



WWF

REPORT

INT

2015

Profitability and Sustainability in Responsible Forestry

Economic impacts of FSC certification
on forest operators

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Acknowledgements

The authors would like to thank the 11 forest management operations that provided detailed financial information for this research; and gratefully acknowledge the assistance of the WWF Global Forest & Trade Network (GFTN), including GFTN Managers Rui Barrera, Norbert Sonne, Joko Sarjito, Miguel Pacheco, Alexander Kostenko and Elyrice Alim for coordinating and facilitating meetings with the forest management organizations subject to this analysis. The data was gathered jointly by Form Valuations B.V. and WWF.

The study was made possible through financial support from Fondation Lombard Odier, the Swedish International Development Cooperation Agency (SIDA), WWF-UK and WWF-Switzerland. In addition, the authors would like to gratefully acknowledge the input of the reviewers in finalizing this report: Andrew Aulisi (Credit Suisse), Bruce Kahn (Sustainable Insight Capital Management), Adam Bloniarz (University of California Berkeley Department of Statistics), Thomas Ursem (Rabobank International), Rod Taylor (WWF), Margareta Renström (WWF), Chris Knight (WWF, seconded from PwC) and Huma Khan (WWF).

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Cover photo: Harvested logs from an FSC-certified forest, Solomon Islands,
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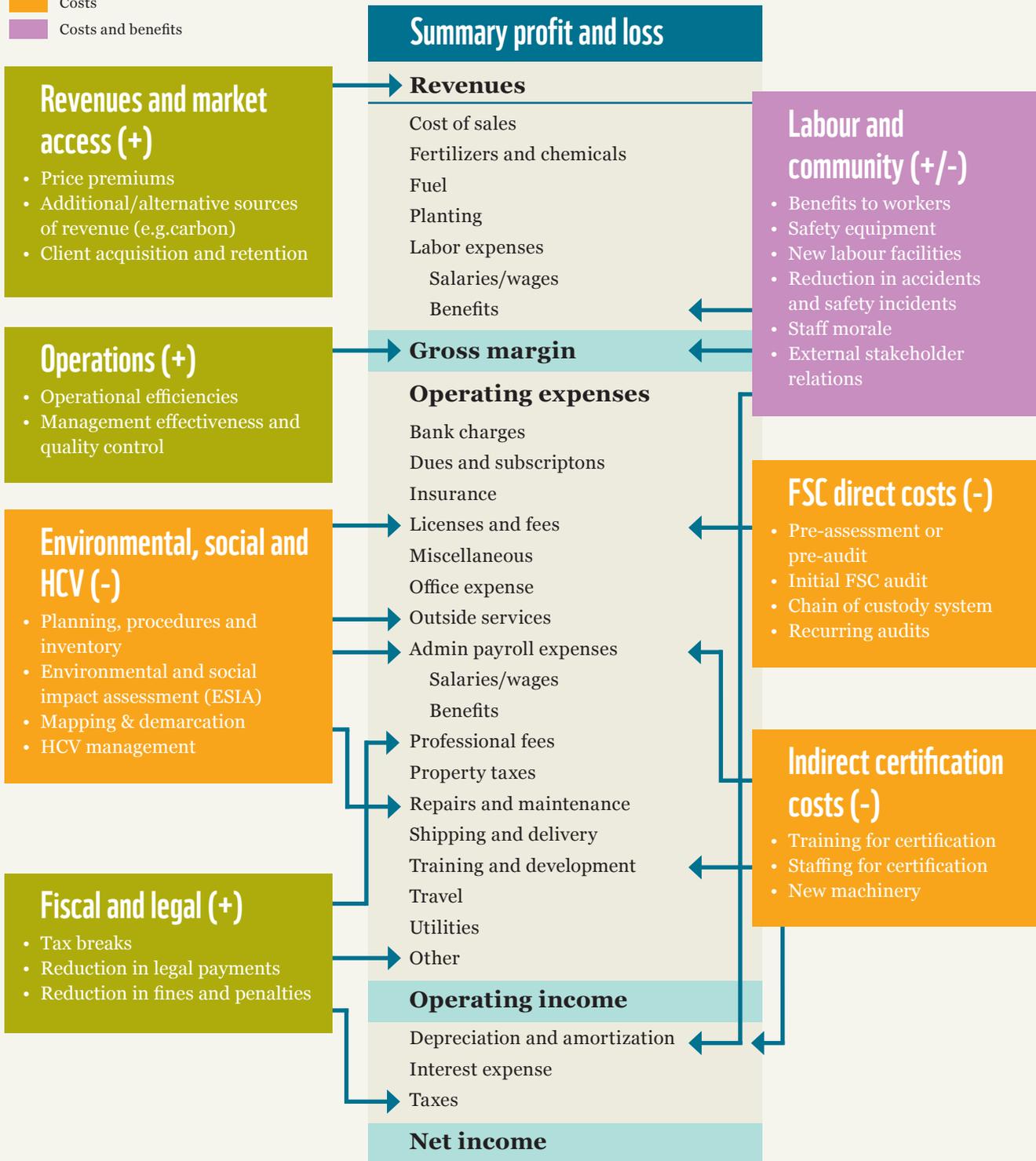
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Figure 1: Primary financial impacts of FSC certification on profit & loss

- Benefits
- Costs
- Costs and benefits



EXECUTIVE SUMMARY

The Forest Stewardship Council (FSC) currently certifies more than 180 million hectares across

80 countries. Previous research has demonstrated FSC's robust environmental and social benefits. Yet the economic impacts of FSC on forest operators are largely unknown; existing studies are fragmented and predominantly qualitative.

This study seeks to advance knowledge about the impact of FSC certification on a company's "bottom line" through primary research on 11 forestry entities operating across four continents. More than 500 original data points are analysed to assess upfront investments, annual costs, annual benefits, and the overall net present value (NPV) of the decision to pursue FSC certification.

The research can aid forest operators, as well as their financiers and donors, analyze individual projects, thereby facilitating more efficient allocation of resources. The participating companies represent a range of sizes, geographies, and sub-sectors. This research should help to establish a baseline, a common methodology, and indicative results from a small yet diverse sample.

For the forest operations evaluated, the financial benefits of FSC tend to outweigh the costs, albeit with high company-by-company variance, and special consideration required for high conservation value (HCV) set-asides and intangible benefits. On average, the companies earned an extra US\$1.80 for every cubic metre of FSC-certified roundwood or equivalent, over and above any new costs, due to price premiums, increased efficiency, and other financial incentives. The business case was strongest for tropical forest operations and small/medium producers (regardless of geography) who experienced significant financial gains, while temperate and large producers experienced small losses. It took the companies, on average, six years to break even on their FSC investment.



ON AVERAGE, THE COMPANIES EXAMINED EARNED AN EXTRA US\$1.80 FOR EVERY CUBIC METRE OF FSC-CERTIFIED ROUNDWOOD OR EQUIVALENT, OVER AND ABOVE NEW COSTS, THROUGH PRICE PREMIUMS, INCREASED EFFICIENCY, AND OTHER FINANCIAL INCENTIVES RESULTS VARIED BY OPERATION AND GEOGRAPHY



Logging company employee measuring felled wood, East province, Cameroon.

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INTRODUCTION

Wood is one of the world's most versatile natural materials, with desirable properties for construction, packaging and consumer product materials, as well as renewable energy. The world currently consumes 3.4 billion m³ of wood-based products each year. Demand is projected to reach 7.2 billion m³ by 2030.¹

BETWEEN 1990 AND 2010, MORE THAN 50 MILLION HECTARES OF PRODUCTION FORESTS WERE REALLOCATED TO OTHER PURPOSES

Just as global demand for wood-based products is soaring, a significant portion of the production base faces dwindling productivity and increasing land-use competition. Even though plantations are expanding and there is an increasing proportion of total supply coming from them, the gap between demand and supply is considerable and expected to grow. Developing and emerging economies currently account for more than half of global roundwood production.² But in many of these countries illegal logging, low industry standards and weak regulatory oversight, combined with expanding agricultural production, have seriously undermined the sustainability of the forest sector.

Forest degradation depletes the timber yields and ecosystem services forests provide, which leaves them vulnerable to human and natural disturbances, and often eventually leads to deforestation. Forest degradation also threatens the economic viability of forest operations by lowering the regenerative capacity of standing forests. As the quality of forest resources decreases, forestry operations become less competitive compared to other forms of land use, and agriculture and livestock soon take over. Between 1990 and 2010, more than 50 million hectares of production forests were reallocated to other purposes.³

In addition to ecological and economic concerns, the forest sector is also facing increasing regulatory and reputational risk. Major consumer markets such as the US, the EU and Australia have enacted legislation requiring companies to ensure their products do not contain illegally sourced wood. Tighter regulations, combined with high-profile international civil society campaigns against illegal and destructive logging, have significantly elevated the importance of regulatory and reputational risk management in the forest sector.

In this context, FSC certification can serve as an important tool for forest managers to mitigate environmental, social and regulatory risks, while gaining market advantages such as brand recognition, price premiums and market access (see Box 1.) However, the economic viability of forest certification remains poorly understood.

In recent years, research into other soft commodity sectors – such as palm oil and soy – has demonstrated the benefits of sustainability certification schemes, including reduced operating costs, better employee and community relations, and reduced cost of capital.⁴ While there exists a body of literature assessing the costs and benefits of FSC certification for forest operators, it focuses on a) individual operators as opposed to cross-cutting analyses; and b) the direct cost of compliance (e.g. audit costs) and direct benefits received through market premiums. Little is known about the operational and intangible benefits (and costs) of FSC, as well as the average financial impacts and variance across forestry companies, such as temperate versus tropical.

This report attempts to contribute to filling that gap by assessing the economic impacts of FSC certification on a range of forest operators, as compared to a typical company's current practice. It takes a novel approach to synthesizing a wide range of quantitative and qualitative data acquired through extensive field and desk research, including primary research on 11 certified entities across four continents. The report also provides tools, methodology, and baseline data that can aid both commercial and small-scale forest operators – as well as their financiers and donors – in analyzing individual projects. Moreover, it provides recommendations for policymakers and wood-based product buyers interested in improving the economic viability of forests and forestry.

It should be noted that the entities participated in this research represent a range of sizes, geographies, and sub-sectors. High variance was observed for certain indicators in relation to these characteristics. Therefore, strict comparisons between and within the groups must be exercised with caution. Moreover, the results of this assessment should not be extrapolated to explain the forest sector as a whole for any given country or region.



**THE AMOUNT OF
WOOD WE TAKE
FROM FORESTS AND
PLANTATIONS EACH
YEAR MAY NEED TO
TRIPLE BY 2050**

Sustainable wood extraction as a forest conservation strategy

The amount of wood we take from forests and plantations each year may need to triple by 2050, according to the **Living Forests Model**. Can we produce more wood without destroying or degrading forests, in a world where competition for land and water is increasing?

Forest stewardship, motivated by a commercial interest in maintaining supply, can help protect vulnerable forests from illegal logging, encroachment or conversion to farmland. The market for responsibly harvested wood products can motivate good forest stewardship that safeguards critical resources and protects forest values.

FSC principles provide a useful benchmark to assess the sustainability of production forestry. FSC certification also enables forest managers to gain market edge by differentiating sustainably harvested products from competitors, while giving buyers of wood products assurances that the wood was legally harvested and originated from a well-managed forest. Voluntary certification also has the ability to generally raise forest management standards by highlighting outdated forestry practices and improve forest governance in places where legal enforcement is weak.

