozens of Indonesian and other researchers over the past decades (e.g. Appanah 1998, Kuusipalo et al. 1997), and came as a surprise to many. Efforts are currently underway to understand why the MoF decided to disregard the recommendations of researchers to reduce harvest intensities (e.g. Sist et al. 1998, 2003b), to lengthen cutting cycles (Ruslandi 2002, Sist et al. 2003a, Van Gardingen et al. 2003), and to avoid the high environmental and economic costs of enrichment planting except where absolutely necessary (Ådjers et al. 1995, Appanah and Weinland 1993). The new regulations also fail to require what researchers and certifiers accept as critical to sustainable forest management: the protection of forest structure and soils through the use of reduced-impact logging (RIL) techniques (e.g. Putz et al. 2008).

According to Indonesian law, before concessions can begin to log, the MoF must approve their long-term (10-year) as well as more detailed annual work plans. Annual work plans are supposed to be based on 100% inventories of commercial species >20 cm dbh (stem diameter at 1.3 m or above buttresses) and must include road plans and tree position maps. Unfortunately, partially because detailed harvest plans are not required, typical logging is unnecessarily destructive. Furthermore, plan approval is a very political and idiosyncratic process with many unexplained delays and few apparent on-the-ground benefits. Once MoF approval is granted, trees are felled with chainsaws and logs are skidded by bulldozers (i.e. crawler tractors) to roadside log landings from where they are hauled by logging trucks to log ponds or other places where they are sold and shipped to various forest-product industries in Indonesia (log exports were banned in 1983). The logs are primarily used for plywood, but some go for other uses such as flooring and furniture from bangkirai (*Shorea leavis*) and merbau (*Intsia* spp.). In addition to regulations issued specifically for the forestry sector, concessions are expected to comply with other laws, such as those related to environmental impacts and worker rights.

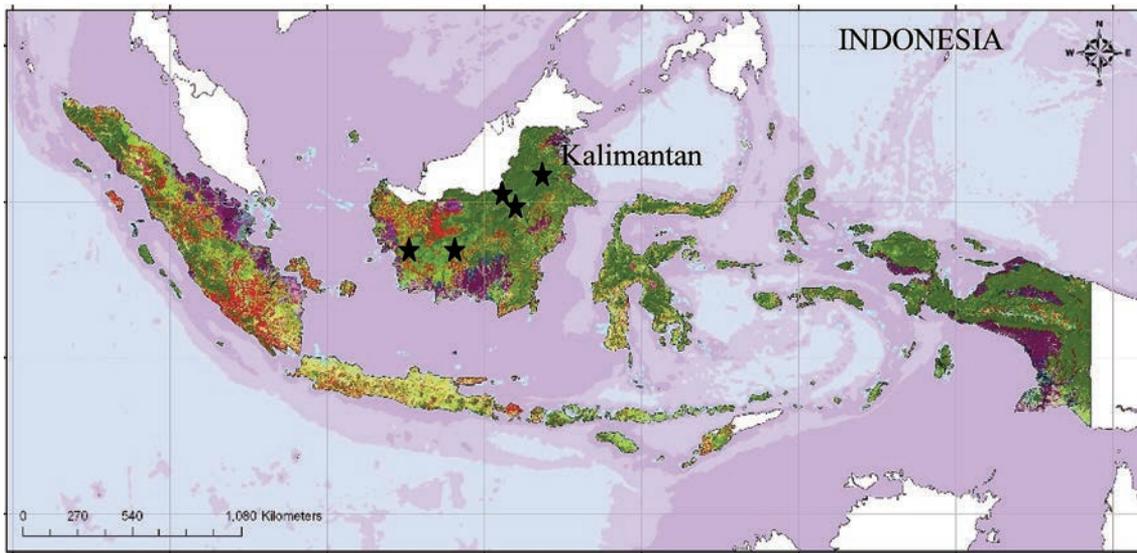


Figure II 15.1 The five concessions in this case study, (indicated by black stars on a 2005 land cover map from Ekadinata et al. 2011) are all in closed-canopy lowland dipterocarp forest in Kalimantan, Indonesia.

15.3 Methods

15.3.1 Study site

This study is based on the experience of the Tropical Forest Foundation (TFF) in five concessions in Kalimantan, Indonesia, that were eventually certified (Figure II 15.1). From the nine FSC-certified concessions in Indonesia, of which eight are in Kalimantan, we selected these five because they followed similar paths towards certification, which facilitates cost comparisons. The five concessions are managed by the four major forest company groups in Indonesia to which all certified concessions in Kalimantan belong. The four other FSC-certified concessions were either located in other forest types or received the kind of external support for which accounting is difficult. All five concessions studied (Table II 15.1) are in lowland forests dominated by tree species in the Dipterocarpaceae, with topographical conditions ranging from gently sloping to moderately hilly; only small areas have slopes > 45%, which is the legal limit for ground-based logging.

15.3.2 Focus on seven components of forest management

We endeavour to elucidate the likely impacts of FSC certification by describing the differences in management practices required by the government and for certification. Information was gathered from the concessions' certification preparation reports, audit reports, and field observations during repeated

visits to each concession. We visited each logging operation at three- to four-month intervals during the three years leading up to their certification. Due to lack of quantitative data for on-the-ground forest management practices (i.e. a formal evaluation), we focus only on those practices that we observed. Although we made some use of formal corrective action requests (CARs) issued by auditors and reportedly addressed by the concessions (for an example of this approach to impact analysis, see Peña-Claros et al. 2009), we cross-checked this information during repeated site visits to avoid possible biases (Romero and Castrén 2013).

The analysis focuses on seven basic components of forest management derived from FSC principles (FSC 2012) that are used by TFF and the Forest Trust to assist concessions move towards certification (Table II 51.2). For each of these components, we later compare the relevant government regulations and FSC requirements (see Table II 15.4, section 15.4.2) and assess implementation success based on repeated field visits, audit reports, and analysis of CARs.

