

## 10 FORESTRY MARKET



Forests cover 31 per cent of Earth's land surface and provide ecosystem services that affect air, water and soil quality.<sup>1</sup> They are likewise crucial to the global economy, employing nearly 14 million people in more than 160 countries, and their value added accounts for 1 per cent of the world's GDP (roughly US\$700 billion) (Food and Agriculture Organization of the United Nations (FAO), 2011. In 2012, 2.2 billion cubic metres of forest products were produced, of which 19 per cent was exported, for a total value of US\$233 billion (ForesSTAT, 2013)<sup>2</sup> (see Table 10.1).

Forests play a critical role in maintaining local, regional and global ecosystems. Practices related to the use of forests have important short- and long-term impacts on biodiversity,

habitat, and watershed and soil quality, not to mention economic development. As a result, sustainable forest management has been a preoccupation of governments around the world for many decades. More recently, the private sector, consumers and NGOs have sought the use of voluntary sustainability standards as key instruments for facilitating a broader market transformation toward the adoption of sustainable forest management practices.

Below, we review the most recent market trends for the two major international voluntary sustainability standards operational in the forestry sector, the Forest Stewardship Council (FSC), established in 1993, and the Programme for the Endorsement of Forest Certification (PEFC), established in 1999. Although these initiatives do not necessarily serve to address the fundamental causes of deforestation or forest degradation, they can be important tools, especially when combined with policy and legislative efforts, to demonstrate and increase demand for sustainable forest management. By mid-2013, these initiatives had together certified 9.1 per cent of global forested area and 23 per cent of managed forests (see Figure 10.1).<sup>3</sup> Canada, the United States, Russia, Finland and Sweden are the countries with the most standard-compliant forests certified; Figure 10.2 breaks this down by standard.

<sup>1</sup> Ecosystem services provided by forests include the regulation of water regimes, maintenance of soil quality, limiting of erosion and modulation of climate. Forests are also key components of biodiversity health (FAO, 1997).

<sup>2</sup> In this case, "forest products" is a grouping of the following categories: chemical wood pulp, chips and particles, dissolving wood pulp, hardboard, industrial roundwood wood in the rough, tropica, insulating board, medium-density fibreboard, mechanical wood pulp, newsprint, other fibre pulp, other industrial roundwood Trd, other paper and paperboard, particle board, plywood, printing and writing paper, pulpwood, round and split Trd, recovered paper, saw logs and veneer logs, sawn wood, semi-chemical wood pulp, veneer sheets, wood charcoal, wood fuel Trd and wood residues.

<sup>3</sup> This takes into account a 13 per cent reduction in aggregate volume, in order to account for estimated double certification.

FIGURE 10.1 CERTIFIED VERSUS UNCERTIFIED FOREST AREA, 2013.

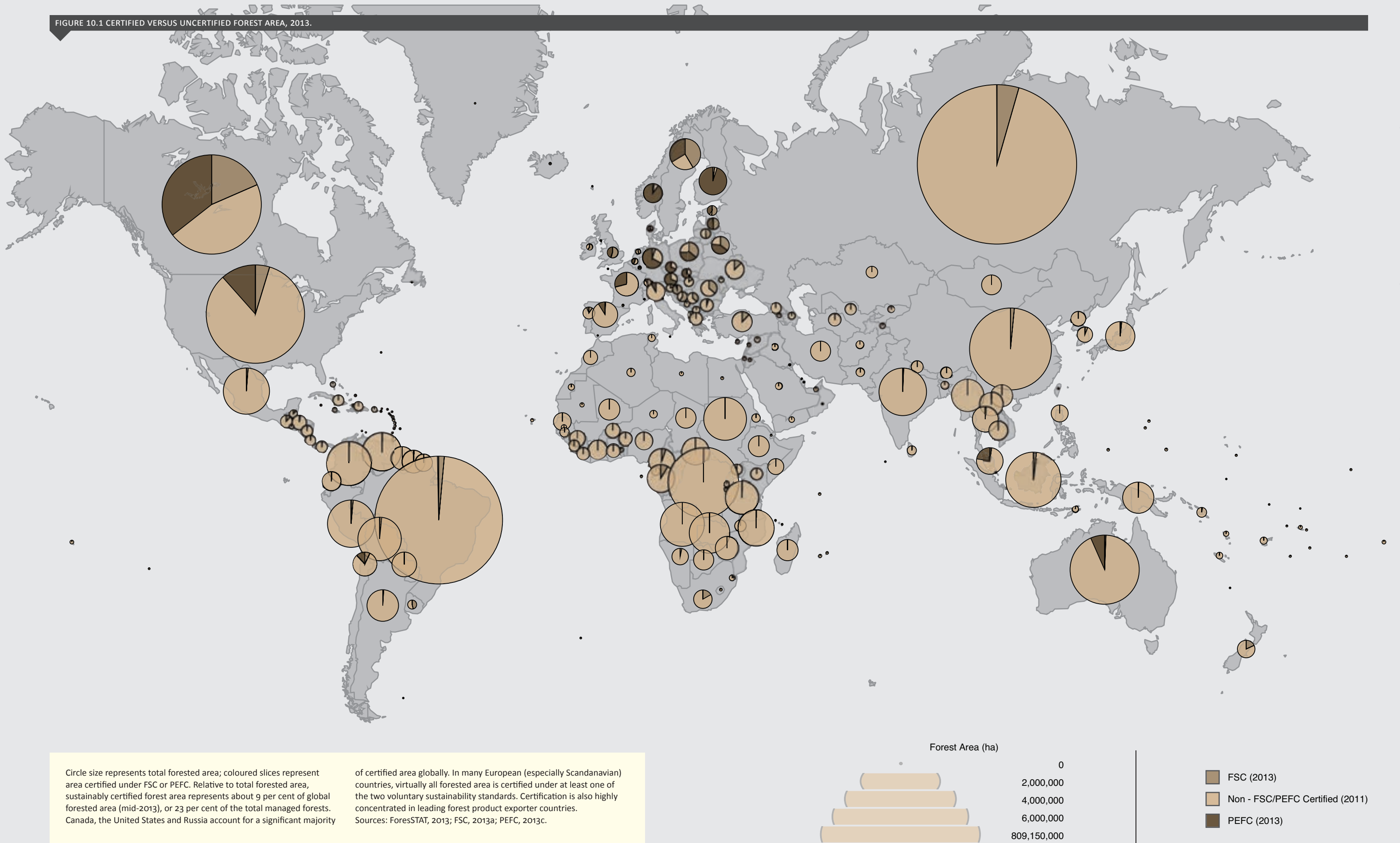
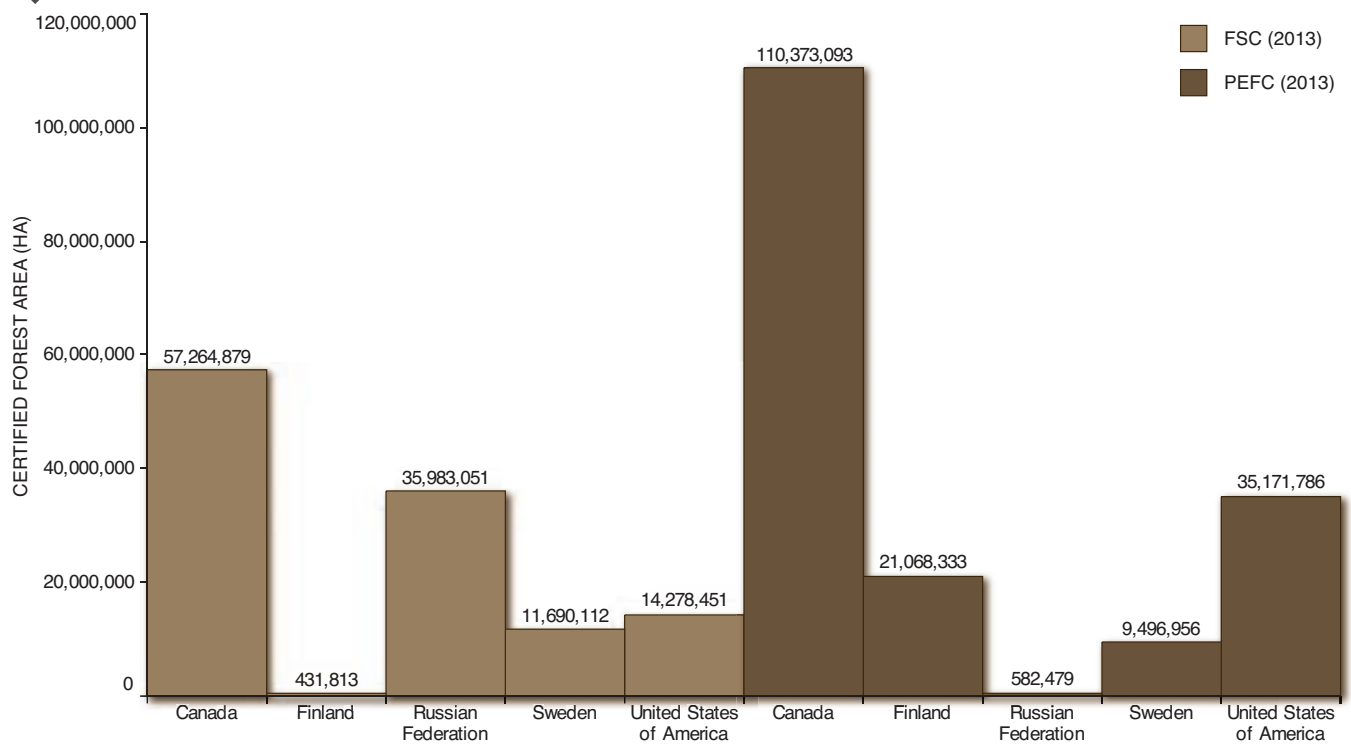