The key challenge for the wood products industry is to supply more wood products with less impact on forests. Responsible forest management and plantations, verified by credible certification standard, can help enable the forest sector to contribute positively to the planet and people.

Box 1. An overview of FSC certification

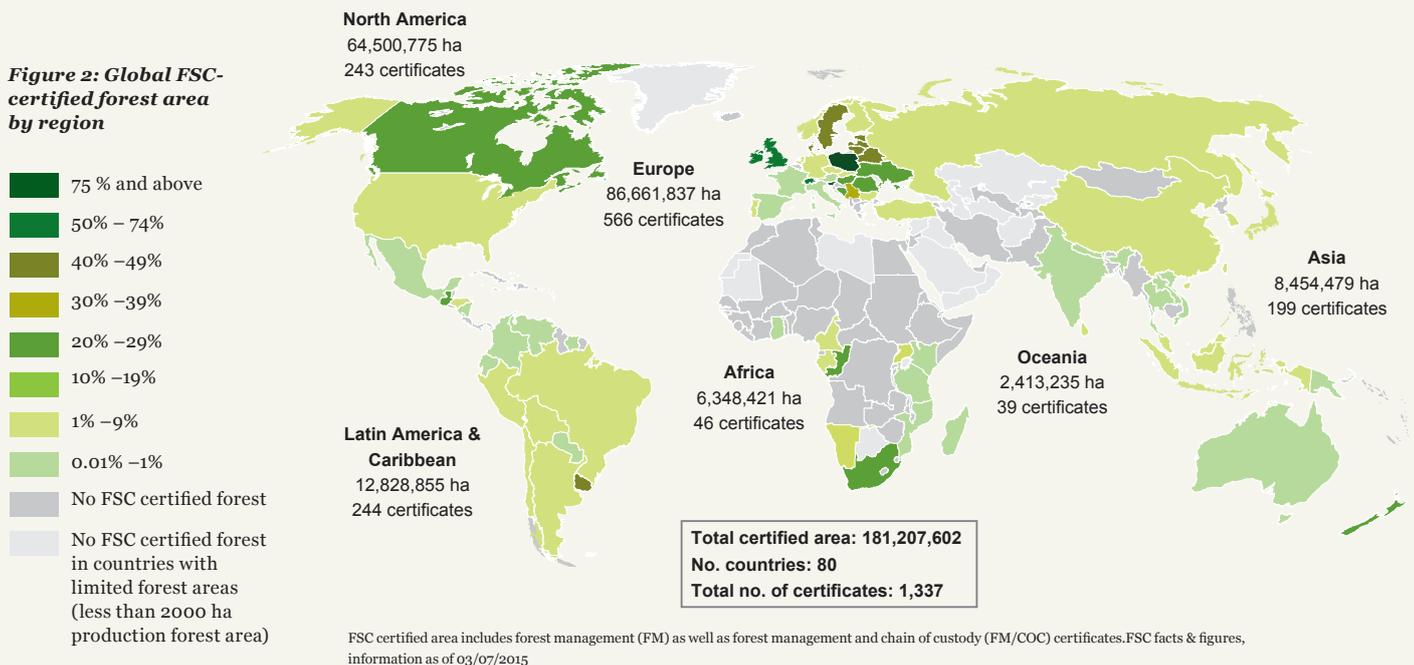
FSC certification was one of the earliest multi-stakeholder, global commodity eco-certification schemes, establishing the model for today’s expansive certification landscape. FSC emerged in the aftermath of the 1992 Earth Summit in Rio de Janeiro, where world leaders failed to produce legally binding commitments on forest management. Supported by a large number of environmental organizations (including WWF), community leaders and timber buyers, FSC was established as a democratic, inclusive and independent certification scheme promoting responsible forest management.

Since its inception in 1994, FSC certification has grown steadily. It now stretches across 79 countries covering over 180 million hectares of forests worldwide. FSC is considered an important conservation instrument for industry and civil society, a reference point for procurement and investment decision-making, and a model for credible standard-setting for a wide range of other commodities. About 15% of global roundwood supply in the timber and pulp and paper sectors is FSC-certified.*

WWF considers FSC to be the most credible forest certification standard, because it incorporates the strongest environmental and social safeguards, as well as balanced governance and membership. Compared to other forest certification standards, FSC has the most rigorous requirements for safeguarding HCVs, chemical use, community benefits, indigenous rights, stakeholder engagement and transparency. It also contains the most diverse membership, comprised of leading national and international environmental and social organizations, indigenous peoples’ organizations, community forestry enterprises, forest industry professionals and corporations. FSC is an international membership association, governed by its members who are divided into three chambers – environmental, social and economic. Each chamber holds a third of the weight in votes. This guarantees that influence is shared equitably between different interest groups.

* FSC market penetration data estimated by WWF based on FAO/UNECE Forest Products Annual Market Review 2012-2013 report and FSC reports.

Figure 2: Global FSC-certified forest area by region



LITERATURE REVIEW

Although existing literature on the costs and benefits of FSC certification has produced a variety of assessments and conclusions, the field has been constrained by limited availability of primary data.

Most studies have therefore collected data from audit reports and donor budgets (in cases where projects are externally funded), or surveyed company and community representatives regarding their experiences of forestry certification. The majority of the research has been conducted in North and South America, with more recent efforts in Indonesia and Cameroon. The outputs typically deal with the pros and cons of certification in general terms. There are only a few studies where actual financial data is obtained and analysed.

Despite the lack of financial data and the wide variation in methods, owing to the sheer number of individual studies on FSC over the past 25 years – 29 were analysed for this review – we can glean valuable insights.

1. Main findings – costs

The direct costs of FSC certification – audit costs and the costs of third-party services associated with obtaining and maintaining the certificates – have been relatively well documented. There are also a large number of qualitative accounts of the indirect costs, such as staff time spent on training, planning and data management.

The initial investment associated with obtaining FSC certification and recurring certification-related costs are studied most frequently. However, most of the studies provide only a lump sum figure without specifying the cost breakdown or cost drivers, and results vary widely. Early research in the US found the costs ranged from less than US\$2.50 to nearly US\$25 per hectare.⁵ A recent report in Indonesia concludes that the average start-up cost of certification among five concessions was US\$4.76 per hectare, including financial aid from external agencies.⁶ A study in Argentina and Brazil found total start-up costs ranging from US\$50,000 for smaller operations to US\$150,000 for larger ones.^{7,8}

Data on recurring certification costs are even more difficult to compare because of the varying calculation methods and perceptions of which costs are associated with certification. Surveys of forestry companies from the US, Canada, Brazil, Argentina and Chile showed that the median total costs of certification were US\$6.45-US\$39.31 per hectare for smaller tracts (< 4,000 ha), and US\$0.07-US\$0.49 per hectare for tracts of 400,000 ha or more.⁹ Other research in the forests of Santa Cruz, Bolivia, estimated the average cost of certification at US\$0.18 per hectare per year.¹⁰

Some research also discusses potential **opportunity costs** incurred due to compliance with FSC standards – the income that operators could have earned by using their forests under different management schemes. For some private and community landowners, the opportunity cost may be the foregone income from agricultural production, alternative economic activities,¹¹ or simply by logging more intensively.¹² Yet these discussions lack quantification or clear counterfactuals.

2. Main findings – benefits

Most of the existing research acknowledges that FSC certification has brought a multitude of benefits to companies and communities. However, these claims are neither fully quantified nor given proper context for analysis, and the literature often generates conflicting evidence.

Price premiums and increased sales are among the most commonly identified benefits of FSC, ranging widely from 20–50% for some tropical native species in Brazil¹³ to 5–51% for community forest products in Bolivia.¹⁴ Similarly, some authors claim that FSC certification has resulted in increased sales.^{15, 16, 17} These results contradict other studies where no price premiums or sales increases were found.^{18, 19, 20, 21} Because of the differences in methods used, it is not possible to compare across studies. However a general conclusion is that higher premiums and increase in sales are reported by community and small-scale producers and for certain tropical species.

Greater market access is another common motivation for forest enterprises to pursue FSC. FSC certification has reportedly improved access to European markets for producers in the tropics.^{22, 23, 24} For small community-based forest operators, access to ethical market segments in Europe appears to be one of the most concrete benefits of FSC certification.²⁵ Yet in other cases, companies claim that they do not actually gain access to these markets.^{26, 27}

Additionally, FSC certification offers incentives to **improve operational efficiencies** and **management practices**. FSC requires operators to develop management plans and install modern inventory management, tracking, and accounting systems. It has been reported that these requirements help reduce waste, improve management effectiveness, increase transparency, and eliminate other hidden costs.²⁸ This efficiency gain was well documented in community forestry settings.^{29, 30} Another study indicated that workers were thoroughly **trained in best practices** under FSC, including logging techniques, data management, and safety measures³¹; and therefore are theoretically more productive. Yet there is no information in the existing literature on long-term cost savings resulting from improved management practice and productivity.

For both large and small producers the biggest intangible benefits of FSC are **improved public image** and **stakeholder relations**.^{32, 33, 34, 35, 36, 37, 38} Although it is not feasible to fully quantify the benefits of improved public image, anecdotal evidence shows that FSC facilitates dialogue among stakeholder groups, thereby reducing uncertainty in doing business.³⁹ Other producers see FSC as a ‘badge of honour,’ which creates opportunities to secure public funding support and to win the trust of business clients and local communities.^{40, 41} With improved stakeholder relations, FSC certification also brings in **external funding and technical support** to community producers committed to responsible forest management.^{42, 43}

For community forest operators and indigenous groups living in and around forest concessions, FSC certification often serves as an **instrument to resolve land tenure issues and secure resource access rights, as well as increase political and economic bargaining power**.^{44, 45} In a collection of case studies on forest certification in emerging markets, researchers from Southeast Asia to Eastern Europe to Latin America generally agreed that FSC has had significant ramifications on local power balances between logging companies and communities, as well as between communities and policymakers.⁴⁶ A recent study in the Congo

Basin confirmed that FSC-certified companies have significant positive impacts on the wellbeing of surrounding communities, compared to those companies pursuing business-as-usual practices.⁴⁷

Finally, some companies consider the **assurance of a more sustainable resource base over the long term** as an important benefit of FSC. Certification encourages herbicide and chemical reductions, biological inventory, control over exotic species, and proper waste management.⁴⁸ An extensive economic analysis of two adjacent forest management units (FMUs) in Sabah, Malaysia – one FSC-certified since 1997, the other practising unsustainable logging – found that the volume of large high-value commercial trees and asset value per hectare in the FSC-certified FMU were twice as high as in the neighbouring non-certified FMU.⁴⁹

3. Research gaps and discussion

The largest gap in the current literature base concerns empirical data on the actual dollar-value costs and benefits of certification. In addition, cross-company quantitative analyses are needed to compare forestry companies of varying climate zones, sizes, and forest management types.

In the following section, we present the findings from in-depth field-based research on 11 forestry entities worldwide. The analysis helps fill in many, but not all, of the gaps identified above. It takes the discussion on the costs and benefits of certification beyond theory and perceptions and provides concrete data and cross-company analysis.



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A man from the indigenous Baka group working at a sawmill in Cameroon. Research shows that for indigenous groups living in and around forest concessions, FSC certification often serves as an instrument to resolve land tenure issues and secure resource access rights.

Case study 1 Market access

Company A is a mid-sized operator managing 15,000 hectares of certified boreal forest. The company's experience shows the value of FSC as a brand differentiation tool for forestry producers in a competitive commodity marketplace.