15.3.3 Partial accounting of the costs of certification

The reliable data on the costs of forest certification are those covered by external agencies for activities such as formal audits, training programs, and biodiversity surveys. Data on the direct costs borne by the concessions as they worked towards certification is more scarce and we have no data on the indirect costs (or benefits) of certification that result from

Table II 15.1 Characteristics of the five FSC-certified forest concessions in this case study.

Variables	Concession				
	RMT	BRT	SJM	SPT	NKR
Area	69 620 ha	97 500 ha	171 340 ha	216 580 ha	41 540 ha
First license	1973	1976	1982	1992	1989
Location	East Kalimantan	East Kalimantan	West Kalimantan	Central Kalimantan	East Kalimantan
Owner	Tirta Mahakam	Intertrend	Alas Kusuma	Kayu Lapis	Intertrend
Annual cutting area	1430 ha	2500 ha	3240 ha	5000 ha	1000 ha
Annual harvest	75 120 m ³	170 280 m ³	191 510 m ³	227 600 m ³	27 000 m ³
Harvest intensity	52.5 m ³ /ha	68.1 m ³ /ha	59.1 m ³ /ha	45.5 m ³ /ha	27 m ³ /ha
Products and principal markets	Plywood and floor base. Japan with some sales to SE Asia and Europe	Local log sales (some export of finished products)	Plywood and molding to Japan, Korea, N.America, Australia	Plywood, flooring, and molding to Japan, Europe, N.America	Local log sales (some export of finished products)
Year Certified and Certifying Body	2012 Control Union	2011 Control Union	2010 Control Union	2011 SmartWood	2011 Control Union

Abbreviations: RMT = Roda Mas Timber, BRT = Belayan River Timber, SJM = Suka Jaya Makmur, SPT = Sarmiento Parakantja Timber, NKR = Narkata Rimba

Table II 15.2 Forest management components used in this study and their reference to FSC principles.

FM components used in this study	FSC principles
Compliance with laws and satisfaction of financial obligations	#1
Implementation of reduced-impact logging	#5, #6, #7, #8
Social impact assessment and community development programs	#3, #4
Environmental management and monitoring plans	#6, #8
Biodiversity conservation	#9
Worker rights, health, and safety	#2
Yield sustainability and silviculture	#7, #8, #10

changes in harvest volumes and schedules. Although these limitations result in underestimates of what it actually costs the concessions to achieve certification, the focus on the major steps they took and their costs nonetheless seem instructive. Obviously, more complete analyses of the financial costs and benefits of certification are needed if forestry firms and supporting agencies are to make informed decisions about their investments.

15.3.4 Identifying motivations for and barriers to certification

Semi-structured interviews with nine high-ranking representatives from the five concessions (i.e. forest managers, marketing personnel, and senior administrative field staff) were conducted in 2011–2012 during TFF field visits and meetings with staff members of the concessions. The interviews assessed the market benefits from certification (i.e. increased market share, price premiums) received by the concessions, other sources of motivation for FSC certification, and perceived barriers to certification.

15.4 Findings

15.4.1 Steps and time taken towards certification

The strategies used by the five concessions to obtain certification, as well as the rates of progress towards this goal, varied with their interests and capabilities. Although all five concessions received technical assistance from TFF and implemented TFF's step-wise approach to certification (Table II 15.3), some chose not to receive formal recognition for each level of achievement because the expected market benefits would not be sufficient to cover the required audit fees.

15.4.2 Forest management improvements to comply with FSC standards

For each of the seven forest management components (Table II 15.2), governmental and related FSC requirements are compared in Table II 15.4. We also make a first and admittedly incomplete attempt to assess compliance with both requirements based on audit reports and our repeated visits to each concession.

Due to lack of governmental control over logging operations, lack of trained staff, and ambiguities about what is required, forest management practices in most concessions do not even reach government standards.

The forest management practices employed in the five concessions before they formally started working towards FSC certification were quite similar and among the best in Indonesia. We base this claim on our own observations plus their having received high PHPL certification scores, which indicates that they were in compliance with most governmental regulations related to sustainable forest management. Despite their comparatively good forest management practices, these concessions still needed to make substantial improvements to comply with FSC standards. This finding implies that most other concessions in Indonesia would require even more adjustments in their management practices to achieve certification.

Attainment of FSC certification required concessionaires to make long-term business commitments that respect the ecological and social dimensions of forest management, instead of just maximising log production. Certification also required more stakeholder input and generally helped open concessions to public scrutiny. The forest management practices required by the FSC are more demanding than those required by the MoF (Table II 15.4). In particular, substantial investments in the social and ecological dimensions of forest management were required by FSC. For example, investments were required in environmental monitoring equipment, protective gear for workers, and capacity building for monitoring biodiversity and general environmental impacts. In addition, substantial changes in logging practices were often required. Some of the required improvements were beyond the capacities of the concessions to implement on their own, thus the need for external inputs. Based on the analysis of certification action plans and the CAR closures as well as field visits, the most evident implications of certification for forest management practices are summarised below.

1) Logging operations: Concessions changed their timber harvesting practices from “conventional” logging, which was unnecessarily destructive, to RIL, which requires substantial changes in planning and forest operations as well as major investments in human resources (e.g. training of fellers and tractor operators, upgrading of planning staffs and logging supervisors, and hiring of monitoring crews, Figure II 15.2). In addition to changes in logging techniques, required changes were made in operational arrangements and payment systems – for example, workers in certified operations receive bonuses for compliance with RIL guidelines rather than just volume-based pay-

Table II 15.3 Steps towards FSC certification taken by forestry concessions in Kalimantan.