FIGURE 10.2 LEADING COUNTRIES WITH STANDARD-COMPLIANT FOREST AREA, 2012.



Sources: FSC, 2013a; PEFC, 2013c.



TABLE 10.1 STANDARD-COMPLIANT AND CONVENTIONAL KEY STATISTICS FOR FORESTRY PRODUCTION AND TRADE.

## KEY STATISTICS

Top 5 forest product producers (cubic metres; 54% of global)* (2012)	China (14%), United States (13%), Canada (12%), Russia (9%), Brazil (6%)
Top 5 sustainable certified countries (hectares; 71% of global) (2013)	Canada (40%), United States (12%), Russia (9%), Finland (5%), Sweden (5%)
Top 5 forest product exporters (39% of global)** (2012)	Russia (12%), Canada (10%), United States (7%), Germany (5%), New Zealand (5%)
Top 5 forest product importers (44% of global) (2012)	China (20%), United States (9%), Canada (7%), Brazil (5%), Russia (3%)
Major international voluntary sustainability standards	FSC, PEFC
Global production of forest products (2012)	2.2 billion cubic metres
Global exports (2012)	392 million cubic metres (18% of production)
Export value (2012)	US\$233 billion
Global forested area (2011)	4.0 billion hectares
People employed within the forestry sector	14 million
Standard-compliant forest area (2013)	368 million hectares (9.1% of total forested area; 23% of total managed forest area)***
Key sustainability issues	Deforestation, forest degradation, biodiversity loss, destruction of watersheds, soil erosion, climate change
Top 5 countries with decreasing forest cover (number of hectares lost from 2000 to 2011)	Brazil (57 million), Australia (13 million), Indonesia (11 million), Nigeria (9 million), Tanzania (9 million)

Sources: Forest product production data and forest products exporters data: ForesSTAT, 2013; People employed within the forestry sector: FAO, 2011b; Sustainable forestry data: FSC, 2013a; PEFC, 2013c.

\* Includes chips and particles, hardboard, insulating board, medium-density fibreboard, other industrial roundwood, particle board, plywood, pulpwood, round and split Trd, pulpwood and particles, sawlogs and veneer logs, sawn wood, veneer sheets and wood residues. It does not include chemical wood pulp, dissolving wood pulp, mechanical wood pulp, newsprint, other fibre pulp, other paper and paperboard, printing and writing paper, recovered paper, semi-chemical wood pulp and wood charcoal.

\*\* Ibid.

\*\*\* Taking into account a 13 per cent reduction in aggregate (FSC and PEFC) certified area to account for multiple certification.

## 10.1 MARKET REVIEW



### Market reach

Globally, FSC forest area accounts for approximately 4.5 per cent of forest area, while PEFC forest area accounts for approximately 6 per cent (see Figure 10.3 and Table 10.2). Conservatively, we estimate certified forest area after accounting for double certification to be about 9 per cent of total forest area.

### Growth

Certified area grew at an average annual rate of 6 per cent from 2008 to 2013.

### Regional importance

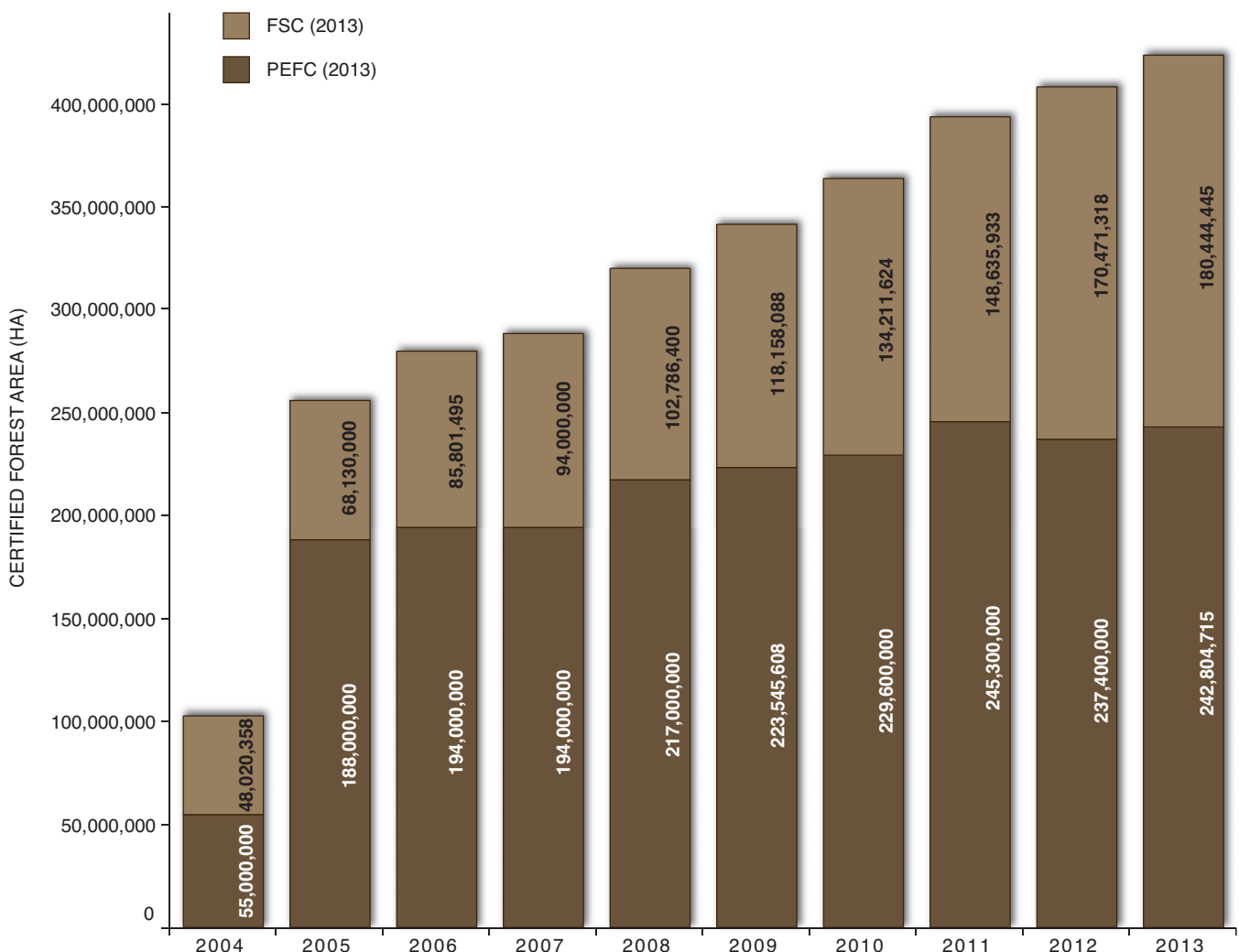
FSC and PEFC certification are present across 80 countries, with a relatively heavier presence in North America and Europe (88 per cent) than in South America and Africa (6 per cent). Canada and the United States are the most important countries by area certified for both initiatives.