The problem

Initially, Company A was reluctant to pursue FSC certification. Company A was a relatively small enterprise and at that time was mostly supplying timber products to the domestic market. Given the perceived high cost of FSC certification and the lack of domestic market demand for FSC-certified products, the company management had serious doubts about whether FSC certification could bring any direct benefits.

However, it was clear that in an increasingly competitive market, buyers were looking more for products with higher standards and distinctive features, and FSC certification was a feature that could help Company A stand out from the crowd. Finally the decision was made and Company A, in collaboration with WWF, started the process of preparation for FSC certification in 2007.

Company A received its FSC certification in 2008. However, at this time the global economy was in the midst of a financial crisis that plunged the demand for timber in US and EU markets.

The solution

Despite the adverse market conditions, Company A actually managed to grow its business during the recession. One of the main results of the certification was that Company A became a plywood supplier for IKEA, the Sweden-based global furniture retailer and a major buyer of timber and paper products worldwide. IKEA's commitment to responsible sourcing, including sourcing FSC-certified wood, exemplifies a growing sustainability trend within the leader segment of the retail sector. By breaking into this market segment, Company A was able to not only diversify its client base, but also to strengthen its position and image in the domestic market.

Another big win came when the organizing committee of one of the largest international sporting events decided to use FSC-certified timber in construction of a range of infrastructure projects. Company A managed to win the tender as a timber supplier. This was a major achievement for a local small-scale enterprise. According to a Company A representative: "High quality timber products and the presence of the FSC certificate were major advantages which contributed to this success."

Although FSC does not guarantee market access, the company now sees it as a necessary investment to stay competitive in current and future markets, and it renewed its FSC certificate in 2013.

COSTS AND BENEFITS OF FSC

1. Business environment

A total of 11 entities – 9 FSC-certified companies and 2 associations with group FSC certificates – from 7 countries were recruited for this study through their participation in the Global Forest & Trade Network (GFTN), a WWF platform that promotes responsible forestry and trade in forest products. Organizations participating in GFTN have made public commitments, and demonstrated progress, toward responsible forest management. They therefore constitute an ideal sample for research.

Figure 3: Geographical distribution of research participants



With two exceptions, all companies in the study sample have certified 100% of their forest resources. The breakdown of the participating companies by climate, size, and forest type is as follows:

Table 1: Number of companies in each subgroup

	Climate zone		Company size		Forest management type	
	Tropical	Boreal & temperate	Small-medium (< US\$5 million annual turnover)	Large (> US\$5 million annual turnover)	Natural forest	Plantation
Number of participants	6	5	5	6	8	3
Country of operation	Cameroon Colombia Indonesia Malaysia Peru	Russia Portugal	Malaysia Russia Portugal Peru	Cameroon Colombia Indonesia Malaysia Russia	Cameroon Indonesia Malaysia Peru Russia	Colombia Russia Portugal

A TOTAL OF 11 ENTITIES — 9 FSC-CERTIFIED COMPANIES AND 2 ASSOCIATIONS WITH GROUP FSC CERTIFICATES — FROM 7 COUNTRIES TOOK PART IN THIS STUDY

With the exception of Portugal, all of the companies participating in this research are based in developing and emerging economies. These companies face an array of political, regulatory and social obstacles that affect the costs and benefits of obtaining and maintaining FSC certification. While each company's circumstance is unique, many share similar challenges as discussed below.

Lack of clarity in land tenure: In most countries in our sample, the state owns forest land and issues use rights to companies and communities. Although local communities and indigenous peoples are not supposed to be negatively impacted by concessions, concession permits and allocations are often issued without free, prior and informed consent of forest communities or proper land-use planning. Local consultations take place in the process of management plan preparation and formal forest management unit gazettelement.⁵⁰ In places where land tenure rights are contested, community consultation and social impact assessment and mitigation impose high costs on the companies pursuing FSC certification. Poor land-use planning also results in overlapping use rights between forest concessions and agriculture and mining.⁵¹ Conflicts over land use often take a long time to resolve, adding to the cost of obtaining certification.

Policy and legislative barriers: Inconsistent policies between and within the agencies governing forestry are common. Different government agencies with conflicting policy objectives (e.g. maximum income vs. sustainable use of resources) create confusion among forest companies trying to navigate through the legal requirements.⁵² In some cases, the lack of consistency and coordination between national, provincial and local governments also makes it difficult for companies to obtain necessary permits. Bureaucratic hurdles are another major issue. Extensive paperwork, inspections and approval processes discourage legitimate forest operations and good forest management practices.⁵³

Weak law enforcement and corruption: Even in cases where laws are adequate on paper, companies face additional challenges from weak enforcement. Government officials in developing and emerging economies have limited resources (and incentives) to enforce minimum forest management standards. As a result, the gap between 'business-as-usual' and certification standards is vast, making it costly for companies to achieve certification and subsequently compete.⁵⁴ Corruption and extortion also have a serious impact on the forest sector. Concessionaires have to make many types of official and unofficial payments to government, from crossing checkpoints to getting various approvals and inspections carried out.⁵⁵

Illegal logging: Illegal logging goes hand-in-hand with weak law enforcement. The problem is widespread across the tropics and Russia – in some cases as much as 75-80% of total wood removal is estimated to be illegal.⁵⁶ Illegal logging not only undermines legitimate forest operations by driving down the market price, but also erodes the timber resources and raises the cost of monitoring and patrol for FSC certificate holders.

Environmental issues: Companies operating in biologically diverse and sensitive regions, such as those participating in this study, need to put in place HCV forest management (see Box 2) and wildlife conservation measures as per the FSC standard. However, assessing and managing HCVs and curbing wildlife poaching within forest management units – especially where there is weak surrounding legal enforcement – requires substantial expertise, resources, and effort.⁵⁷

In sum, the 11 entities covered by this research all face high barriers to certification due to the lack of enabling policy conditions in their respective countries. These factors must be taken into consideration as we explore the costs and benefits they have experienced.

2. Overview of research participants

The median duration of holding certification among the research participants was six years. The average time required for companies to achieve FSC certification, after the initial decision to pursue it, was three years. By focusing on companies and smallholders who have demonstrated long-term commitments to responsible forest management and production, and examining their finances before and after, the study was able to tease out the incremental value of FSC.

Among the participating organizations, the study found that:

- **It took nearly two-and-a-half times as long for companies in the tropics to become certified as those in temperate and boreal regions (3.8 years vs. 1.6 years).**
- **It took approximately twice as long for companies managing natural forests to become certified compared to those managing plantations (3.3 years vs. 1.7 years).**
- **There was no difference between small/medium producers and larger companies in terms of years needed to become certified.**

Assuming that time spent on preparing for FSC certification reflects the amount of effort required for the producers to make necessary changes in their operations, these findings concur with earlier research that it is more difficult for producers in the tropics and those managing natural forests to pursue FSC certification. As discussed in the previous section, this is largely due to the unfavorable business environment that the tropical producers face, as well as the low baseline of forest management practice in the tropics. However, as discussed in the rest of this section, many of these parties also tend to reap higher financial rewards.

Contrary to earlier literature, this study did not find price premiums to be the primary motivation for companies to pursue FSC certification. Rather, FSC's main attraction was found to be the competitive advantages it offers in terms of accessing key buyer markets and brand differentiation. In single cases price premium, corporate values, and improvement of management were also mentioned by the research participants.

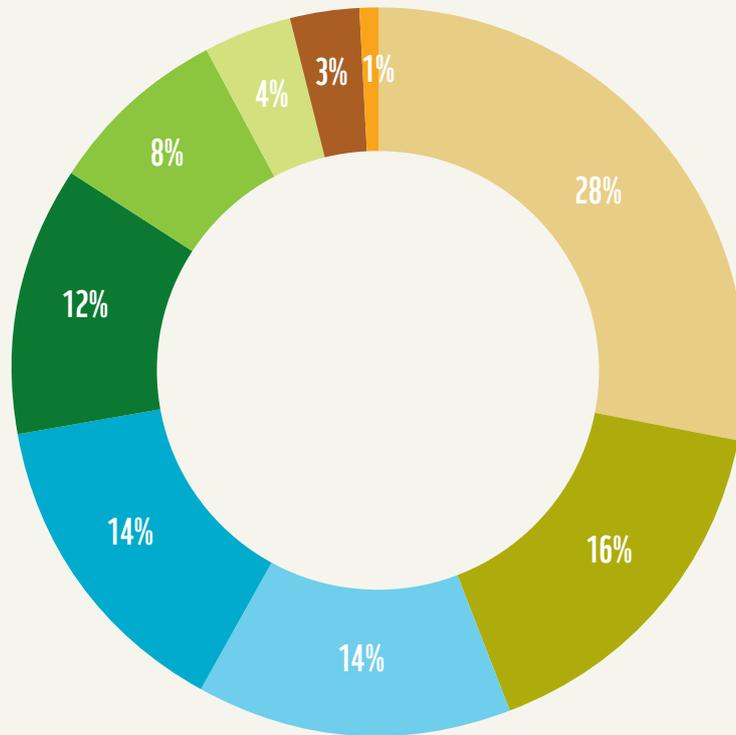
3. Certification costs

Pre-certification costs

Among the nine participants from whom data was available, **the average total cost associated with obtaining FSC certification was US\$3.74 per m³ of certified roundwood equivalent production, or US\$2.01 per hectare of certified forest.**

Graph 1: Total costs associated with obtaining FSC certification per m³ of certified production

Pre-certification costs
US\$3.74 per m³



As shown in Graph 1, the main costs were:

1. Planning, procedures and inventory – 28%
2. Initial FSC audit – 16%
3. Pre-assessment or pre-audit – 14%
4. Environmental and social impact assessment (ESIA) – 14%
5. Safety equipment – 12%

The majority of the costs for obtaining FSC were indirect – i.e. embedded within business operations. Of these indirect costs, the largest was the investment that companies have to make to **develop and adjust management plans, procedures and forest inventories as per FSC requirements**, followed by **environmental and social impact assessments (ESIAs)**.

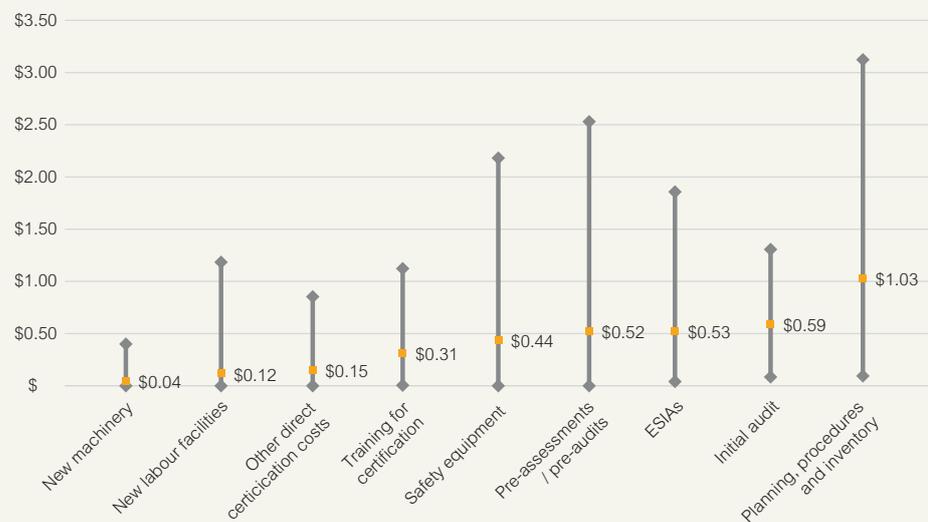
Overall, **15% of pre-certification costs were invested in improving workers’ well-being**, including investment in safety equipment and labour facilities. This high level of social spending is partially explained by the minimal social security and labour laws in many developing countries. This cost would likely be considerably lower in countries with more progressive social security and labour legislation and enforcement.