Steps towards certification	Concession				
	RMT	BRT	SJM	SPT	NKR
Legality verified	2008	Not requested	2003	2008	Not requested
RIL verified	2011	Not requested	2004	2010	Not requested
Year certified and certifying body	2012 Control Union	2011 Control Union	2010 Control Union	2011 SmartWood	2011 Control Union
Time to certification	10 years	3 years	7 years	8 years	3 years
History of engagement					
RMT	Began formal RIL training in 2002; external inputs to deal with social dimensions of certification; external HCVF assessment (TNC); technical guidance through the certification process with TBI support.				
BRT	Initiated external engagement in 2009; RIL training and an overall technical review followed by inputs on social issues; university collaboration on research; technical guidance, including HCVF assessment under TBI.				
SJM	First engagement for RIL training began in 2003; subsequently received technical input on HCVF assessment (TNC and FFI), social baseline and impact assessment and training, wildlife surveys, conservation management plan preparation, and other technical guidance with TBI support.				
SPT	Started RIL training in 2003; external assistance on social impact studies and conflict resolution training; HCVF assessment (TNC and FFI); inputs from university researchers on silviculture technical guidance under TBI.				
NKR	Received technical inputs for defining the social dimension and conflict resolution training starting in 2009; HCVF assessment by TNC; technical guidance under TBI.				

See Table II 15.2 for company abbreviations; FFI = Flora Fauna International, TNC = the Nature Conservancy, TBI = the Borneo Initiative, TFF = the lead technical advisor for these concessions, RIL = reduced-impact logging, HCVF = high conservation value forests.

ments. RIL protocols and comprehensive monitoring systems for logging operations were also developed. To be in compliance with RIL standards, logging equipment in certified operations is typically better maintained. For example, tractors need to be equipped with winch cables long enough to allow them to remain on designated skid trails, thereby avoiding unnecessary soil compaction. Another requirement for FSC certification is that skid trails need to be well-planned, located outside of riparian buffer zones and off of steep slopes, and deactivated at the end of harvest operations to reduce soil erosion. Finally, safety requirements and training are also emphasised. In certified concessions, monitoring crews evaluate the implementation of logging operation for compliance with RIL protocols after the harvest in each logging block is completed. The results of this evaluation are used to determine the size

of worker bonuses and also for approval for the logging crews to move to the next cutting block.

2) *Biodiversity conservation and environmental protection*: As a requirement for certification, extensive baseline biodiversity assessments were conducted in the five concessions. These surveys employed biodiversity experts from external agencies but also involved training of concession staff members. The results of the biodiversity surveys included lists of endangered species as well as maps of unique ecosystems found in the concession areas. With this data, the experts collaborated with concession staff members to develop conservation management plans. By focusing on training, the concessionaires hope that future conservation management plans and biodiversity surveys will be the responsibilities of their own staff members, which will reduce costs.

Another certification-motivated change was to

Table II 15.4 Comparisons of governmental and FSC requirements and their interactions.

FM components	Governmental regulations	Implementation
Compliance with regulations and satisfaction of financial obligations	Comply with TPTI rules. Comply with labour and environmental laws. Pay reforestation fees (DR) and forest royalties (PSDH). Compensate local communities (about USD 1/m ³ in Kalimantan and USD 10/m ³ in Papua). Issuance of annual cutting permits and license renewals conditional on legal compliance, as determined by external auditors (SVLK).	Lack of enforcement of governmental regulations, especially labour and environmental laws. The required financial compensation paid to local communities is less than what they requested.
Implement reduced-impact logging (RIL)	RIL is the MoF's principal proxy for SFM in their mandatory forest certification program (Pengelolaan Hutan Produksi Lestari – PHPL). Prepare tree position maps and plan logging roads, but these are only administrative requirements.	Insufficient governmental regulation to implement RIL. Government regulations can be satisfied with RIL training and installation of demonstration plots.
Environmental management and monitoring plan	Prepare environmental management and monitoring plans (Analisis Dampak Lingkungan – AMDAL) for reduction and monitoring of soil erosion, protection of flora and fauna, and community development programs. Prepare annual reports on plan implementation.	Little control on implementation of environmental plans. Documents are prepared, but the implementation reports are seldom if ever prepared; if prepared, there were no responses from the relevant governmental agencies.
Biodiversity conservation	No explicit regulations require biodiversity conservation at the concession level. Small portions of concessions should be set aside to protect genetic resources.	Set-asides are not always located in places that maximise their conservation value. Instead unloggable areas are over-represented.
Social impact assessment and community development programs	Concessions are required to develop social programs for local people (MoF Decree 691/Kpts-II/1991)	This regulation was not enforced and largely failed to improve company-community relations. The legal rights of local communities, including indigenous people, are not recognized. In many cases, unclear land tenure is a source of conflict between concessions and communities.
Worker rights, health, and safety	Concessions should follow the labour law (UU 13/2003) and regulations related to worker health and safety.	Government oversight of implementation of these regulations was generally weak or non-existent. No detailed guidelines to comply with safety procedures.
Yield sustainability and silviculture	Comply with TPTI (MoF Decree 485/Kpts/II/1989 and MoF Decree P.11/Menhut-II/2009)	Research indicates that sustainability is unlikely under TPTI, especially with SILIN.