### Pricing and premiums

Several recent studies have documented premiums for certified forest products and stumpage fees (see “Pricing and Premiums” section). Generally, it has been found that premiums for certified logs range from 1 to 30 per cent, or more for high quality hardwoods (Kollert & Lagan, 2007; Schreiber, 2012; Yamamoto, Takeuchi & Shinkuma, 2013).

FIGURE 10.3 GROWTH IN FOREST AREA UNDER FSC AND PEFC, 2004–2013.

The large increase from 2004 to 2005 is due to PEFC’s recognition of Sustainable Forest Initiative–compliant forests in 2005. This figure is not adjusted for multiple certification.



Sources: FSC, 2013a; PEFC, 2013c.



## 10.2 MARKET DEVELOPMENT

Forests represent a pillar of innumerable economies and ecosystems. Unsustainable forest management can result in biodiversity reduction, destruction of watersheds, soil erosion and climate change, as well as the degradation or elimination of habitats, not to mention the economies for the estimated 1.8 billion indigenous habitants and other forest people who live in or depend on forests (International Institute for Environment and Development (IIED), 2013).

The causes and relief mechanisms of deforestation and forest degradation are immensely complex. While the extraction of timber and timber products have, historically, been important drivers in deforestation, agriculture currently represents the single most important driver of deforestation globally, being responsible for 80 per cent of global deforestation (48 per cent due to subsistence farming and 32 per cent due to commercial agriculture) (IIED, 2013). Agriculture's pressure on forests is closely linked to population growth and changing consumption habits in developing countries. Compounding factors include corruption related to forest concession grants, unsustainable national land use strategies and lack of enforcement of forest laws, among others. Between 1996 and 2010, over 100 million hectares, or approximately 2.5 per cent of the world's current forested area, was almost entirely deforested in tropical climate zones (FAO, 2012b).

Deforestation and forest degradation are thus largely intertwined with demand for food, population growth, developing economies in the global South, national legislation, trade laws, policy initiatives, and law enforcement, as well as shifting trends in consumer demand in certain markets. Specific attention to the roles and responsibilities of manufacturers and consumers grew out of NGO campaigns in the 1980s. For example, a 1987 Friends of the Earth campaign in the United Kingdom is credited with generating corporate interest in building sustainable forest management supply chains (Synnott, 2005). As media coverage of the sustainable forest management grew, retailers increasingly began searching for ways to prove sustainable management of the forests they sourced from. Arising nearly in tandem with Friends of the Earth UK, the Ecological Trading Company and the Woodworkers Alliance for Rainforest Protection were some of the first organizations to promote trade as an instrument for implementing sustainable forest management and were precursors to the development of forest certification (Synnott, 2005).

The UN Conference on Environment and Development (UNCED) process also provided a major catalyst for private forest certification, culminating in the negotiation of the now widely accepted UNCED Forest Principles (UNCED, 1992). The Forest Principles provided a platform for the development of post-UNCED forest management strategies at the regional and international levels. Within this context, several post-UNCED initiatives are particularly noteworthy:

- 1992: Publication of the International Tropical Timber Organization Guidelines on the Sustainable Management of Natural Tropical Forests, setting out an internationally agreed-upon set of principles for the sustainable management of tropical forests (International Tropical Timber Organization, 1992).
- 1992–1993: Led by the WWF, several NGOs and forest sector members negotiated the establishment of the first global sustainable forest management certification scheme under the auspices of the FSC. The FSC provided the first multistakeholder, market-based approach to promoting sustainable forest management.
- 1993–1994: Development of the Pan-European Operational Level Guidelines for Sustainable Forest Management, a set of principles and guidelines building from the UNCED principles and applicable to the European context.
- 1999: The Pan European Forest Certification Council was formed, utilizing the above-mentioned guidelines as mandatory requirements for sustainable forest management certification. In 2003, it widened its scope to become a global VSS under the name Programme for the Endorsement of Forest Certification (PEFC).
- 2003: Establishment of the Forest Law Enforcement, Governance and Trade Action Plan, a pan-European timber licensing system designed to eliminate illegal sources of forest products from European markets through the development of voluntary partnership agreements with exporting countries (European Forest Institute, 2012).
- 2007–2010: At the 13th session of the conference of parties at the UN Framework Convention on Climate Change, the parties agreed to pursue a process for directing payments to nations to avoid deforestation and land degradation. At the 16th session, the parties agreed to formally establish a fund to finance activities in developing countries.
- 2008: Amendment to U.S. Lacey Act prohibiting the trade of illegally harvested timber on the U.S. market. The amendment states that it is the duty of the government to provide proof of illegality (Lacey Act Amendment, 2008).
- 2009: The European Union Renewable Energy Directive mandated that imported biofuels and feedstock be imported from renewable sources (European Union, 2009).
- 2010–2013: The European Union Timber Regulation was established as part of the EU Forest Law Enforcement, Governance and Trade Action Plan to formally prohibit the placement of illegally harvested timber on the EU market and require that traders keep records on suppliers and customers. The regulation was published in 2010 and is applicable from March 2013 onward (European Union, 2010).