Although indirect cost plays a big role in companies’ overall investment in FSC certification, it is often difficult for them to estimate, and it varies widely from company to company. For example, the average cost for planning, procedures, and inventory was approximately US\$1 per m³ of certified production, yet individual responses ranged from less than US\$0.10 to over US\$3 per m³. A similar variation can be observed across other indirect cost indicators.

The initial FSC audit and the pre-assessment/pre-audit together accounted for 30% of total pre-certification costs. Different companies deployed different approaches on this front. Some invested in pre-audits to make sure they had met FSC requirements before applying for an official FSC audit, while others did not choose to incur any pre-audit cost. These costs are typically considered a direct cost of FSC certification.

Graph 2 shows the average, maximum, and minimum cost per m³ for each pre-certification cost category. Orange dots represent the average value while vertical bars indicate the ranges.

Graph 2: Average and range of pre-certification costs per m³ of certified production



Pre-certification cost drivers

The primary drivers for the variance in pre-certification costs were geography and forest management types. Across different cost categories, companies in the tropics experienced much higher unit cost compared to those in other climate zones. To a lesser extent, managing natural forests was also associated with higher certification costs than managing plantations. The underlying causes of the observed differences may be that companies in the tropics and those managing natural forests tend to face greater challenges in managing environmental and social issues. The complexity and diversity of tropical forests raises the cost for forest management planning. The presence of indigenous peoples and unclear tenures in the tropics make it more costly to implement impact mitigation measures. Moreover, ES/As are typically not mandatory or are poorly enforced in the countries covered by this research, hence natural forest managers and operators in the tropics have to invest more than the other geographies or forest types.

Though the data was limited, the study found a positive correlation between pre-certification costs and time needed to become certified – i.e. both were highest among tropical and natural forest managers. The authors hypothesize that the time needed to become certified is likely affected by the quality of governance and local capacity. More data points and further analysis are needed to validate this association.

In the samples studied, small/medium producers incurred smaller pre-certification costs than large companies. This may partly be due to the fact that the majority of small producers in the sample were located in the northern hemisphere and do

Table 2: Pre-certification costs per m³ of certified production for each subgroup

Climate zone	
Tropical	US\$4.95
Boreal & temperate	US\$2.83
Company size	
Small/medium (< US\$5 million turnover)	US\$2.48
Large (> \$US5 million turnover)	US\$4.76
Forest type	
Natural forest	US\$4.01
Plantations	US\$2.73

not face the same obstacles as those in the tropics. Yet the data also showed that small/medium producers spent almost five times as much on training per unit of production than larger counterparts. Table 2 summarizes the pre-certification cost per m³ of certified wood production for each subgroup:

Post-certification annual costs

For the 11 participants, **the average total annual cost associated with maintaining FSC certification was US\$3.71 per m³ of certified roundwood equivalent, or US\$4.16 per hectare of certified forest.**

As shown in Graph 3, the main costs were:

1. ESIA's, monitoring, mitigation – 37%
2. Benefits to workers – 20%
3. Recurring audits – 11%
4. Planning, procedures, and inventory – 7%
5. Staffing for certification – 7%

Graph 3: Total costs associated with maintaining FSC certification per m³ of certified production

Post-certification costs
US\$3.71 per m³



Environmental and social impact monitoring and mitigation activities accounted for the largest share of the post-certification cost, which averaged approximately US\$1.36 per m³ of certified production per year. Within this category, the majority of the spending (approximately US\$1.12) went to impact mitigation activities such as road, bridge, and landing site construction, erosion control, and reforestation, as well as increased compensation to communities living in and near concessions. Other costs within this category included monitoring and post-certification ESIA. Combined with HCV management, **the total investment in environmental and social stewardship accounts for over 40% of the total annual cost of FSC certification.**

In terms of labour cost, there was **no clear indication of an increase in salaries to workers. Yet companies increased spending on worker benefits substantially in the form of bonuses, health care, and other social support, accounting for 20% of total post-certification spending.** One company increased investments in worker housing, water quality, and availability of schools and health care services. Another company set up a special fund to offer interest-free loans for its employees, provided special payments to pensioners, and supported employees' children to go to summer camps. Although the FSC standard does not mandate forest managers to make specific types of social investments, certification does require companies to “maintain or enhance the long-term social and economic well-being of forest workers and local communities.”⁵⁸ The companies participating in this study all reported that they made the investment decisions through stakeholder consultation in accordance with FSC Principles and Criteria.

Approximately **14% of post-certification costs were spent on changes in companies' operations, such as planning, procedures and inventory, as well as staffing for certification.** Prior to obtaining FSC certification, forest managers – particularly those managing natural forests in the tropics – often did not have effective plans, systems, or even information regarding their logging operations. The installation of annual planning, data management systems, administrative procedures and accompanying management personnel costs companies approximately US\$0.50 per m³ of certified production per year.

Recurring audits were the only major direct costs associated with post-certification. The average cost was US\$0.42 per m³ of certified production per year. The analysis found that natural forest operators paid substantially more for annual audits than their silvicultural counterparts.

Unlike the data for pre-certification costs, the post-certification cost data showed relatively small variance except in one category: environmental/social impact monitoring and mitigation. Graph 4 shows the average, maximum, and minimum costs per m³ for each post-certification cost category. The orange dots represent the average value and the vertical bars indicate the ranges.

Graph 4: Average and range of post-certification costs per m³ of certified production



Post-certification cost drivers

The environmental/social impact monitoring and mitigation activities accounted for the largest share of the total cost and also showed the largest variance across different cost categories. Here the authors found that large companies invest more in this category per unit of production than small and medium producers. Again, though the sample size is limited, the analysis indicates that companies that implement active environmental and social impact mitigation activities, such as restoration and community engagement, have larger expenditure in this category than those that implement passive management, such as simply setting aside a portion of the forest for protection.

Table 3 summarizes the annual post-certification cost per m³ of certified production for each subgroup.

Table 3: Post-certification costs per m³ of certified production for each subgroup

Climate zone	
Tropical	US\$3.47
Boreal & temperate	US\$4.07
Company size	
Small/medium (< US\$5 million turnover)	US\$3.71
Large (> US\$5 million turnover)	US\$3.73
Forest type	
Natural forest	US\$3.90
Plantations	US\$3.33

Box 2. Estimating HCV management opportunity costs associated with FSC standard compliance

There are six categories of high conservation values including forest areas that contain significant biodiversity values; sustain threatened or endangered ecosystems; provide critical ecosystem services; and are essential for local communities to meet basic needs and maintain cultural identities.

The data gathered from the 11 certified entities showed the direct costs associated with the identification, management and monitoring of these areas. In almost all cases the companies have set aside some productive areas in their FMUs for the purpose of HCV protection.

Opportunity cost is defined as the value of the best alternative forgone, when a choice needs to be made between mutually exclusive alternatives given limited resources. Since the companies studied took areas out of production to meet the FSC standard, there is also a resulting opportunity cost equivalent to the loss of potential income from those areas. These opportunity costs were not readily available in the gathered data because companies did not maintain consistent baselines against which they could be assessed, so a modelling exercise was performed to estimate them on a case-by-case basis. These results must merely be seen as indicative and may vary considerably from the actual experience of a specific company.

Methodology

The ratio between production area and HCV set-asides was calculated and applied to each company's operating margin to estimate the reduction in operating profit that these companies hypothetically would have incurred as a result of setting aside productive areas. In order not to overestimate the opportunity costs two precautionary measures were taken:

1. Companies often choose to set aside areas with less, little or no productive value. Thus, the opportunity cost estimates were reduced by 40%. Some specific reasons why HCV areas may be less productive and/or less costly to set aside include:
 - Areas may be unsuitable for production due to rocky/steep terrain or unsuitable without costly measures (e.g. draining wetland);
 - Areas may be required to be set aside anyway (e.g. riparian zones to comply with legislation/forest codes);
 - Areas may be more costly to manage due to initial costs for infrastructure (e.g. larger HCV areas/intact forest landscapes).
2. Many HCV areas remain productive or partially productive. Under this assumption, opportunity cost figures were reduced by an additional 70%.

Table 4: Opportunity costs per m³ of certified production by company

Case	Type	US\$/m ³
1	Tropical	0.17
2	Temperate	0.01
3	Temperate	0.38
4*	Tropical	-
5*	Tropical	-
6	Tropical	2.60
7	Tropical	0.14
8	Tropical	0.04
9	Temperate	1.26
10	Boreal	0.05
11	Boreal	0.08

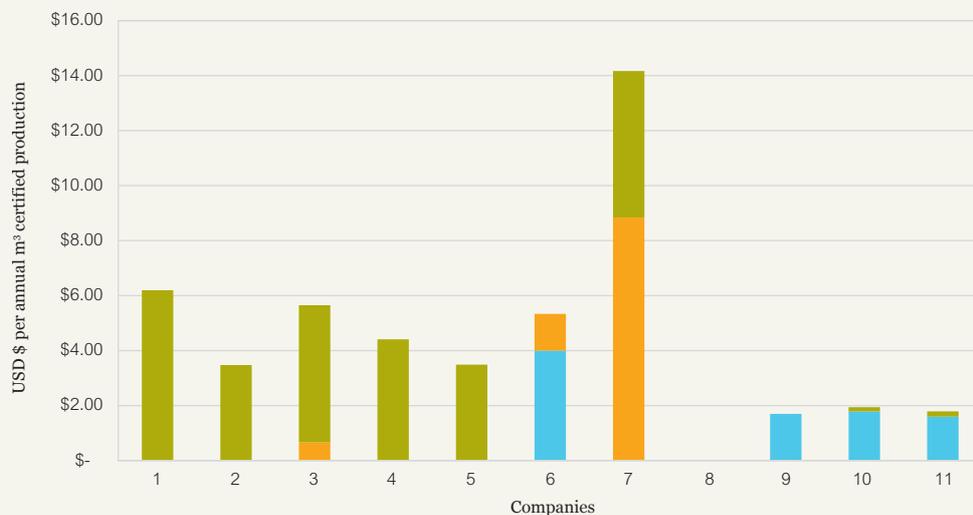
* The opportunity costs for case 4 and case 5 were not estimated due to lack of key data points.

4. Certification benefits

Quantifiable benefits

The total financial benefit accrued by the 11 research participants was on average US\$6.03 per m³ of certified production. However, the total and its underlying components varied widely between companies, as is shown in Graph 5. Price premiums emerged as the largest benefit, followed by improvements in operational efficiency. Several companies reported significant add-on benefits from FSC, including reductions in their tax rate, government payments, government subsidy programmes, and external donor funding.

Graph 5: Total financial benefits of FSC certification, by company



Price premiums: Of the 11 companies studied, eight recorded price premiums for their certified wood. Most premiums were small, with an average price premium of US\$2.57 per m³ of certified production, or 2% of annual turnover of certified products. Most of the companies interviewed claimed that the level of premiums received did not cover the cost of FSC. However, it should be noted that in at least two cases, the companies sold FSC-certified raw materials to affiliated primary processing companies at regulated/fixed prices, rather than in the open market. Overall, price premiums represented 42% of the total financial benefits of FSC.