Table II I5.4. Continued

FM components	FSC requirements	Comparisons
Compliance with regulations and satisfaction of financial obligations	In addition to complying with national and local laws, concessions should recognise and respect local community rules; negotiate and make an agreement on the compensation fee for the communities; deal with FSC rules that sometimes contradict national regulations (e.g. SILIN rules require unsustainable logging intensities); provide evidence of balanced attention to social, ecological, and production issues; and provide documentation for forest delineation and resolve any related conflicts.	FSC requirements complement and strengthen governmental regulations for several aspects (e.g. satisfying financial obligation to the state and communities and timber legality verification). Forest boundary delineation is the government's responsibility but concessions are required to document efforts to resolve boundary disputes. Governmental regulations and FSC requirements conflict in regard to silviculture.
Implement reduced-impact logging (RIL)	<p>Preharvest timber inventories and contour mapping.</p> <p>Harvest plans reflect established standards for operations, environmental protection, and utilisation.</p> <p>Felling and bucking methods prioritise worker safety, ensure efficiency, and minimise logging waste.</p> <p>Efficient and low environmental impact skidding with planning and operational controls down to the individual tree level.</p> <p>Deactivation activities (e.g. post-logging road and skid trail closure) to reduce soil erosion and restrict illegal access.</p> <p>Construct and maintain logging roads so as to minimise soil erosion and facilitate log transport.</p> <p>Monitor compliance with RIL guidelines and ensure company-wide utilisation.</p> <p>RIL training and supervision.</p>	<p>FSC requires the change from timber exploitation to forest management, which means that long-term forest values should be considered.</p> <p>TFF judges RIL compliance with a weighted scoring system having 13 criteria and 33 indicators (>80% indicates success). Total compliance with MoF rules would be equivalent to a score of 23% (based on TFFs 2006 RIL Standard).</p> <p>TFF's RIL Standard, which was adopted by most certification bodies in Indonesia, requires concessions to implement RIL >80% of their logging blocks.</p>
Environmental management and monitoring plan	<p>Integration of monitoring protocols and results into forest management plans as well as making public the results of these monitoring activities.</p> <p>Infrastructure changes generally required for fuel handling, recycling, and general waste management.</p>	FSC requirements reinforce governmental regulations.
Biodiversity conservation	<p>Extensive training and substantial investments in external consultants are required for HCVF surveys and development of biodiversity management plans.</p> <p>Other required HCVF-related activities include stakeholder consultations and incorporation of habitat protection and monitoring into planning and operational procedures.</p>	<p>FSC introduced new concepts and practices.</p> <p>Most concessions lack the capacity to carry out the required HCVF assessments.</p>
Social impact assessment and community development programs	<p>Social baseline surveys and social impact assessments.</p> <p>Help with community development programs using participatory processes.</p> <p>Monitor social impacts and evaluate program effectiveness.</p> <p>Resolve land tenure and other rights issues on a case-by-case basis using procedures developed by the concession.</p> <p>All activities that affect communities need to be preceded by community consultations with broad stakeholder participation</p>	FSC requires more accommodation of the needs and desires of local communities.
Worker rights, health, and safety	<p>Comply with all national regulations and international conventions related to workers.</p> <p>Proper safety equipment provided and utilized.</p> <p>Adequate training and supervision provided and documented.</p>	FSC strengthened the implementation of government regulations.
Yield sustainability and silviculture	<p>Intensive growth and yield monitoring is required.</p> <p>Harvest levels should be revised based on monitoring results.</p> <p>Logging intensities should be reduced and logging cycles lengthened.</p>	<p>Governmental regulations include contradictory requirements intended to promote sustained yields.</p> <p>Both government regulations and FSC requirements do not have clear silvicultural requirements.</p>



Figure II 15.2 Reduced impact logging training in a concession preparing for FSC certification.
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prohibit hunting of endangered species by concession employees. In the certified concessions, this rule was formally and repeatedly issued by the forest managers to the workers. Judging from the frequency with which we encountered game species during our field visits, we believe that this prohibition was effective.

Certified concessions routinely monitored soil erosion and stream sediment loads and utilised this information to improve their environmental management plans. The management plans include protection of streamside buffer zones, rehabilitation of degraded land, and handling and disposal of lubricants, fuel, and other chemicals. Substantial investments in environmental management and monitoring systems were required to comply with FSC standards. In uncertified concessions, few of the government-required plans for environmental management or monitoring plans were properly implemented.

3) *Community relations:* Although the GoI issued a decree that required concessions to develop community development programs, this regulation was not enforced and largely failed to improve company-community relations. In contrast, to get FSC certification, social impact baseline assessments were carried out in communities neighbour-

ing the concessions. These assessments employed participatory processes to identify community needs and design community development programs. The concessions funded these programs and also paid the government-stipulated timber fees to local communities. For example, the concessions assisted neighbouring communities in the development of village cooperatives and local businesses.

One of the certified concessions in this study provides another example of effective company-community partnerships. In this concession, industrial-scale trials are being carried out with an alternative timber-yarding system developed by local communities. Instead of relying only on bulldozers, logs in this system are yarded to roadsides or main skid trails with what are called “mono-cable winches.” These relatively simple devices consist of a diesel engine, a truck transmission, and a spool with 100 m of cable mounted on a metal sled. Starting from a logging road, the sled is winched out to the felling area and back again with a log, thereby reducing the need for skid trails. Mono-cable winches are assembled locally and cost a small fraction of even a refurbished bulldozer. While they yard logs much more slowly than bulldozers and require twice as many work-

ers, the yarding costs are much lower due to low investments in equipment and fuel. In addition to employing local workers, the principal environmental benefits of mono-cable winches compared to skidding logs with bulldozers are that compaction and mineral soil exposure are minimal and collateral stand is nearly imperceptible.

FSC auditors also required certified concessions to develop and implement conflict resolution protocols to deal with disputes with communities. Land tenure conflicts, which are rooted in the lack of clarity about the tenure rights of local communities, were common but typically beyond the capacity of concessions to resolve. For example, several concessionaires were asked by communities to release the land occupied by those communities. As reasonable as this request seems, if the concessionaires were to agree, this sort of unilateral action would be illegal because forest lands in Indonesia are owned by the central government. Although it is not reasonable to expect forest certification to resolve fundamental land tenure conflicts, certified concessions occasionally did resolve conflicts related to forest utilisation rights. For example, the rights of local communities to collect non-timber forest products, including traditional medicines, were respected. Certified concessions also mapped and protected cultural sites of local communities located in their logging blocks.