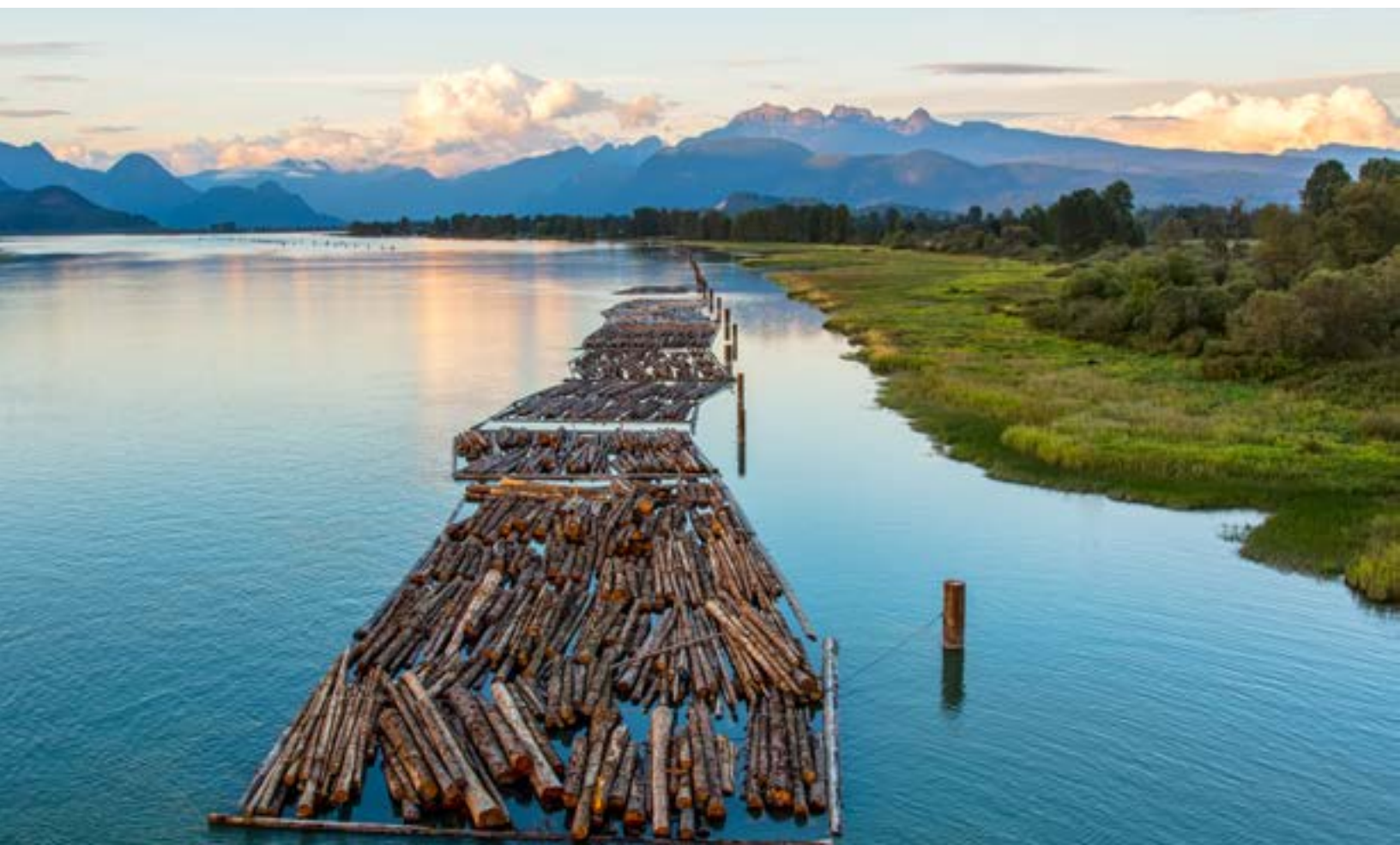


**BOX 10.1 A BRIEF HISTORY OF MAJOR SOURCING COMMITMENTS IN THE FORESTRY SECTOR**

- 1999: Home Depot adopts wood sourcing policy giving preference to wood from certified sources.
- 2000: Lowes announces policy to give preference to FSC certified wood products in its sourcing.
- 2001: B&Q refuses to purchase non-FSC certified lumber from Canadian sources.
- 2003: Domtar makes commitment to supply 100 per cent from FSC certified sources.
- 2004: Greenpeace launches campaign against Kimberly-Clark to promote sustainable forest management in boreal forests.
- 2007: Harry Potter and the Deathly Hallows printed on FSC certified paper, representing the largest single FSC paper order (valued at \$20 million).
- 2009: Kimberly-Clark Professional commits to sourcing 40 per cent FSC certified and recycled wood fibre by 2011.
- 2011: Home Depot commits to sourcing 100 per cent of framing lumber as FSC certified in its San Francisco Bay area stores.
- 2012: The 2012 London Olympic Park development achieves project certification from both FSC and PEFC for its timber usage; three-quarters of the timber used is FSC certified.
- 2012: IKEA aims to source 50 per cent of its wood material (10 million cubic metres, projected) from recycled wood or from FSC certified forests by 2017.

Although initially perceived as a niche market, forest certification has entered into mainstream channels over the past decade. The certification of the 2012 London Olympic Park under both FSC and PEFC Chain of Custody (CoC) standards is one of many examples of this trend. Over the past five years, the certified area under the two leading global schemes—FSC and PEFC—has grown at an average annual rate of 6 per cent. As of 2013, a conservatively estimated 9 per cent of global forested area (368 million hectares) had been certified under either the FSC criteria, PEFC criteria, or both.<sup>4</sup> Of the 1.6 billion hectares of managed forests, sustainably managed forests under FSC and PEFC account for 23 per cent.

4 As with other commodity sectors where more than one certification system is in operation, there is the potential for double certification. There are virtually no data on the actual levels of double certification among forestry producers. Globally, we estimate that between 319.5 million (7.9 per cent) and 423.2 (10.5 per cent) million forestry hectares are certified sustainable. We estimate the total certified area, adjusting for multiple certification, to be somewhere between these two, in the range of 368 million hectares (9.1 per cent of total forested area and 23 per cent of managed forests, globally). Note also that the 2010 edition of the SSI reported a straight sum of the certified area without any downward adjustment for double certification, thus reporting the maximum value in the range (Potts et al., 2010).



Historically, growth in certification has largely been driven by several factors<sup>5</sup>:

- NGO media campaigns raising awareness about unsustainable forest management and aiding corporations in sourcing from sustainable supply chains (e.g., The Forest Trust, WWF's Global Forest and Trade Network, Friends of the Earth UK).
- Commitments from the private sector (see Box 10.1).
- Green public procurement policies (e.g., EU Green Public Procurement).
- Green building initiatives<sup>6</sup> (e.g., LEED and BREEAM).
- Illegal logging legislation, notably the Lacey Act and the European Union Timber Regulation, both mentioned earlier in this section. Both FSC and PEFC address local laws pertaining to sourcing and processing of timber and have made special efforts to facilitate compliance with legal timber sourcing legislation in North America and Europe.<sup>7</sup>

5 FSC (2012b) notes in its Global Market Survey that the drivers of its particular market include increased environmental awareness of end consumers (21 per cent of respondents), FSC certification as a competitive advantage (21 per cent), requirements for corporate social responsibility (14 per cent), actors other than end users requiring certification (11 per cent) and consumer demand for any label (9 per cent). Notably, public procurement policies, legislation and the green building movement received only 6 per cent, 5 per cent and 4 per cent of respondents' votes, respectively. While the specific wording of the FSC and FAO product review demand drivers differ, they both point to the same drivers. The leading FSC demand drivers like "certification as a competitive advantage" and "actors other than end users requiring certification" resemble drivers like "company commitments," "green public procurement policies," "green building initiatives" and "legislation," all of which were outlined by FAO in its Forest Products Annual Market Review (FAO, 2010a).

6 In 2012 green building accounted for 44 per cent of all commercial and institutional construction in the United States and was worth around US\$100 billion. This market share is expected to grow to 55 per cent by 2016 (U.S. Green Building Council, 2013).

7 For more information on how standards interact with the European Union Timber Regulation, see PEFC (2013d) and FSC (2013b); see question 3 of FSC (2013b) for more information on how FSC helps companies in implementing the due diligence required by the European Union Timber Regulation.

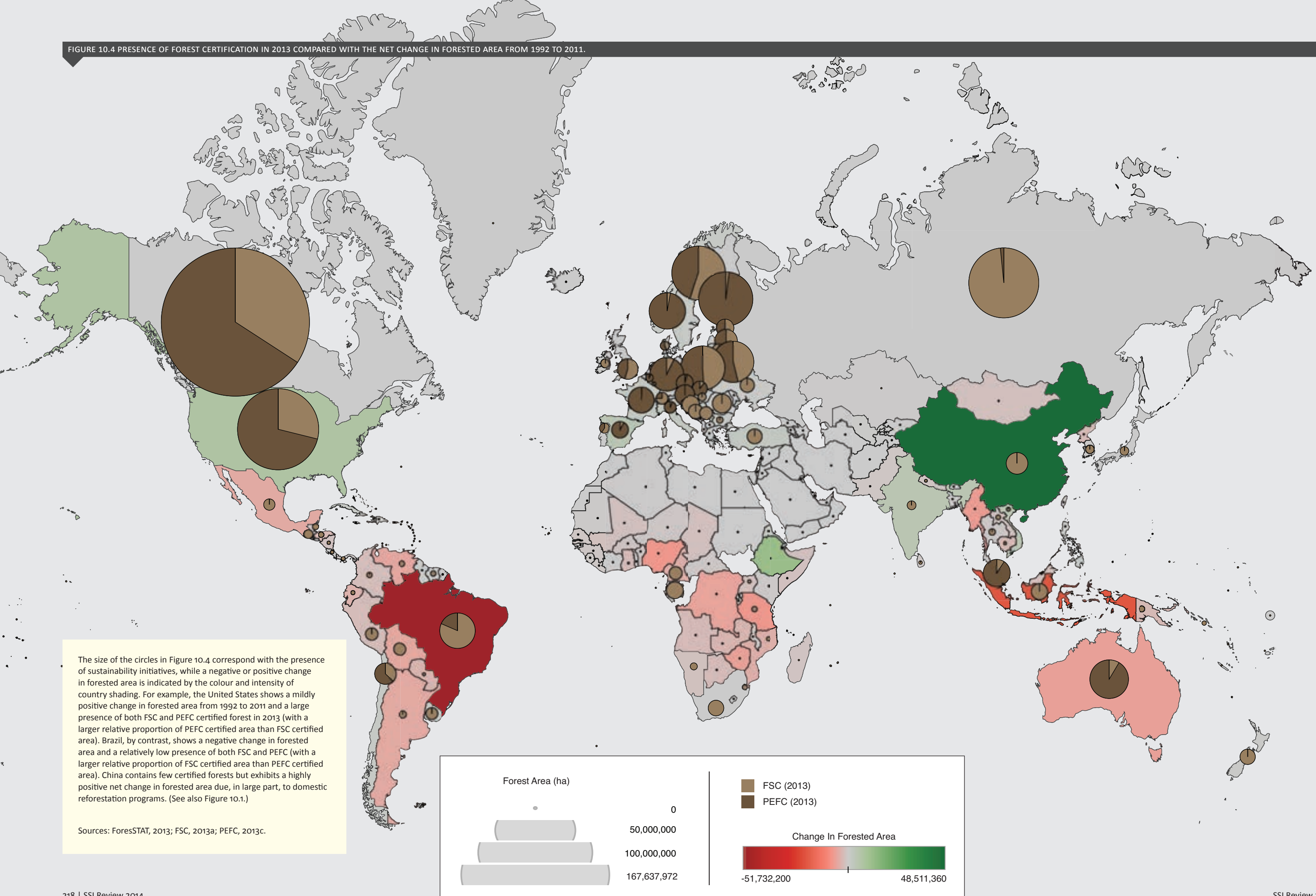
Certified area has grown from an adjusted total of 297 million hectares in 2009 to 368 million hectares by mid-2013, corresponding to an average annual growth rate of 6 per cent.<sup>8</sup> Growth in forest certification has not been consistent in all areas of the world, however. Although almost all deforestation and illegal logging over the last three decades has occurred in tropical forests, only 3 countries in the top 15 certified by PEFC and FSC (Australia, Brazil and Malaysia) contain tropical forest (see Figure 10.4). Notably, Brazil had the most significant negative change in forested cover of any country from 1992 to 2011 (see Figure 10.11), and was 57th in terms of market penetration for sustainable forestry in 2013.