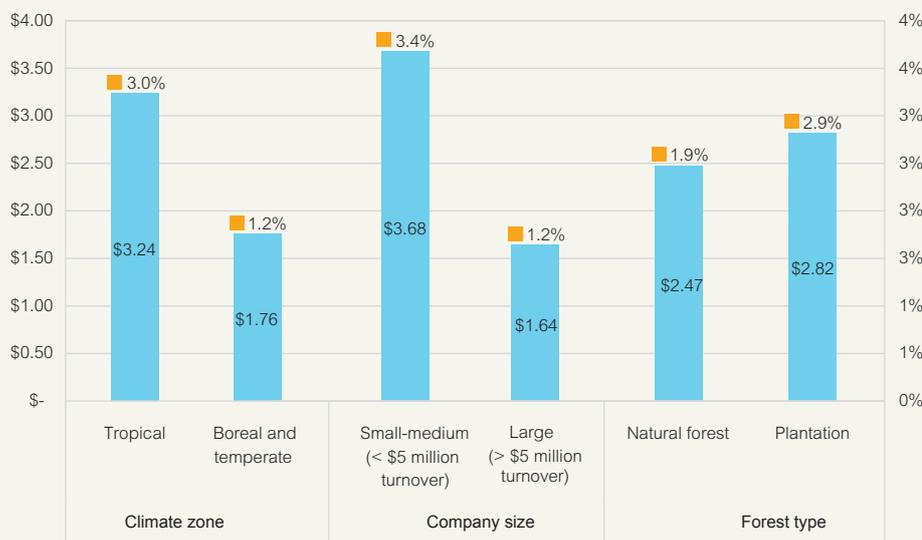
As shown in Graph 6, within the sample studied tropical producers and small/medium producers were paid the largest price premiums (3% and 3.8% of annual certified turnover), compared to temperate and boreal producers (1.2%) and larger companies (0.5%). Plantation managers earned slightly higher premiums (2.9%) than natural forest managers (1.9%) for their FSC-certified products.

The differences in price premiums are due to several factors. First, the higher premium for tropical producers indicates that the high-end market for tropical timber species is more willing to pay a higher premium for the products.⁵⁹ The higher premium for smaller producers can also be partly attributed to the niche markets they commonly supply. Lastly, the higher premium for plantation managers was likely due to the high market recognition of FSC logos in cork and pulp and paper

Graph 6: FSC premium per m³ of certified production by subgroup

Key

- Market premiums per m³
- Market premiums as % of certified turnover



markets. In fact, the paper sector is the fastest-growing market segment of FSC-certified products.⁶⁰

In addition to price premiums, a small subset of our samples reported the following financial benefits:

Operational efficiencies: All six natural forest managers interviewed responded that reduced impact logging (RIL), a key component of the FSC standard, had helped them increase operational efficiency through improved planning and waste reduction. Within the sample studied, four companies reported financial gains through improved operational efficiency.

In one case, the intensity of logging declined from 41 m³/ha in the pre-certification period to 38 m³/ha under RIL; however, the estimated net profit per m³ of wood harvested increased from approximately US\$18 to US\$26. Because this company sold its logs exclusively to an affiliated processing mill, much of this increase in revenue could therefore be attributed to an improvement in efficiency. The production manager of the company confirmed that the RIL methods, especially the investment in planning, allowed them to better identify what species to harvest, and to avoid cutting those that they could not sell in the market.

Another company reported that prior to FSC it opened up logging roads and skit trails whenever needed, causing not only loss of time but also wear and tear of equipment. After going through the certification process, road construction went down from 12 to 2 months per year because of better planning. The company observed savings in expenditures on fuel, machine maintenance and fixed capital investment.

Tax incentives: One company reported that by obtaining FSC certification, it was able to access the government’s tax credit programme, reducing its tax rate by as much as 50%, or 7.5% of total annual turnover. For this company, the tax incentive represents the single most important financial benefit of FSC.

Reduction in government payments: The research found a notable reduction in compulsory payments to government officials in two tropical cases. In one, the implementation of forest demarcation mapping, and management planning eliminated the need to pay government officials for such services. This has resulted in a saving of approximately US\$95,000 per year.

Additional/alternative sources of revenue: Six companies reported receiving subsidies from either NGOs or the government for their efforts to pursue FSC certification. In two cases, operators were able to tap into government grants targeting small/medium operators pursuing certification. In other cases, companies received funding from NGOs and researchers. According to one company, FSC certification has attracted researchers from Japan, Germany, the US, the UK, and Australia, as well as other visitors such as eco-tourists. In the period 2005-2013 this provided an average additional income of about US\$3,500 per year. These alternative sources of revenue tend to be short term (3-5 years) and relatively small in value, ranging from approximately US\$7,000 to US\$18,000 in total.

Notably, with support from external partners, three companies were measuring carbon emission reductions within their operation. If validated, this could lead to the development of carbon credit schemes under REDD+, which could generate alternative revenue sources for these operators.

Non-quantifiable benefits

Market access and retention: The majority of the companies interviewed saw relatively little new client acquisition through FSC. However, in more than half of the cases, the same companies also acknowledged that without FSC they would not have been able to maintain their current client base. In Malaysia, Portugal and Peru, companies argued that FSC certification is a prerequisite for accessing high-paying export markets. And at least one company landed major business thanks to its FSC status. In some cases, certification was seen as a ‘hedge’ against economic downturns. At equal offer, the market prefers certified products. In bad market conditions, certified producers maintained clients that competitors lost.

Management effectiveness and quality control: For operators in developing countries, FSC certification is more than a standard for forest management; it is perceived as a hallmark of good business management. Four companies remarked that the certification process helped them better understand their business assets, conduct annual and long-term planning, and identify areas for improvement.

Legal compliance: Five companies reported reductions in fines and other legal penalties as a result of complying with FSC, with one reporting significant improvements due to higher standard requirements and annual audits. Two companies also reported that following the FSC standard had made it easier for them to comply with government audit and FLEGT documentation requirements.

Reduction in accidents and safety incidents: Five companies reported reductions in accidents and safety incidents, ranging from major to minor improvements. Company management staff attributed the improvement in worker safety to several factors associated with FSC certification, including better safety gear and equipment, changes in corporate culture, and an increase in awareness among logging employees.

“In the course of negotiating issues such as obtaining permits for transit via protection zones, representatives of the local population take into account our status as an FSC-certified enterprise, which has a positive influence on the results of their decisions.”

Temperate/boreal operator E

“FSC is part of our continuous improvement programme. It ensures that the company is well managed and its forestry processes are of an internationally recognized standard. We think that the FSC certificate provides assurance to current and potential investors.” Plantation operator D

“Because we have an FSC certificate, it is very easy to get the necessary FLEGT documentation to export our timber to the EU. Others without a certificate have much more trouble to get it done.”

Tropical natural forest operator B

“We managed to win a tender to supply timber for a number of infrastructure projects for one of the largest international events. High quality timber products and the presence of an FSC certificate were major advantages which contributed to this success.”

Temperate/boreal Operator A

Improvement in staff morale: Seven out of eleven companies reported improved staff morale. This was manifested through higher employee satisfaction, work ethic, and a greater desire among employees to achieve targets. According to company management, it largely resulted from the increased investment in benefits to workers.

As previously discussed, on average 20% of companies' post-certification investment goes toward worker benefits, or an additional US\$250 per worker per year. However, the level ranges widely across companies, from zero to over US\$850 per worker per year. In several cases, company managers argued that investment in employee benefits shows positive returns through employee performance.

External stakeholder relations:

Six companies interviewed experienced improvements in relations with local government, business partners and communities. One company mentioned that FSC gives it credibility in the eyes of local communities and assurance that their voices will be heard. A similar point was made by two other companies. In one case, the company had trouble dealing with illegal logging by local people prior to obtaining FSC certification. But, as per FSC requirements, they established a Social Forestry Committee – and the incidence of illegal logging dropped to zero. Another company stated that the relationship it developed with NGOs and the research community was very valuable. These stakeholders bring in not only forest management expertise, but also the latest scientific knowledge and research capacity that helps the company innovate and maintain competitive advantage.

5. Cost-benefit analysis

The following analyses compare annual post-certification costs with annual financial benefits. The aim is to show the impact of FSC adoption on annual cash flows in the course of running a business. Overall, within the sample studied, **FSC implementation had a positive impact on annual cash flows. Financial benefits averaged US\$6.03 per m³ of roundwood equivalent production, outstripping average annual costs and estimated opportunity costs of US\$4.23** (see Graph 7).

Graph 7: Net financial benefits of FSC per m³ of certified production



Segmenting the companies into sub-groups provides further insights, as shown in Graph 8. **Operators in the tropics show the largest annual net benefits, while temperate and other zones show an average annual loss.** This is likely due to the improved premiums the former gain by winning access to higher-paying markets, as well as slightly lower increases to their post-certification costs. **Small/medium producers also accrued net benefits.** Their average financial benefits were more than double the amount for large producers, who on average experienced a loss. Similar effects were experienced by natural forest producers over plantations.

Graph 8: Net financial benefits of FSC per m³ of certified production by subgroup

Key

- Total annual financial benefits
- Total post-certification annual costs (incl. opportunity costs)



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FSC-certified cork stoppers.

**FOR SMALL/
MEDIUM
COMPANIES
WITH REVENUE
LESS THAN
US\$500 MILLION,
OPERATING
MARGIN WENT
UP BY 1.44% FOR
EACH YEAR OF FSC**

Box 3. Are companies' financial performances correlated with their FSC status? An alpha analysis

The WWF research team also conducted an econometric analysis on how publicly-traded forest companies with FSC certificates have performed over time relative to their industry peers.

In collaboration with the New York University Stern School of Business, we collected the annual financial data of over 100 publicly traded forestry companies from around the world for the 2006-2013 period. This data was then normalized for exchange rates, company size, inflation rates, etc. Approximately 30% of the companies held FSC certificates. The dataset was also segmented according to attributions such as revenue, major markets, regions of operation, and main products. A panel data analysis was conducted to investigate the relationship between FSC and key financial outcomes.

Overall, FSC showed no effect on company stock price, and very little correlation with gross and operating incomes. However, there was a statistically significant correlation with gross margins and operating margins. For companies with more than US\$500 million revenue, one additional year of FSC is associated with a reduction of gross margin of 0.015 percentage points. Similar negative effects are observed for large companies selling products to North American and Western European markets. In contrast, smaller certified companies showed an increase in gross margins. For small/medium companies with revenue less than US\$500 million, operating margin went up by 1.44% for each year of FSC, and 1.14% and 1.05% respectively for small/medium companies selling products to North America and Western Europe.

The differences between large and small companies are consistent with the empirical data collected through field research, which showed smaller companies accruing greater price premiums and over US\$2 of net benefits per m³ of certified production; whereas the annual cost-benefit for large companies was negative. Another possible explanation is the time period studied, given that it covers one of the largest economic recessions and housing market collapses in recent history. One might hypothesize that large companies were more severely hit financially as they tend to supply to the mass markets, while smaller companies tend to supply to niche markets that are less vulnerable to economic downturns.

It should be noted that in all cases the models explain less than 10% of variances in company financial performance, indicating that there are large variances that cannot be explained by their decision to pursue and maintain FSC certification. Further investigation is required to improve the robustness of the model and to credibly infer from this analysis the primary impacts of FSC certification on stock performance.

Case study 2 Improved management effectiveness and quality control

Company B has a long history in sustainable tropical forest management though it was initially solely focused on sustainable yields of timber. Prior to obtaining FSC, the company had already applied a silvicultural system focused on minimum cutting diameters, pre- and post-harvesting inventories, and silvicultural treatments such as replanting. After obtaining FSC certification for one of the concessions it manages, Company B quickly realized that the FSC standard would not only affect management of the forests, but overall management of the business.