- 4) *Worker safety and welfare*: Certified concessions provided workers with safety equipment (e.g. helmets, safety boots, and gloves) and, through monitoring and supervision, made sure that the equipment was used properly. Worker training on safety issues was also required, carried out, and reported. In addition to addressing safety issues, worker welfare in certified concessions was addressed through the provision of adequate housing, education, and health facilities.
- 5) *Transparency and stakeholder participation*: Certified concessions were required to consult with local communities about mutually relevant management activities. For example, the HCVF consultations and social impact assessment reports showed that the inputs from stakeholders were recorded and verified by the auditor for their incorporation into management plans. Local communities were informed about forest management activities and were invited to the traditional ceremonies conducted before the annual forest management activities began. Public summaries of forest management plans were also made available. Although all five case-study concessions fell short of the FSC's requirement of equality of communities and concessions in making decisions of relevance to both, we believe that the process of certification led them closer to this lofty goal. It is

clear that by being certified, concessions are more open to scrutiny not only by the government but also by other stakeholders. While this increase in scrutiny might impede further certification, except for the concessions that are certified, it serves to increase the transparency of decision-making and fosters stakeholder input about concession activities that affect communities.

15.4.3 Some of the financial costs of FSC certification

Financial support and technical guidance by a range of international institutions were provided to all five concessions in this case study to cover the costs of training, planning, and auditing (Table II 15.5). NGOs that supported certification included TNC, WWF, Flora & Fauna International (FFI), and TFF. These NGOs received their funds mostly from bilateral and multilateral donors such as the United States Agency for International Development (USAID) and ITTO. TBI, a Dutch NGO, contributed USD 2/ha to cover the costs of certification audits and associated activities.

We have reliable data on the financial support for certification from outside agencies, but less data on the internal costs borne by the concessions. These internal costs assumed by the concessions include increased staffing of forest inventory and planning departments, the hiring of specialists in biodiversity and social/community relations, and infrastructure improvements required to comply with certification requirements on erosion control, pollution, and sanitation. Certified concessions may also incur indirect financial costs related to foregone timber in areas where harvests are prohibited on steep slopes and in other set-asides; we have no clear indications of such costs in the concessions we studied, but they may be possible. Also, at least some of the indirect costs associated with foregone timber are probably recovered by the improved efficiency of logging operations in certified concessions. What is clear is that all of the costs of certification – direct, indirect, compensated, and internally assumed – varied with the quality of forest management practiced when they first started on the path to certification. With all these caveats in mind, we estimate that the costs of certification borne by concessionaires are equal to those supplied by outside agencies. This estimate is supported by the 50–50 cost-sharing assumption on which contracts for support of certification between TBI and the concessions were made.

Certification costs covered by external agencies ranged from USD 151 339 to USD 354 371 per concession and USD 1.07 to USD 3.64/ha for an average

Table II 15.5 Costs of forest certification covered by outside agencies.

Direct costs	Concession name, amounts in USD				
	RMT	BRT	SJM	SPT	NKR
Certification workshops for all levels of concession staff and/or gap assessment/scoping by TFF (preparation for pre-assessments; funded by TFF)	0	10240	15500	0	
Preparation of certification action plans based on results of pre-assessments (provided by TFF and funded by TBI)	16206	15347	36901	14858	8930
RIL training (provided and funded by TFF)	45000	30000	45000	25000	0
Socio-economic baseline/impact and training (provided and funded by TNC)	16370	16165	22000	47000	20000
HCVF assessment and public consultation (TNC and TBI funded)	60000	54482	80000	50000	65350
Conservation plans; wildlife censuses/studies (funded by WWF)	0	0	80000	10916	0
Growth and yield synthesis (provided by consultants and funded by TBI)	0	0	3300	6410	0
Worker rights, health and safety training (funded by TBI)	5034	0	7500	0	0
Assessments by certification body: Pre-assessment (i.e. scoping visits)	13918	13164	8740	18500	14200
Full assessment	22474	27200	27700	29681	18548
Final verification audit (funded by TBI)	10488	6500	5400	0	7048
General technical guidance up to certification (provided by TFF and funded by TBI)	12967	16337	12330	4950	2904
Miscellaneous external costs covered by various external funding sources (e.g. ITTO and Flora & Fauna International Indonesia)	5850	20000	10000	25000	14359
Total covered costs of certification	208307	209435	354371	232315	151339
Covered certification costs per unit area (USD/ha)	2.99	2.15	2.07	1.07	3.64

of USD 2.38/ha (Table II 15.5). Generally, the larger the concession area, the lower the per-hectare costs because many cost elements are area-independent. It is more difficult to establish any meaningful relationships between certification costs and harvest rates because annually allocated harvest areas, volumetric yields, and concession size are only weakly related. Nevertheless, assuming an average yield of 50 m³/ha (Table II 15.2) and an average cost of certification of USD 4.76/ha (externally provided funds plus the assumed costs paid by the concessions), the direct costs are only about USD 0.1/m³ (USD 0.04–0.26/

m³). To put this estimate into perspective, the harvest costs up to the log landing for uncertified firms in Kalimantan averaged about USD 80/m³ (Ruslandi et al. 2011). Unfortunately, due to insufficient data about the direct and indirect financial benefits of certification, we cannot yet calculate cost-benefit ratios.

15.4.4 Incentives for responsible forest management and certification

Given that the companies received few market benefits from certification (partially because their principal markets were in Asia), we need to look elsewhere for motivation. Based on interviews with concession managers, it appears that improved professionalism, interest in the company's reputation, and expected benefits from increased efficiency of logging operations were the most important factors motivating certification. That said, expectations of market benefits for specific timber products and other financial benefits also continued to provide motivation for seeking FSC certification.