Forest certification continues to be disproportionately concentrated in northern developed economies. Notably, Europe and North America account for 88 per cent of certified forests but constitute only 34 per cent of the world's total forested area. Africa and South America, by contrast, contain 2 per cent and 4 per cent of certified forests but represent 17 per cent and 21 per cent of the world's forested area, respectively. The concentration of certification is even more pronounced within the context of roundwood production, with 96 per cent of all certified roundwood produced in Western Europe and North America in 2012 but both regions accounting for a combined total of 50 per cent of global roundwood production over the same period (see Figure 10.12; a similar scenario exists with respect to pulp for paper production—see Figure 10.13) (Fernholz & Kraxner, 2012). One factor explaining some of the reasons behind this difference in distribution includes difficulties relating to the specific characteristics of tropical sustainable forest management (e.g., political instability, limited resources for implementation, and land ownership arrangements) (FAO, 1999, sections 3.2.3 and 3.4.4). Secondly, the sustainable forestry sector is unique in that a high level of certified product consumed is also produced domestically in the relevant eco-sensitive markets (see Ebeling & Yasué, 2008, p. 2) in Western Europe, the United States and Japan (this is not the case for coffee, cocoa or bananas, for example). However, because channels for certified tropical timber markets are often completely separate from certified temperate and boreal markets (benefiting tropical producers by avoiding competition with North American and European certified wood), their development also implies the development of additional networks and supply chain implementation infrastructure and strategies (e.g., additional transaction costs).

8 These figures have been adjusted for double certification. The absolute aggregate figures for PEFC and FSC are 368 million hectares (2009) and 423 million hectares (2013).



FIGURE 10.4 PRESENCE OF FOREST CERTIFICATION IN 2013 COMPARED WITH THE NET CHANGE IN FORESTED AREA FROM 1992 TO 2011.



## 10.3 MARKET PERFORMANCE

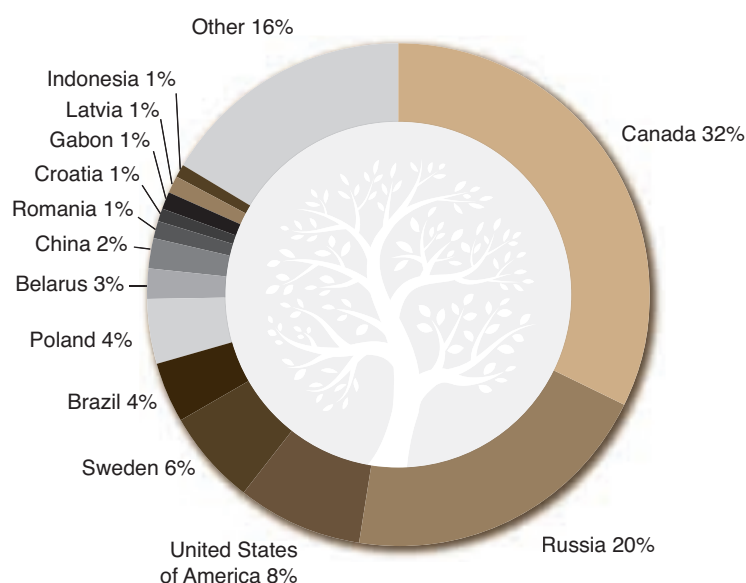


TABLE 10.2 IMPORTANCE OF CERTIFIED AREA AND ROUNDWOOD PRODUCTION, RELATIVE TO GLOBAL FIGURES.

	VSS certified area (ha)	VSS certified area as a percentage of global area	Potential supply of VSS certified industrial roundwood (m³)	Potential supply of certified industrial roundwood, market share of global exports	VSS potential industrial roundwood supply, market share of global production
<b>FSC</b>	180,444,445	5%	no data	n/a	n/a
<b>PEFC</b>	242,804,715	6%	no data	n/a	n/a
<b>Global VSS certified area (ha) and potential supply (m³, %), adjusted for multiple certification</b>	368,000,000	9%	469,000,000	419%	28%

Source: Fernholz & Kraxner, 2012; FSC, 2013a; PEFC, 2013b.

FIGURE 10.5 FSC FORESTED AREA BY COUNTRY, JULY 2013.



Source: FSC, 2013a.

### Forest Stewardship Council (FSC)

Established in 1993, FSC was the first global system of forest certification and is currently the fastest-growing global forestry certification initiative. FSC implements CoC and forest management standards, the latter of which consist of a system of national standards developed in accordance with FSC's global principles and criteria.

On the supply side, as of July 2013, FSC had certified 180 million hectares across 80 countries (see Figure 10.14 for countries with the largest areas of certification) and 4 continents (see Figure 10.15). During the five years since 2009, forested area under FSC has grown at a relatively constant rate of 15.5 million hectares per year, equivalent to an average annual growth rate of 11 per cent (see Table 10.4). Canada, Russia, the United States and Sweden account for 66 per cent of total FSC certified area (120 million hectares). Canada alone represents about one-third of total FSC certified area, while Russia represents about one-fifth (see Figure 10.5 and Table 10.3). By continent, forested area certified under FSC is concentrated in Europe (43 per cent), North America (40 per cent), South America (7 per cent), Asia (5 per cent), Africa (4 per cent), Oceania (1 per cent) and the Caribbean (1 per cent). While FSC has achieved particular success in North American and European countries, FSC coverage is significantly less in tropical regions. Nevertheless, FSC has succeeded in certifying 1 per cent or more of total forested area in certain countries containing tropical forest, including China, Brazil, Indonesia, Gabon, South Africa and New Zealand.