The problem

Company B is currently in its second rotation of harvesting its natural forest concessions. In the past, it harvested just a few different tree species. This has expanded to more than 50 species, which has increased the complexity of harvesting and further processing, including logistics and administration. Prior to FSC, the company had its own system, “and it worked somehow,” according to a company manager.

The system, however, had many flaws. Because log registration was a part of the responsibility of personnel at the log landings, the increase in operational complexity reduced the staff’s attention to registration. The administration also gave rise to many mistakes: there was no system in place to check human errors, nor was there an incentive for precision and accuracy. As a result, there was just a rough idea of the available volumes of specific species. Management and planning divisions could not completely rely on the log registers, which with over 50 different species was a considerable challenge. The manager explains: “Many times this caused frustration and stressful situations when requested volumes finally could not be supplied to our customers.”

The solution

For FSC certification, Company B employed two additional people on the log yard who were fully responsible for the accurate administration and tagging of logs. “The main effort to get ready for certification was mentoring, mentoring and mentoring our people to change their mindset about how to do business. We had to do it over and over again,” says the manager. “Because FSC is very strict and concerned on tagging. We cannot make mistakes there, otherwise we will have trouble with FSC.” Although this was first seen as a necessity for getting the FSC certificate, it had profound benefits for the company itself. Company B now experiences far fewer mistakes in administration, making the log register much more reliable and useful for further planning. According to the manager, FSC has improved the company’s ability to plan for sales and marketing and saves them a lot of frustration and unpleasant surprises.

With the improvement in data quality and the introduction of the FSC standard, both company management and staff are paying greater attention to how logging operations are being done in the forest. This has resulted in improvement in product quality. “We find fewer deficiencies, fewer cracks in the logs than in the past because harvesting, hauling and transport have been improved,” says the manager.

As Company B’s experience illustrates, FSC certification has proved to be an effective management tool that allows forest operators to measure and improve production processes and product qualities.

FINANCIAL RETURNS OF FSC

1. Net present value of FSC

Net present value (NPV) analysis provides a combined analysis of all the aforementioned costs and benefits (cash inflows and outflows), accounting for when they occur. A positive NPV theoretically means that an investment adds value, or profit, to a firm. An NPV of zero means there is no change in value, and a negative NPV means that it will reduce profits – thus a positive NPV can constitute a business case for FSC (see *Methodology*, Annex 1, for a description of how the NPV was calculated).

Results

The analysis revealed on average a **positive NPV from the decision to pursue FSC of \$1,333,020, or \$9.04 per m³ of certified production** (Table 5).

Table 5: Net present values of pursuing FSC certification

Average NPV of pursuing FSC	Per m ³
US\$1,333,020	US\$9.04
Average NPV per year – Tropical	
US\$1,108,672	US\$25.34
Average NPV per year – Boreal & temperate	
US\$1,512,498	US\$(4.00)
Average NPV per year – Large	
US\$1,801,422	US\$0.03
Average NPV per year – Small/medium	
US\$747,517	US\$20.31

The highest NPVs per m³ of certified production were achieved by tropical forests, where research participants displayed an average NPV of US\$1,108,672, or US\$25.34 per m³ certified production. While these companies tended to have higher pre-certification costs and relatively long ramp-up times, this was outweighed by the increase in prices they achieved over the longer term.

This result was followed by small/medium producers (< US\$5 million turnover), who experienced an average NPV of US\$747,517, or US\$20.31 in value per m³ of certified production. **Thus, overall, the greatest quantifiable financial benefits from FSC were achieved by small/medium companies and producers in the tropics.**

Large producers also showed on average a positive NPV, although the amount was negligible on a per m³ basis. Temperate and boreal forest managers displayed on average a positive NPV overall, but a small negative NPV per m³ of certified production. This difference is caused by several companies with negative outcomes and low annual certified production, who swung the average NPV per m³ into the red.

Adjusted NPV: incorporating HCV set-aside opportunity costs

The NPV models above are based on empirical, historical data. As discussed in Box 2, good data on HCV set-aside opportunity costs was not available, and thus had to be modelled separately with several layers of assumptions. It is therefore likely less accurate. Nonetheless, it is valuable to project how the foregone production – and associated cash flows – affects the overall profitability of choosing to adopt FSC.

In the following analysis, the HCV set-aside opportunity cost is incorporated into the NPV analysis. The two companies for whom reliable HCV information was not available are excluded, thus bringing the sample size down to seven.

The results of the adjusted NPV analysis are similar to the original NPV analysis. **On average, it reveals a positive NPV of US\$1,180,429, or US\$6.69 per m³ of certified production** (Table 6).

Table 6: Adjusted NPVs of pursuing FSC certification

Average NPV of pursuing FSC (with HCV)	Per m ³
US\$1,180,429	US\$6.69
Average NPV per year – Tropical	
\$ 837,614	US\$21.32
Average NPV per year – Boreal & temperate	
\$ 1,454,681	US\$(5.01)
Average NPV per year – Large	
\$ 1,547,763	US\$(3.04)
Average NPV per year – Small/medium	
\$ 721,263	US\$18.86

Once again, **the highest NPVs per m³ of certified production were experienced in the case of tropical forests**, where research participants displayed an average NPV of US\$1,208,672, or US\$21.32 per m³ of certified production.

This was followed by small/medium producers, who experienced an average NPV of US\$721,263, which translated into US\$18.86 per m³ of certified production. Boreal and temperate producers, as well as large producers, showed on average a positive NPV overall, but a negative NPV per m³ of certified production.

Graph 9 shows the results of the original vs. adjusted NPV analyses side by side in subgroups.

Graph 9: NPVs per m³ certified output – with and without HCV set-aside opportunity costs, by sub-group.

Key

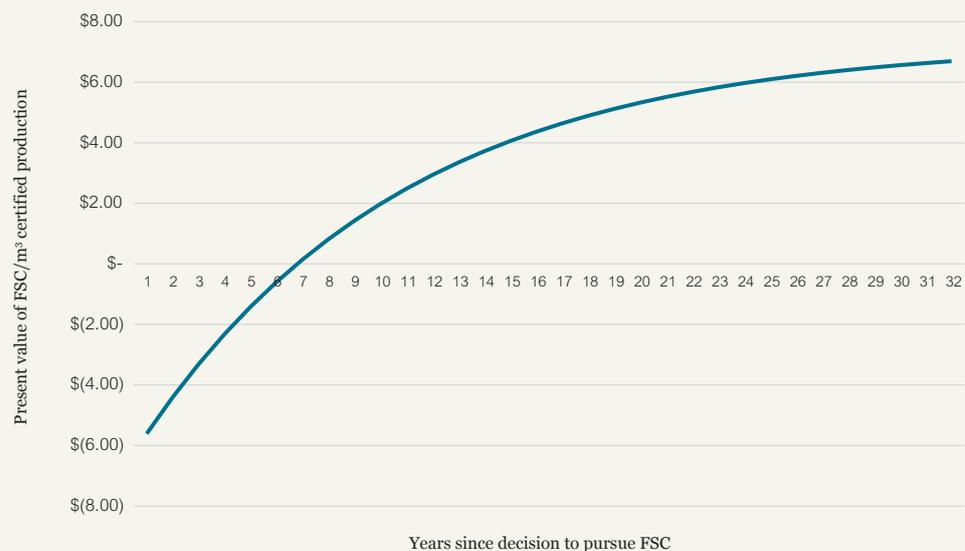
- NPV/m³ without opportunity costs
- NPV/m³ with opportunity costs



2. Break-even analysis

Break-even analysis models how many years it takes a project to recoup initial investments. While the break-even analysis can be performed on nominal cash flows, providing a more positive picture, the model below assesses the number of years needed to achieve a positive NPV. Thus, all future cash flows are discounted to account for the time value of money. **The break-even analysis of the adjusted NPV (including HCV set-aside opportunity costs) shows that it will take, on average, six years for a company to break even on the investment in FSC (Graph 10).**

Graph 10: Break-even analysis of adjusted NPV



3. Sensitivity analysis

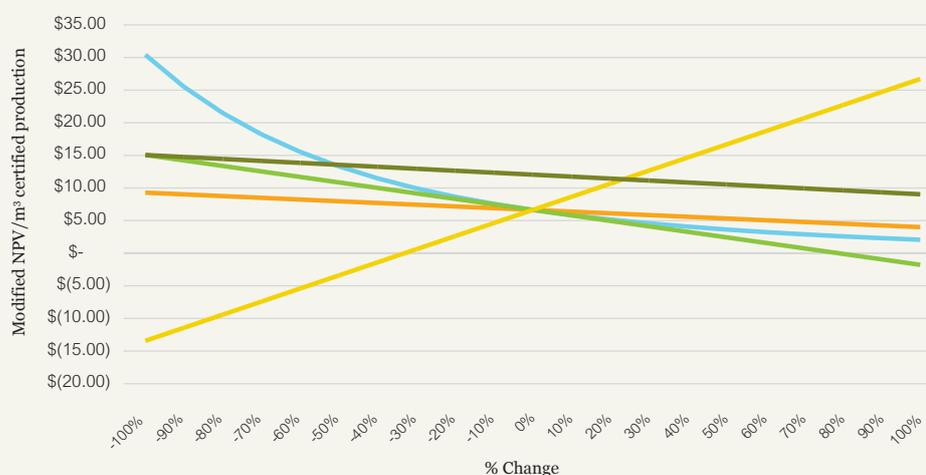
The following sensitivity analysis shows the extent to which the adjusted NPV results are affected by percentage changes in the specific cost and benefit factors examined earlier in this study. These factors include discount rate, pre-certification costs, post-certification costs, premiums, and HCV set-aside opportunity costs.

These sensitivity analyses freeze all data except for the independent variable being tested. The analyses are first performed on each individual company, and then collectively averaged, in order to provide equal weight to all companies.

Graph 11: Sensitivity analysis of NPVs

Key

■	Discount rate
■	Pre-certification (upfront) costs
■	Post-certification annual costs
■	HCV set-aside opportunity cost
■	Price premiums



For all but the HCV sensitivity analysis, the two companies excluded from the adjusted NPV analysis due to questionable HCV data are added back in; however, their HCV set-aside opportunity costs are not included.

The primary findings of the sensitivity analysis, as shown in graph 11, are:

- NPV is highly sensitive to the company discount rate when the discount rate is low. While the NPV always remains positive, when the discount rate is below approximately 10% it swings upward dramatically as the long-term benefits of FSC take on more weight.
- NPV is highly sensitive to FSC price premiums. Once average premiums are cut by approximately 50% or more, the NPV becomes negative.
- NPV is also sensitive to annual post-certification costs, although it only becomes negative when they increase by nearly 80%.
- NPV is not very sensitive to HCV set-aside opportunity costs. For example, a 100% increase in annual HCV set-aside opportunity costs, according to our models, only results in a 25% decrease in total NPV. A 100% decrease in HCV set-aside opportunity costs (i.e. zero HCV set-asides) results in an equally modest increase in NPV.
- NPV is least sensitive to pre-certification costs – i.e. to a company's upfront investment in FSC. These expenses, while still meaningful, are greatly outweighed over time by other factors.



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“Montados” landscape, the corklands where cattle graze and plantations of pine and eucalyptus grow side by side together with cork trees. In these landscapes, high conservation value forests alternate with farmland systems, which integrate extensive agriculture, forestry, grazing, hunting and other recreational uses. Algarve region, Portugal.