According to the concession employees interviewed, previous experience working with international research organisations and projects (e.g. the Center for International Forestry Research, CIFOR; the Natural Resource Management Project of USAID, Indonesia-UK Tropical Forest Management Project, and the Sustainable Forest Management Project of the German Technical Cooperation, GTZ) and non-governmental organizations (e.g. TFF, WWF, FFI, and TNC) helped prepare their staffs to implement responsible forest management and to achieve certification. Overall, the following four broad sources of motivation for implementing responsible forest management and seeking certified were apparent:

1) *Expectations of market benefits and returns on investments in certification:* The strongest motives for pursuing certification were apparently related to the business strategies of the concessions and associated industries. In particular, concessions aimed to attract green investors and continued to hope that certification would lead to premium prices for their products and increased market access. The one concession that was part of a public-traded company on the Jakarta Stock Exchange enjoyed a stock-price benefit that they attributed to the credibility associated with certification.

Although green premiums on certified products were neither large nor common and varied among products and markets, based on interviews with marketing managers, some concessions received green premiums on some of their products. For example, a premium of 10% to 15% was reportedly paid by markets in Europe for naturally durable lawn furniture made from bangkirai (*Shorea leavis*). In contrast, premiums on certified commodity products such as plywood were only 2% to 4% and only on specific grades and in certain markets. Certification also reportedly improved access to European and, increasingly, Japanese markets, particularly for high-quality panel prod-

ucts. Closure of some markets to non-certified goods in Europe increased the importance of the less-discerning markets of India and Middle Eastern countries.

- 2) *Increased professionalism and concerns about corporate reputations:* Three of the five certified case-study concessions received no market benefits from certification and, given their business strategies, are unlikely to do so in the future. For these concessions, commitments to responsible forest management and certification were reportedly based on desires for professional improvement and more efficient management. Certification also enhanced firm reputations, which improved relations with regulatory agencies as well as with environmental and social welfare advocacy groups.
- 3) *Availability of external funding and technical support:* As we documented, certification is an expensive, complicated, and long process that requires capacities that many concessions lack. For these reasons, external funding and technical support were critical for the move toward certification of the five concessions we studied. All five reported that technical assistance from NGOs on FSC requirements, such as HCVM management and monitoring, were especially critical because they lacked the required capacities among their own staffs.
- 4) *Government regulations and international agreements:* In 2009 the MoF enacted regulations designed to strengthen its technical oversight of forest concessions. In particular, MoF instituted a system for legality verification (Sistem Verifikasi Legalitas Kayu, SVLK) and made mandatory their own scheme for certification of logging operations (Pengelolaan Hutan Produksi Lestari, PHPL). These regulations were motivated in part by the Forest Law Enforcement and Trade (FLEGT) program and its Voluntary Partnership Agreements (VPAs) but were enacted before the VPA with the European Union was signed. These requirements provide additional pressure on companies to comply with MoF regulations, which in turn fosters achievement of FSC certification. Presidential decrees on combating illegal logging and timber trade also reduced market supplies of illegal logs, which should increase log prices and thereby help legal concessions avoid bankruptcy and foster forest management certification.

15.4.5 Barriers to improved forest management and certification

Challenges faced by concessions in achieving forest certification were not only technical and financial but also related to factors over which they had little control. Interviews with concession staff revealed noticeable increases in incentives for certification but persistent barriers, including the following six barriers.

1) *High costs of improving forest management practices and of certification:* The cost of improving management practices up to FSC standards is the main barrier to forest certification in Indonesia. To this cost should be added the indirect costs of profits foregone from timber left standing in set-asides.

2) *Lack of market incentives:* Although attainment and maintenance of forest certification increase the cost of forest management, market incentives (i.e. price premiums and increased market access) for certified Indonesian forest products are still mostly lacking. Indonesia's green market share for its forest products is particularly small and its products are disadvantaged by the higher shipping costs to Europe and North America compared to those of its traditional market in Japan and Korea. Moreover, the Japanese pay very competitively for Indonesian plywood. It is unlikely that the market share of certified Indonesian forest product in eco-sensitive markets will increase, unless there is a price premium sufficient to offset the higher shipping costs.

Most concessions in Indonesia, including those we studied, are somewhat isolated from market pressures and signals because forest product sales are controlled by the industrial divisions of the concession company groups to which they are tightly linked. This also means that market incentives and disincentives (e.g. threatened boycotts) are probably not the most important drivers towards FSC certification in Indonesia, at least not at the concession level. Despite the limited benefits from the supposedly market-based program of forest certification, for integrated forest companies the strong pulls for certification came from the timber-processing and sale sections of each concession's company group; green-premium hopes apparently persisted.

3) *Lack of effective government incentives for responsible forest management:* The SLVK and PHPL regulations simultaneously promote and discourage independent, voluntary third-party certification. The disincentive is large if concessions are charged separately for SVLK, PHPL, and FSC audits. Official governmental recogni-

tion of FSC certification would clearly solve this redundancy problem. Another example of how a governmental regulation discourages responsible forest management is the new set of government-mandated silvicultural requirements referred to as SILIN. Although the required intensification of forest harvesting through decreased minimum-felling diameters and shortened felling cycles should increase short-term profits, the required enrichment planting along cleared lines is expensive and generally unnecessary given the abundance of natural regeneration of commercial species.

Another example of governmental policies that discouraged responsible forest management and FSC certification is the 1999/2000 GoI decree that limited the size of concessions to 50 000 ha. Although enacted in the spirit of decentralisation and to attract more firms into the forest sector, it caused a number of forest industries to collapse due to raw material shortages. Also, many of the small concessions created by the break-up of several large concessions were incapable of responsible forest management due to financial and technical limitations. Furthermore, the way the decentralisation happened facilitated illegal logging and increased deforestation (Burgess et al. 2011).