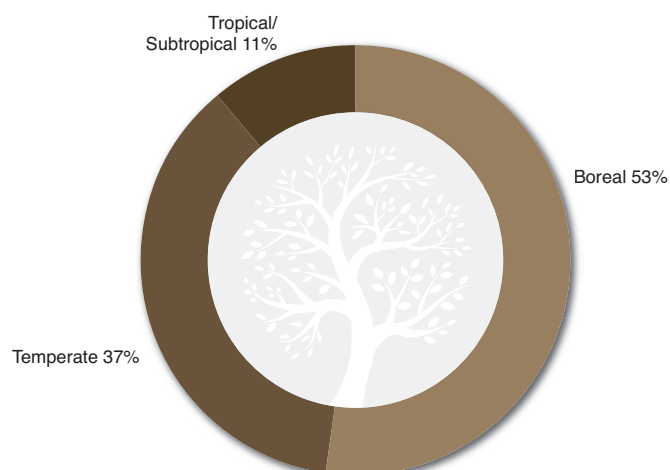
The concentration of certification in the temperate and boreal forests of North America and Europe is illustrated in FSC's 2012 certification breakdown by biome: 90 per cent of FSC certified area was concentrated in boreal (53 per cent) and temperate forests (37 per cent), with tropical forests accounting for only 11 per cent

of total certified area (see Figure 10.6).<sup>9</sup> FSC's total certified area is primarily supplied by natural forests (65 per cent), followed by semi-natural and mixed plantation and natural forest sources (28 per cent), and plantation forests (8 per cent) (see Figure 10.7).

Notwithstanding the overall challenges faced in securing tropical certification, growth in certified area under FSC continues in both tropical and temperate forests. The majority of growth in certified area in 2012 came from the Asia-Pacific region, where the area of FSC certified forests grew by 30 per cent and the number of CoC certificates grew by 20 per cent (FSC, 2012a). During 2012, over 9 million hectares of forest were certified in 16 different countries, driving the growth of the global FSC supply chain. In Canada, certification saw a rapid increase of 175 per cent from 2008 to 2013, driven in part by campaigns to safeguard the rights of First Nations and local communities (FSC, 2012a). The FSC's *Global Market Survey* found that 98 per cent of FSC's certification holders were planning to renew or keep their certification, and 54.5 per cent of respondents indicated they were already planning to source more FSC certified materials than they did in 2011 (FSC, 2012b). This was particularly the case for companies in South America, Central America and Africa.

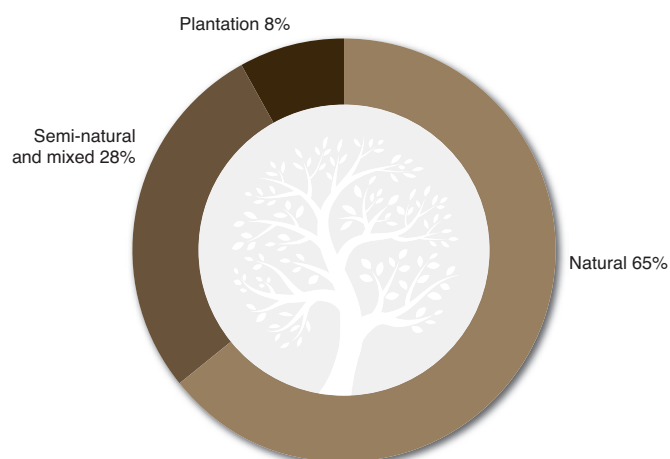
9 Note that tropical forest area accounts for 47 per cent of global forested area (FAO, 1993).

FIGURE 10.6 FSC FORESTED AREA BY BIOME, JULY 2013.



Source: FSC, 2013a.

FIGURE 10.7 FSC FORESTED AREA BY FOREST TYPE, JULY 2013.



Source: FSC, 2013a.



TABLE 10.3 FSC FORESTED AREA AND COC CERTIFICATES BY COUNTRY, 2013.

	Forested area (ha)	CoC certificates
Canada	57,264,879	980
Russian Federation	35,983,051	222
United States	14,278,451	3,375
Sweden	11,690,112	278
Brazil	7,299,232	976
Poland	6,998,809	946
Belarus	5,735,508	21
China	3,146,305	3,058
Romania	2,386,942	147
Croatia	2,038,296	190
Gabon	1,873,505	9
Latvia	1,740,297	201
Indonesia	1,679,117	192
Democratic Republic of Congo	1,574,310	2
United Kingdom	1,570,272	2,341
South Africa	1,544,885	103
New Zealand	1,487,489	151
Turkey	1,380,123	133
Bosnia and Herzegovina	1,289,151	189
Ukraine	1,236,805	44

Source: FSC, 2013a.

TABLE 10.4 FSC FORESTED AREA, 2004–2013.

	Forested area (ha)
2004	48,020,358
2005	68,130,000
2006	85,801,495
2007	94,000,000
2008	102,786,400
2009	118,158,088
2010	134,211,624
2011	148,635,933
2012	170,471,318
2013	180,444,445

Source: FSC, 2013a.

### Programme for the Endorsement of Forest Certification (PEFC)

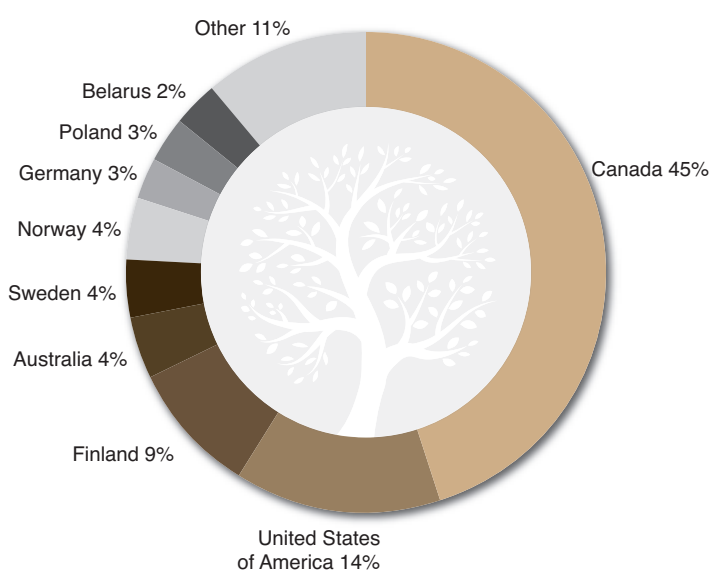
PEFC, established in 1999,<sup>10</sup> operates as an umbrella organization recognizing existing national forest certification systems that comply with PEFC's sustainability benchmark criteria. PEFC is the global leader in terms of total area certified, with 243 million hectares across 27 countries (see Figure 10.14 for countries with the largest areas of certification) in 4 continents (see Figure 10.15). As with FSC, PEFC certified area is also concentrated in temperate and boreal forests, although to a larger degree. The distribution of PEFC certified products is attributed to its reliance on independent national standards for PEFC recognition. PEFC's bottom-up approach to standards development results in a resource-intensive and complex process that has restricted the speed with which it can move into new countries where standard-setting capacity itself is limited.<sup>11</sup> Nevertheless, PEFC has recently made specific efforts to bring tropical sources into its supply stream, with notable success in Malaysia, Chile, China and Indonesia. Among other countries, Myanmar and India have indicated their interest in developing PEFC-compliant certification systems (T. Arndt, PEFC, personal communication, December 10, 2013).

In 2005, PEFC endorsed all Sustainable Forestry Initiative (SFI) forests,<sup>12</sup> resulting in a major one-time increase and more than tripling its area under certification at the time. PEFC has also certified the American Tree Farm System and the Canadian Standards Association, which currently account for nearly 60 per cent of its certified area.<sup>13</sup> Total hectares certified have been relatively stable, around 240 million hectares between 2011 and 2013. During the past five years (from 2009 to mid-2013), certified area under PEFC has grown at an average annual rate of 2 per cent per year (see Table 10.6).

As of June 2013, three countries accounted for approximately 68 per cent of total PEFC certified area: Canada (45 per cent), the

United States (14 per cent) and Finland (9 per cent); see Figure 10.8. At the regional level, North America and Europe account for 93 per cent of total certified area (60 per cent and 33 per cent, respectively). South America (1 per cent), Asia (2 per cent) and Oceania (4 per cent) account for the remainder of certified area. In terms of intensity of sustainable certification, PEFC has notable presence in countries such as Chile (with 12 per cent of total forested area PEFC certified) and Malaysia (22 per cent PEFC certified). CoC certificates have grown five-fold since 2004. Germany, France and the United Kingdom are the countries with the most CoC certificates (Table 10.5).

FIGURE 10.8 PEFC FORESTED AREA BY COUNTRY, JUNE 2013.