Case study 3 Improved production efficiency

Company C has been logging in natural tropical forest for about 50 years, specializing in forest management and high quality lumber production to cater predominantly to European markets. Its experience illustrates how FSC certification can improve the efficiency of forestry operations.

The problem

Before working toward FSC certification, Company C hardly conducted any pre-inventory or mapping of the trees. Mr DC, director of Company C, explains: “Our forest management was like walking in the dark: we did not know what we would find in the forest.” Running through the forest to find the high value individual trees was common practice. The log landings were the first places that would tell them what they had harvested. Tracking and tracing systems were hardly in place, and harvested trees were too often left in the forest because skidder operators did not have an accurate system to find all the harvested trees. As a result, there were high timber losses as only timber with high value and few deficiencies was marketed.

The solution

During FSC certification, the company introduced a new tracking and tracing system and conducted pre-harvesting inventories. The site manager explains: “Now we have information on all trees and know exactly where to go. This makes a big difference.” Work has been streamlined on various levels. Monitoring, geo-referencing of trees, and timber tracking provide full transparency and make planning much more reliable and effective. Planning is now an integral part of forest management and sawmill activities. Felling of trees has become more selective and less waste is produced; all timber is extracted. The site manager notes: “We now have a general sense of control, structure and overview.”

This sense of control has been directly translated into cost-savings on operations. According to the site manager, it used to take Company C 12 months to construct roads, but now it takes only two months. This saves fuel and reduces maintenance costs. “Next year we even hope to improve and reduce the required time further,” says the site manager.

Improved planning has also led to cost-savings on personnel. “When I joined the company in 1994 there were 48 staff in one forest operations team. This has been gradually reduced to the 19 staff per team we have nowadays.” Meanwhile, annual harvested volumes have seen a reduction of only about one-third.

Furthermore, Company C created a local outlet for waste wood, which was introduced solely because of FSC certification. Around 20% of roundwood volumes (offcuts) are given for free to a local community initiative that employs 14 staff and sells 1,200-2,400 boards per month. This generates about US\$900 per month for the community. Twelve workers receive 50% of sales revenue. The other 50% goes to two managers and a small fund that is used for social projects.

This activity not only stimulates the local economy, it also enhances timber use efficiency – and it provides responsibly produced timber to the local population through which local pressure on the forest is reduced.

CONCLUSION

FSC certification is a landmark tool in sustainable forestry and a benchmark for global mainstream forestry operations and investment.

There is nonetheless a gap in the existing research, despite a 25-year track record: the absence of a comparative, quantitative, and line-item-specific analysis of FSC's economic impact on forest operators. In a review of the existing literature (29 studies analysed) a wide range of FSC premiums were reported, from zero to over 50% of market price, along with a myriad of qualitative benefits. Costs were often estimated as lump-sum figures based on companies' self-reporting, which also varied widely from US\$2.50 to US\$25 per hectare for pre-certification cost, and from US\$0.07 to US\$39.31 per hectare for post-certification cost. These estimations, while informative, vary widely and do not allow for in-depth analysis of underlying drivers or comparisons across companies.

The primary research in this report helps to address this gap. Yet it is not all-encompassing, and should simply be considered as a starting point. Eleven entities with diverse operations across four continents were studied in depth through acquisition of proprietary data and in-person interviews. Findings are segmented into pre-certification costs, post-certification annual costs, annual financial benefits, and an NPV analysis, which combines all these elements into a single model.

The total average cost of *obtaining* FSC certification for the 11 participants was found to be US\$3.74 per m³ roundwood equivalent of certified output, or US\$2.01 per hectare of certified forest. Total average costs associated with *maintaining* FSC certification were US\$3.71 per m³ of certified output per year, or US\$4.16 per hectare of certified forest per year. Some 15% of upfront costs, and 20% of post-certification annual costs, were spent on workers' safety, facilities, and livelihoods.

The total annual financial benefits of FSC averaged at US\$6.03 per m³ roundwood equivalent certified production, and thus outstripping annual FSC costs but varied significantly between research participants. The largest share (42%) of this annual benefit came from price premiums, followed by improvements in operational efficiency. Thereafter, companies also experienced miscellaneous additional benefits from FSC, such as tax incentives, reductions in compulsory payments to government officials, and additional sources of revenue such as NGO or government support, carbon credits or tourism/research fees.

Tropical forest managers and small/medium producers accrued the largest average net benefits. Additionally, companies reported significant qualitative benefits of FSC such as market access and retention, management effectiveness and quality control, legal compliance, reduction in accidents, stakeholder relations, and improved staff morale.

The NPV analysis revealed a positive average NPV of US\$1,333,020, or US\$9.04 per m³ certified production, from the decision to pursue FSC. Tropical forest producers and small/medium producers were the largest beneficiaries. When the opportunity cost of setting aside productive areas for HCV protection was taken in to account, the average NPV per m³ of certified production dropped by 26%, but the overall trends remained positive.

The research also found that, on average, it took six years for a company to break even on its investment in FSC. Finally, a sensitivity analysis indicated that the financial return on FSC investment was highly sensitive to discount rate and FSC price premiums, while various costs and opportunity costs played a less important role.

From a small yet diverse sample the preliminary results suggest that the financial benefits of FSC tend to outweigh the costs; albeit with significant variation based on company location and product type, and with special consideration required for set-asides and intangible benefits.



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Taking measurements of a Shihuahuaco tree, Peru.

RECOMMENDATIONS

Financiers

Many banks and investors require or encourage their forestry clients and investments to meet sustainability criteria and become certified. For example, a group of global banks including Barclays, Rabobank, Deutsche Bank, UBS, Lloyds Banking Group, Westpac, BNP Paribas, Santander, RBS and Standard Chartered have entered a “Soft Commodities Compact” requiring (among other things) that forestry clients in high-risk geographies adopt credible third-party forestry certifications such as FSC. These policies support risk management and regulatory compliance. However, this study suggests banks may also benefit from a purely financial perspective.

We recommend that financiers encourage the uptake of FSC certification by their customers, and within their investment portfolios, as a tool to:

- Manage risk and help achieve regulatory compliance
- Enhance profitability and reduce risk among forestry companies
- Help “buy down” due diligence costs by outsourcing legal compliance, initial audits, annual inspections, and chain-of-custody checks to third-party experts

We also recommend, due to the varying legacies and challenges companies face, that financiers engage non-certified clients, ideally with reasonable time-bound plans, to achieve FSC certifiable standards of production. A number of tools are available to help financiers and companies. WWF’s *The 2050 Criteria* identifies key risks and mitigants for structuring forestry investments and policies, and the stepwise approach developed by the WWF Global Forest & Trade Network (GFTN) helps companies exercise due diligence and achieve responsible sourcing of forest products. Additionally, the UN Food & Agriculture Organization (FAO), the International Finance Corporation (IFC), the World Business Council for Sustainable Development (WBCSD) and Pricewaterhouse Coopers (PwC) – through The Sustainable Forest Finance Toolkit – provide useful tools and guidance.

Financiers should also consider developing new financial products to help companies cross the FSC investment hurdle. In particular, small/medium companies can be challenged by upfront cash outlays; yet this research indicates that they may achieve the greatest long-term financial benefits.

Forest operators

We recommend that forestry companies add the “bottom line” to the set of potential advantages to be considered in pursuing FSC certification. This study shows that while the investment costs of entering into an FSC certification process can be considerable, achieving FSC certification produced a net positive financial outcome for certain types of forest operators.

Many FSC-related investments can improve operational efficiency and business management, thereby reducing overall costs over the long term. Investment in better planning and silvicultural treatment, for example, can not only cut operation waste, but also protect the asset values of timber resources.

Additionally, investment in environmental and social impact assessment and mitigation, which accounted for over 40% of post-certification annual costs, can help

reduce operational risks in highly uncertain business environments. These costs, as well as costs associated with maintaining and enhancing HCVs (whether through modified logging practices or setting-aside areas), did not have a significant impact on the value derived from FSC in the study sample.

Buyers

Forest product buyers are increasingly facing scrutiny of purchase policies – either government mandated or market induced. In this environment, buyers should consider incorporating FSC in their procurement policies because, as indicated by the majority of the producers studied, FSC helps ensure compliance with legal requirements and beyond.

An added benefits for sourcing FSC is that through committed action, buyers of forest products can reduce reputational risks associate with “business-as-usual’ logging practices, such as deforestation, community conflict, and violation of human rights.

The research also found that FSC-certified operators make high levels of investment to meet environmental and social standards in their respective countries. We recommend that global brands and buyers play a bigger role in promoting consumer awareness of FSC and leverage the FSC label to differentiate in the marketplace based on positive impact.

Governments

This research has shown that FSC-certified companies make significant investments in public goods that benefit society at large. Governments have a crucial role to play to encourage such investments. We recommend governments to provide a level playing field to ensure that companies and communities pursuing FSC are not out-competed by their counterparts engaged in unsustainable practices, and so that forestry can compete with other land-uses.

The high cost of obtaining certification in the tropics, for example, can be partly attributed to unclear land tenure and heavy administrative burdens in the countries studied. Government in these countries should step up their efforts to define land tenure for forest and indigenous communities and streamline legal requirements for forestry operations.

In consumer countries, governments should double down their efforts to prohibit products made from illegally-sourced timber from entering their markets. Some governments have initiated legislations to eliminate the imports of illegal timber products (e.g. the EU Timber Regulation, the Lacey Act, and the Australian Illegal Logging Prohibition Act). However, many secondary wood and paper products are not covered by the prohibition, allowing illegal products to continue flowing into the markets. We recommend more comprehensive legal action, accompanied by stronger policy preference for responsible forest certification of wood product imports.

FSC

The report illustrates that direct certification costs are considerable: 34% of the total costs in the pre-certification stage and 14% post-certification. For smallholder operations this is particularly significant. We recommend that FSC consider lowering direct certification costs without undermining the rigor and quality of the audits. An area of improvement highlighted by this research was to have clearer guidance on environmental and social impact assessment and mitigation.

In addition to cost reduction, FSC should consider collaborating with financiers and donors to develop financial products that help small/medium producers to achieve certification. This report indicates that this segment reaps the greatest financial benefits from adopting the certification; and yet they are often deterred by the upfront cash investment. This gap seems ripe for financial innovation.

Finally, the most robust business case for FSC could emerge through annual economic data shared anonymously by all FSC-certified forest operators. FSC should consider incorporate key economic indicators into its reporting requirements, potentially fuelling breakthroughs in research and financial innovation to support further adoption of the standard.

Researchers

As noted throughout this report, lack of primary data analysis on the economic impact of forest certification is a hurdle for informed decision-making by forest managers and policymakers. Expanding the research sample size using a harmonized approach to data collection and analysis is needed to extrapolate the research findings. We therefore recommend that the research community adopt and adapt the methods and Key Performance Indicators (KPIs) tested through this research to generate comparable results and help build our collective knowledge.

Additionally, future research should explore further quantification of opportunity costs and non-financial benefits – such as operational efficiency. This can help paint a more comprehensive and realistic picture about the total return on investment.

Lastly, while this initial research has provided valuable insights, these findings merit follow-up studies with more datasets to validate their general applicability. A specific area of future research could be to analyze the costs and benefits further downstream focusing on traders and retailers, which could lead to a more equitable division of the benefits in the supply chain.

Finally, the research shows the value that FSC can add to forestry assets, but like many other studies, it is clear this value depends on company context. Advocates of responsible forestry need to support forest managers and investors with tools to assess where investing in certification brings most benefit. WWF has begun work on such tools but a broader alliance of partners is required to make these standard practice.



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A worker places a forest management scheme ID tag, Peru.