Even after the push towards decentralisation in Indonesia in the late 1990s, spatial planning and the setting of forest estate boundaries remained under the control of the central government. This meant that there were few real changes in land tenure regimes or community access to forests. Nevertheless, partially because decentralisation rhetoric changed community perceptions about their rights to forest land, conflicts between communities and forest concession holders increased (Barr et al. 2006). Unfortunately, the government left the responsibility for resolving these conflicts to the concessionaires, most of whom lacked the necessary capacity to do so. Despite the fundamental need for the GoI to address land tenure issues, the systems for dealing with communities that were required by the FSC and set up by the concessions did prove useful in resolving some local land-tenure disputes.

4) *Technical capacity constraints:* Reaching the standards of management required by the FSC typically exceeded the capacities of concession staffs. A prominent example of this deficiency relates to the requirements for HCVF assessments, management, and reporting. FSC requirements related to the social dimension of the forest concession also exceeded the capacities of many concessions. Another example is the need for trained tractor operators and fellers to implement RIL. One cause of these deficiencies in trained personnel is that concessions often lose trained employees to

other sectors such as mining and palm oil. Rapid turnover in trained staff makes the concessions reluctant to invest in training, which has to be a continuous process. One obvious option would be for the concessions to provide larger incentives to trained workers to encourage their retention, which would have the additional advantage of helping professionalise the workforce.

Limited availability of trained workers is a problem shared by certification bodies in Indonesia. Trained auditors with experience in Indonesian forests and knowledge of Indonesian forestry are particularly scarce. Among the consequences of this scarcity are high costs, inappropriate recommendations, and overall loss of credibility of voluntary third-party certification. Inclusion of auditor training in the forestry curricula of universities in the region would help fill this void.

- 5) *Irrelevant and unrealistic requirements for certification*: Several requirements for FSC certification in Indonesia are difficult to satisfy and seem inappropriate to both the forest managers interviewed and the authors. For example, the requirement for annual monitoring of reptiles, birds, and other faunal groups in all identified HCVPs far exceeds the capacities of all concessions; satisfying this requirement necessitates repeated hiring of expensive teams of external experts. Similarly, the requirement for concessions to manage non-timber forest products (NTFPs) is generally irrelevant, particularly the requirement to prepare management and marketing plans. Timber concessions in Indonesia are granted only for timber management and utilisation, which renders requirements related to NTFPs beyond their mandates (Annex II 15.1).
- 6) *Confusion over land tenure and forest access*: In response to changes in the rules governing forest access by local communities (Annex II 15.1) and the attraction of farming in newly accessible areas, local villagers often establish farms along main logging roads in both certified and uncertified concessions. Typically forest is cleared for the purposes of swidden and more permanent agriculture up to 250 m from main roads, especially close to camps established for concession employees. Such clearing is contrary to FSC rules but nearly impossible for concessionaires to control due to lack of government support for the actions that would be required as well as to the social and political friction that eviction would generate.

15.5. Discussion

15.5.1 Forest certification impacts

Lack of an empirical evaluation of the impacts of forest certification in Indonesia or elsewhere make it difficult to specify its impacts (Romero and Castrén 2013). Prominent among the reasons for the lack of a proper evaluation of this well-recognised and widely supported conservation intervention are high costs and technical difficulties (Moore et al. 2012). Evidence for the effectiveness of certification of natural forest management in the tropics that is available to date is from indirect assessments based on the evolution of CARs and on surveys of the opinions of people involved in the certification process (e.g. Rametsteiner and Simula 2003, Newsom and Hewitt 2005, WWF 2005, Newsom et al. 2006, Auld et al. 2008, Karmann and Smith 2009, Moore et al. 2012, Peña Claros et al. 2009). While useful, such studies are susceptible to several sorts of biases and oversights that our research helps clarify. For example, we document some of the improvements in forest management practices implemented as concessions moved towards certification but before their first official audit by a certifying body. These improvements are missed by evaluations based on CARs that necessarily commence only after certificates were granted.

Our study should facilitate the planned, on-the-ground assessments of certification impacts by providing some of the information needed to construct a theory of change for the certification intervention (Romero et al. 2013). For example, attribution of an observed change in management practices (e.g. protection of riparian buffer zones) to the certification intervention requires the ability to distinguish the impacts of governmental interventions with the same objective, an issue that we discuss in some detail. Our findings also reinforce the importance of what Romero and Castrén (2013) portray as a “certification continuum” of forest management units (FMUs) that can include concessions, privately owned forests, and communities. This continuum runs from those with no interest in or experience with certification to those that have remained certified for many years. Between these two ends of the continuum are FMUs that are on the verge of being certified and others that have lost their certificates due to deterioration of their management practices or to unwillingness (or inability) to pay the continuing costs of annual audits. During the three to 10 years the five concessions we studied were working towards FSC certification, they would be placed towards the middle of this continuum.

15.5.2 Certification costs and other barriers

Comparison of the financial costs of certification reported in this study with those available in the literature is complicated by differences in what costs were included and how data was collected. In contrast to most of the published studies, we divided the costs of certification into those that were direct and paid by the concessionaire or supplied by a donor and those that were indirect and mostly not assessed. Direct costs are for audits and forest management improvements required to comply with FSC standards, while indirect costs are foregone profits due to implementation of stricter environmental standards. In contrast, in many studies of certification the direct and indirect costs are not clearly differentiated or only audit fees are included as direct costs, which makes comparisons with the current study problematic. With this caveat registered, we note that all studies reported to date concluded that certification costs are substantial. Our estimates of the costs of certification for the five concessions in Kalimantan fall between USD 50 000 and USD 575 000 reported by Simula et al. (2004) and at the low end of the per-unit volume costs reported by Kollert and Lagan (2007)–USD 0.50/m³ to USD 2.50/m³ – and de Camino and Alfaro (1998) – USD 0.26 to 4.00/m³. As observed in Bolivia (Ebeling and Yasué 2009), certification costs in Indonesia generally declined with concession size due to size-independent fixed costs.