Source: PEFC, 2013c.

<sup>10</sup> The PEFC was originally established as the Pan-European Forest Certification system and was designed to facilitate sustainable forest management across the European community. Subsequently, the organization changed its name to the Programme for the Endorsement of Forest Certification so that it could address a more global clientele.

<sup>11</sup> PEFC's approach is based on the belief that standard setting must take place at the local level to ensure utmost consideration of local conditions. From a historical context, this allowed the standard to address the multiplicity of national certification initiatives in the European context (Belgian Development Cooperation, 2013).

<sup>12</sup> The SFI is a forest certification scheme launched in 1994, currently operating in North America (SFI, n.d.). More than 100 million hectares of land across the United States and Canada were certified under the SFI standard by 2013; at these volumes, forest area certified under the initiative represents over 40 per cent of PEFC certified area.

<sup>13</sup> Based on 109 million hectares certified in North America by the American Tree Farm System and the Canadian Standards Association (PEFC, 2013b).

TABLE 10.5 PEFC FORESTED AREA AND COC CERTIFICATES BY COUNTRY, 2013.

	Forested area (ha)	CoC certificates
Canada	110,373,093	186
United States	35,171,786	319
Finland	21,068,333	182
Australia	9,800,877	245
Sweden	9,496,956	126
Norway	9,125,902	44
Germany	7,384,800	1,546
Poland	7,304,356	69
Belarus	6,670,700	26
France	4,637,851	2,056
Malaysia	4,566,376	236
Austria	2,698,433	419
Chile	1,913,521	54
Czech Republic	1,845,321	159
Latvia	1,683,641	26
Brazil	1,658,583	46
Spain	1,618,365	638
United Kingdom	1,298,047	1,160
Slovakia	1,233,364	47
Estonia	897,688	26

Source: PEFC, 2013c.

TABLE 10.6 PEFC FORESTED AREA AND COC CERTIFICATES, 2004–2013.

	Forested area (ha)	CoC certificates
2004	55,000,000	1,905
2005	188,000,000	2,362
2006	194,000,000	2,901
2007	194,000,000	3,545
2008	217,000,000	4,420
2009	223,545,608	6,166
2010	229,600,000	7,688
2011	245,300,000	8,797
2012	237,400,000	9,529
2013	242,804,715	9,807

Source: PEFC, 2013c.





## 10.4 SUPPLY

The world's top 25 countries, in terms of total forested area, represent 82.5 per cent of the world's forest surface area. Russia, Brazil, Canada, the United States and China are the five largest countries by forest area and represent about half of the world's forest cover (see Figure 10.10); however, whereas FSC and PEFC have significantly penetrated the Canadian and U.S. forestry sectors, sustainability intensity rates in Russia, Brazil and China have remained relatively low. The FSC certifies 4.4 per cent, 1.4 per cent and 1.5 per cent, respectively, of Russian, Brazilian and Chinese forestry, while PEFC's certified area in these countries is between 0 per cent and 0.3 per cent (PEFC forest certification endorsed China in February, 2014). Since Russia, Brazil and China represent about 38 per cent of the world's forested area, the relatively low sustainability intensity of these countries represents an important opportunity for expansion. The link between such regions and illegal forestry practices and deforestation also renders them important target countries from a sustainability perspective.

Forest certification also continues to face challenges in addressing global deforestation. The countries with the highest changes in net forest area also tend to exhibit the lowest uptake for certification. For example, Brazil, the leading country in terms of annual net forest loss, ranked 57th with regard to sustainability intensity, with 1.6 per cent of its forest area certified. Similarly, Australia (second in annual net forest loss) ranked 44th, with 6.9 per cent certified, and Indonesia (third in annual net forest loss) ranked 52nd, with 1.8 per cent certified. As of 2012, Nigeria (fifth in annual net forest loss) had no certified area and Tanzania (sixth in annual net forest loss) ranked 73rd, with 0.3 per cent certified. It stands to reason that countries with high proportions of certified area would have less negative net change in forested area than those who don't. However, deforestation occurs almost exclusively in tropical forests, which—in the context of building a supply base for compliant forest products—face the above-mentioned difficulties relating to the specific characteristics of tropical sustainable forest management

(e.g., political instability, limited resources for implementation and land ownership arrangements) (FAO, 1999, sections 3.2.3 and 3.4.4).

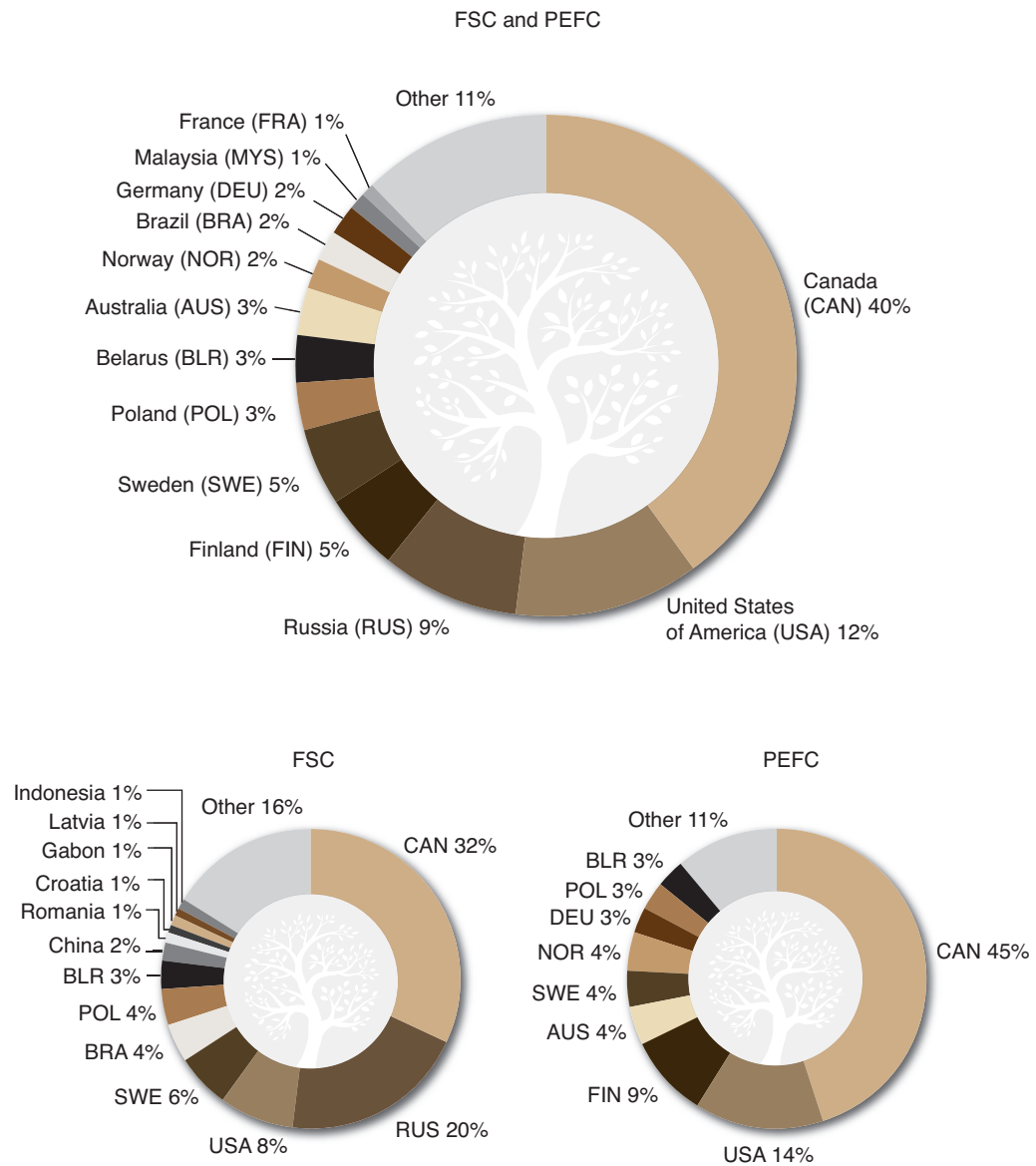
Although PEFC has higher global area of certified forest, FSC has a broader distribution base for its supply. For example, PEFC certification is present in 6 of the top 25 most forested countries, while FSC certification is present in 19 of these countries (see Figure 10.9 and Table 10.7). Of these countries, Sweden, which occupies the 23rd rank by forested area (hectares), has the highest sustainability intensity rate, with 41 per cent of forestry land area being certified FSC and 34 per cent being certified PEFC. Whereas Australia benefits from 7 per cent PEFC certification, all other countries have a sustainability intensity that is smaller than 2 per cent; however, countries like Finland, Germany, Norway, Poland, Belarus, Austria, Latvia, the United Kingdom, Czech Republic and Slovakia, which have smaller forestry sectors, have PEFC penetration rates higher than 50 per cent. As of 2013, FSC certified over 50 per cent of forestry area in Germany, Poland, Belarus, Latvia, United Kingdom, Croatia and Ireland (see Table 10.7).