ANNEX 1. METHODOLOGY

This report attempts to explore whether there is a purely economic case for forest operators to adopt FSC certification, and for financiers to prefer it. Specifically, the research was guided by the following questions:

1. What are the average financial costs and benefits incurred by major classifications of forest operators as a result of complying with the FSC certification standard?
2. What are the main drivers of these financial impacts?
3. Are there concrete cases where FSC certification serves the financial interest of forest operators and their investors?

To answer these questions, the research team adopted a mixed-method approach to capture as wide a range of information as possible in a systematic manner. Each mode of analysis is briefly described below.

Literature review

The authors reviewed 29 academic studies, and 2 publications by reputable consulting companies, which examine the costs-benefits of FSC implementation for individual forest operators. Key findings from these studies were synthesized and summarized in Table 1 and briefly discussed thereafter. Wherever possible, quantitative assertions of costs and benefits were discussed in detail and their drivers assessed. The analysis is followed by a brief discussion of research gaps. A full list of studies reviewed can be found in the reference section of this paper.

Financial cost-benefit analysis

Financial data was collected primarily through in-person interviews with company management at head offices and in the field, as well as through a review of financial reports, audit reports and other supporting documents. This primary data is proprietary and typically difficult to attain.

A total of nine companies and two smallholder groups across the globe were recruited for this analysis through their existing participation in the Global Forest & Trade Network (GFTN), a WWF platform that promotes responsible forestry and trade in forest products. Organizations participating in GFTN have made public commitments and demonstrated progress toward responsible forest management, and therefore constitute an ideal sample for this research. A great deal of in-depth information was collected from each company, using nearly 100 indicators. However, given the overall small sample size of 11 entities, the results must be seen as indicative and not predictive. Individual company results can vary greatly based on unique conditions.

Every attempt was made to isolate the incremental financial impacts resulting from the decision to pursue FSC alone – as opposed to business strategy, legal requirements, etc. – although this remains a challenge and limitation. Furthermore, data is based on a before/after analysis of each company, and thus the counterfactual is business as usual. There is no attempt to compare the impact of FSC to other certification schemes that might have been pursued, etc.

To standardize data collection, a template was created containing 54 key performance indicators (KPIs) and an additional 39 sub-indicators focused on operational costs. In instances where companies did not have data for an indicator, or the data provided was in doubt, it was omitted: values were marked as “Not Available” (as opposed to zero) in the dataset. A full list of KPIs can be found online.

The data collected was then harmonized via the following steps:

Currency normalization

Varying currencies were harmonized by converting all figures to US dollars, utilizing average annual exchange rates for each year (as found on www.oanda.com/currency/historical-rates).

Price normalization

All figures are corrected annually for inflation, based on the figures provided by the IMF (www.imf.org/external/pubs/ft/weo/2014/02/weodata/index.aspx).

Certification costs and benefits normalization

a. FSC vs. non-FSC

Only incremental costs and benefits resulting from certification are used in the calculations – i.e. costs and benefits are only accounted for if the company would not have experienced them without FSC. Because companies have different baselines (for example, some comply with legal standards while others follow industry norms), what constitutes incremental change due solely to FSC is subject to the companies’ judgement. To ensure data consistency and accurate depiction of financial costs, the research team made extra efforts to separate the costs relating to FSC certification from those required purely for legal compliance.

b. Pre- and post-certification costs

This study distinguishes between pre- and post-certification costs, in which “pre” are all the costs to initially become certified. After the certificate has been obtained, all recurring costs are considered “post”. Pre-certification costs are calculated as a one-time payment, regardless of the number of years taken to obtain the certificate. All post-certification costs are considered as average annual costs.

c. Mixed costs

In some cases, cost data could only be obtained related to a group of KPIs – for example a mixture of training, monitoring and staffing costs occurring simultaneously. In such cases, the collective costs have been attributed as realistically as possible to the different specific cost items.

d. Price premiums

Where possible, price premium data was collected as absolute numbers, but also occasionally as percentages on top of the traditional price for non-certified products. In some cases price premiums were incidental; in other cases, price premiums were structural and predictable. This data was harmonized by calculating best estimates of the average percentage of the price premium above the price for non-certified products. Some companies produce a mix of different certified (and non-certified) products. To obtain comparable data, price premiums over different products were aggregated into one estimated number for all products. The main challenges in reaching best estimates for price premiums include:

- Volatility of prices;

- Volatility in demand and variation in required certified wood species;
- Variation in effective price premiums (as each transaction can be different even with the same client);
- Lack of access to real sales data;
- Lack of insight into price premiums by the companies themselves due to complexities in price negotiations and different buying strategies of clients (such as lowering the base price and then adding premiums);
- Company or government policies to sell products at fixed prices to other (affiliated) processing companies.

Acknowledging these limitations, and the overall small sample size, the research team is nevertheless confident of the prices and price premiums estimated for this study as they were derived from companies' best available data and industry expert knowledge.

e. Discount rates

A unique discount rate was determined for each company based on country, sub-sector, and product mix in 2013. The discount rates range from 7.5% to 14.5%.⁶¹

Company size and type

To make results comparable across a range of company sizes and product classes, results of the analysis are typically presented on *per cubic metre of certified production* basis. Thus a large and a small company can be compared side by side, as well as averaged together, on the basis of the costs and benefits they experienced per unit of certified product sold.

Overall, accessible data was either patchy or in some cases questionable and therefore omitted in the analysis or highlighted as such. Yet total findings include over 500 quantitative data points complemented by extensive qualitative information capture. The results were therefore sufficiently robust to present in an aggregated format as averages and ranges for key indicators, and then to compile those into thematic sub-totals and overall NPV calculations. Other difficult-to-quantify, yet important, cost and benefit drivers are also discussed.

Net present value (NPV)

Cash flows are discounted back to the year in which the decision to pursue FSC was first made and preparations began ("Year 0"). Discount rates are country- and company-specific and were generated by FORM Valuations, a consulting firm specializing in valuation and financial analysis of forestry companies. The model projects 30 years forward, beginning at the end of Year 0, and thus includes 31 periods in total. Cash flows are based on operating income and do not include taxes or interest payments, which were unknown. Results are presented on a per cubic metre roundwood equivalent of certified production basis – i.e. the total NPVs are divided by a company's m³ certified production, not total production.

All averages, including for the NPV models and sensitivity analyses, are first calculated on a per company basis, and then combined, in order to best represent individual company experiences. Especially given the patchwork of "not available" data points, this approach is mathematically and conceptually different from averaging all line items, discount rates etc. across companies, and then performing a single NPV. Two out of the 11 cases, for whom crucial data on pre-certification costs was missing, are eliminated from the exercise.

The present value (at Year 0) of pre-certification costs was calculated by evenly dividing all pre-certification costs over the years during which companies prepared for FSC, and then discounting back to Year 0.

The present value of post-certification costs was calculated by discounting annual costs and benefits back to the first year certification was actually achieved, and then discounting that single value back to Year 0. This method ensures that FSC benefits and associated costs are not included during the FSC ramp-up period, before a certificate is attained.

The NPV then combines these two calculations.

It is important to note that because NPV calculations are so effective at aggregating data, they can also be misleading. Simply because a factor cannot or has not been quantified does not mean it may not emerge as important to the long-term performance of the company (e.g. staff morale or brand stature). The results presented are averages from a small sample size, and individual company results will vary.

Case studies

Both the literature and companies interviewed for this research confirm that FSC delivers many benefits that cannot be squarely measured in financial terms. To illustrate these benefits in more detail, four case studies were included in this report. Each case study sheds light on ways in which FSC has benefited the bottom line. Case study themes include improvements in operational efficiency, management effectiveness, strategic positioning, and new client acquisition.

Limitations

1. The 11 participating certified entities represent a range of sizes, geographies and sub-sectors. High variance was observed for certain indicators in relation to these characteristics. Therefore, strict comparisons between and within the groups must be undertaken with caution. Moreover, the results of this assessment should not be extrapolated to explain the forest sector as a whole for any given country or region. Instead, the analysis should be viewed as a guide for forest managers and investors in analysing individual projects.
2. Some of the companies participating in this research have been operating with FSC for over a decade, while others have only been certified for a little over one year. There was at times a lack of pre-certification and post-certification data available for comparison. Therefore, only those indicators with data provided by the majority of the participants were quantitatively assessed. This means that not all costs and benefits are accounted for if data points were insufficient. In some cases, individual companies for whom data was missing for a given indicator are excluded from the average.
3. The authors of this paper acknowledge that in a before/after study setting, many factors other than certification can affect businesses' operational and financial performance. Such factors include market conditions, natural conditions, and non-certification-related management decisions.
4. While the research team attempted to capture as wide a range of costs and benefits of FSC certification as possible, not all indicators could be properly assessed owing to data constraints. One of these indicators is the opportunity cost associated with HCV set-aside areas, because companies did not maintain consistent baselines against which it could be assessed. Instead, the authors modelled the HCV set-aside opportunity costs based on estimates (see Box 2).

5. Another potentially important indicator is long-term asset value. While a number of companies anecdotally reported declines in the quality of forest resources prior to pursuing FSC certification, few have conducted proper assessment of their forest inventories prior to FSC certification. Although the authors were not able to directly assess the impact of FSC on companies' forest assets, the anecdotal evidence is summarized in the literature review section.
6. Lastly, the baseline of this research is business as usual, or a typical company's current practice. It does take into account the cost of legal compliance, but does not compare FSC with other certification standards.



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FSC wood furniture.

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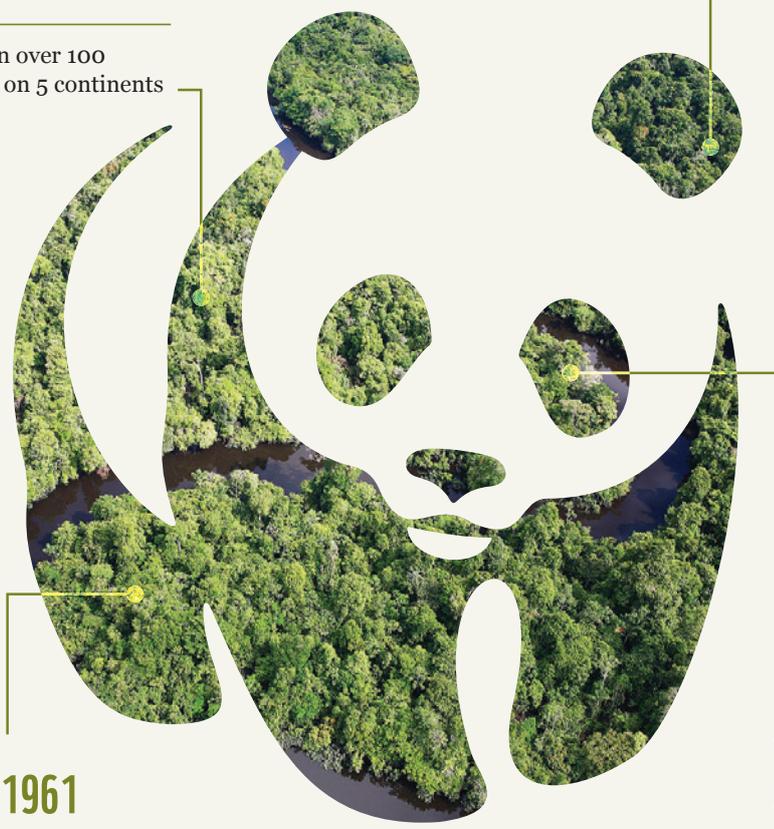


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