The high direct costs of certification, especially if expressed per concession, are at least partially due to the fact that much of the environmental and social monitoring and compliance checking was carried out by experts hired from national and international consulting companies. With daily rates of USD 250 to USD 650, the costs of hiring people to conduct biodiversity surveys and HC VF assessments mount up rapidly. These costs will decline when concession employees can conduct much of this work themselves, even though third-party verification will still be required. Training of local staff in the required disciplines should thus be a priority if certification is to thrive. Lack of trained staff is reportedly also a barrier to responsible forest management elsewhere in the tropics (e.g. Gullison 2003, Durst et al. 2006, Peña Claros et al. 2009).

A factor that promotes certification in Indonesia that is not reported elsewhere is related to forest industry structure, particularly with whether forest concessions are tightly linked to processing industries. Similarly, we expect that elsewhere in the tropics, as in Indonesia, governmental pressure and the availability of external financial support for certification are critical to the widespread adoption of certification (e.g. Bass et al. 2001, Durst et al. 2006, Ebeling and

Yasue 2009).

While barriers to certification in Indonesia such as unclear land tenure (e.g. Barr et al. 2006, Muhtaman and Prasetyo 2006, Ebeling and Yasue 2009) remain substantial, increased external support in the forms of funding and technical expertise, the government's new mandatory certification program, and international efforts for legality verification have all helped spur progress towards voluntary, third-party certification in the five Indonesian concessions studied. Synergies between these incentives, if realised, could encourage even poorly performing concessions to improve their management.

15.6 Conclusions

In the five case study concessions, independent third-party certification promoted improvements in forest management practices. Certification also required increased transparency and involvement of a wide group of stakeholders in forest management decision-making. The requirements for FSC certification in Indonesia far exceed those set by governmental regulations but also exceeded the technical capacities of concession staffs. To some extent, certifiers expect concessions to solve problems that can only be solved by the government. Most prominently, in the pursuit of certification, concessionaires cannot be expected to address the need for fundamental land tenure reform.

The financial costs of certification, though not yet fully known, are clearly substantial. While market incentives from certification fall well below expectations and national policies do not favour responsible forest management, firms seeking certification will likely continue to require financial and technical support from donors. On the positive side, if the obvious synergies between the GoI's new mandatory forest certification (PHPL) program and the FSC are captured, progress towards improved forest management and certification will be enhanced.

Understanding the motives for and barriers to certification is important to develop strategies to increase the success of this important conservation intervention. Vertically integrated forest companies are interested in certification because they recognise its potential market advantages and the strategic business opportunities it opens. Unfortunately, isolation of forest managers from market signals and benefits makes it challenging to ensure that any market benefits from certification return to the forest. This isolation also means that market incentives and disincentives (e.g. threatened boycotts) are apparently not the most important drivers towards FSC certification in Indonesia, at least not at the concession level. Slowing the uptake of responsible forest

management and certification in Indonesia are high costs, lack of incentives, unrealistic requirements and expectations, and perverse governmental regulations.

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Annex II 15.1 Government of Indonesia (GoI) and Ministry of Forestry (MoF) regulations related to natural production forest management and administration. Before 1983, forestry was in the Forestry Directorate (FD) under the Ministry of Agriculture.

Regulation	Subject	Main content
Undang-Undang (UU) 5/1967	Basic forestry law	Basis for GoI control over forests
UU 41/1999	Amends the forestry law	Supersedes UU 5/1967 to comply with decentralisation regulations
Peraturan Pemerintah (PP) 21/1970	Regulates forest concessions and forest product utilisation	Concessions should be formally linked with a forest-product processing industry
PP 6/1999	Modifies regulations about forest concessions and forest product utilisation	Supersedes PP 21/1970 Limits concessions to 50 000 ha per license with a maximum of 100 000 ha per province and 400 000 ha for single firms Provincial and district governments can grant concessions up to 10 000 ha and 100 ha, respectively Concessions do not need to be formally linked to forest-product processing industries
PP 34/2002	Regulates forest administration and the formulation of management plans	Amends PP 6/1999 Revokes authority of provincial and district governments to grant forest concessions
PP 31/1971	Regulates forest planning	Specifies how to prepare forest management plans
FD 35/Kpts/DD/1972	Indonesian selective logging rules (Tebang Pilih Indonesia, TPI)	Describes the silvicultural system for natural production forest
MoF Decree 485/Kpts/II/1989	Modification of TPI to include enrichment planting where needed	Modifications of the silvicultural system for natural production forest
MoF Decree P.11/Menhut-II/2009	Revision of TPI to include more intensive harvests and mandatory enrichment planting TPTI (SILIN)	Intensification of silvicultural management of natural production forest
PP 35/2002	Establishes a reforestation fund (Dana Reboisasi)	Payment of harvest volume-based reforestation fees
PP 51/1998	Sets royalties (Provisi Sumberdaya Hutan)	Payment of volume-based forest royalties
PP 27/1999	Requires environmental impact assessments (Analisis Mengenai Dampak Lingkungan)	Requires concessions to conduct environmental impact assessments and prepare environmental management and monitoring plans
UU 13/2002	Labor law	Regulates company-worker relationship (e.g. contracts, wages, and working hours)
P.38/Menhut-II/2009 Amended to P.11/Menhut-II/2011	Standards and guidelines for sustainable natural production forest management and timber legality verification	Employs independent auditors to assure compliance with forest management and administration regulations