Globally, we estimate that between 319.5 million (7.9 per cent) and 423.2 million (10.5 per cent) forestry hectares are certified sustainable.<sup>14</sup> We estimate the total certified area, adjusting for multiple certification, to be somewhere between these two, in the range of 368 million hectares (9.1 per cent of total forested area and 23 per cent of managed forests, globally).<sup>15</sup>

14 This range is generated by an assumption of maximum double certification across PEFC and FSC where operating in the same country, which produces the minimum value in the range (319 million hectares) and no double certification (the maximum value in the range is 423 million hectares).

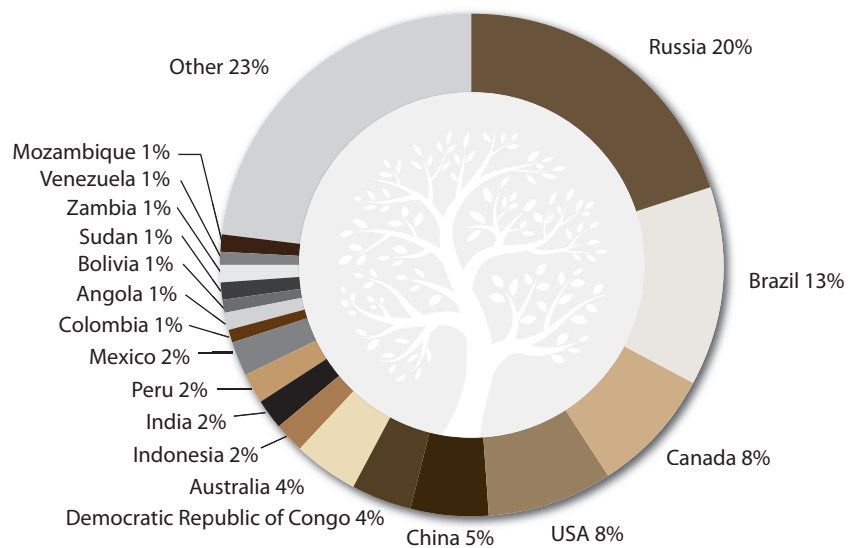
15 We have calculated double certification as the median between the minimum and maximum in our possible range of sustainable production (see above).

FIGURE 10.9 FSC AND PEFC FORESTED AREA BY COUNTRY, 2013.



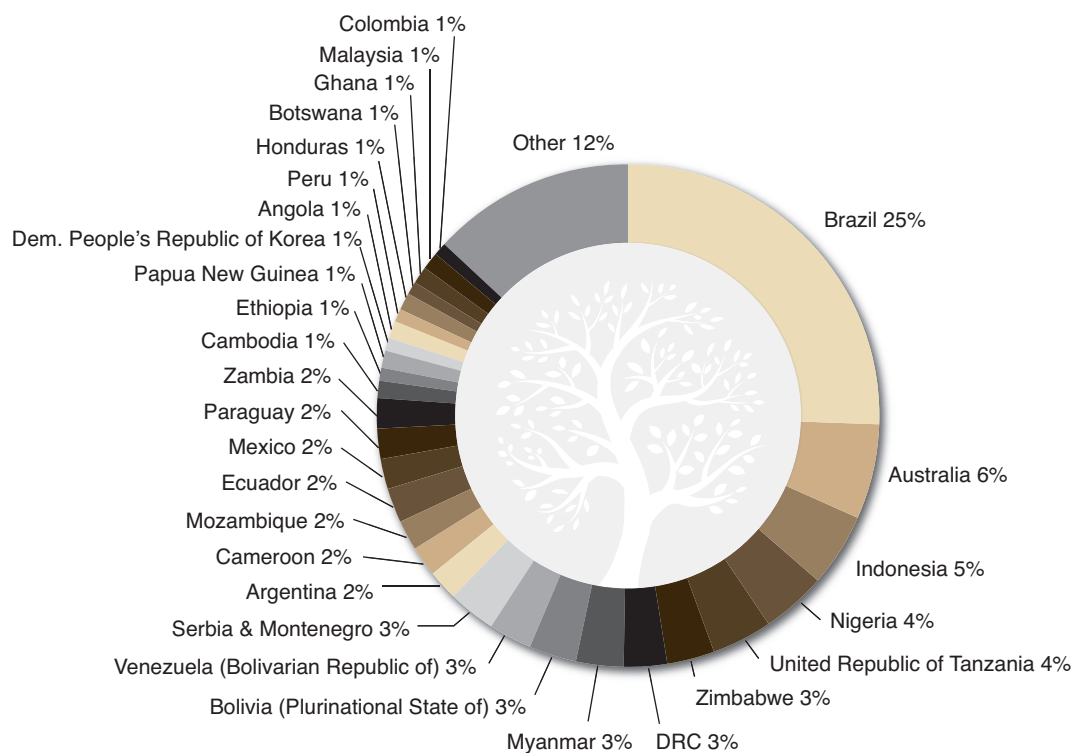
Sources: FSC, 2013a; PEFC, 2013c.

FIGURE 10.10 FORESTED AREA GLOBALLY, 2012.



Source: ForesSTAT, 2013.

FIGURE 10.11 NEGATIVE CHANGE IN GLOBAL FORESTED AREA, 2000–2011.



Source: ForesSTAT, 2013.



FIGURE 10.12 ROUNDWOOD PRODUCTION BY COUNTRY, 2012.

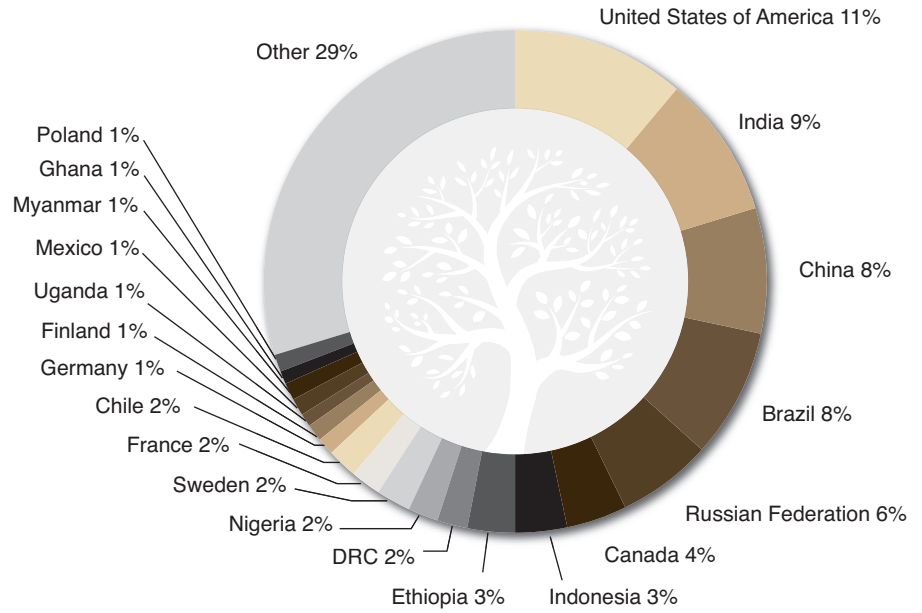


FIGURE 10.13 PULP FOR PAPER PRODUCTION, 2012.

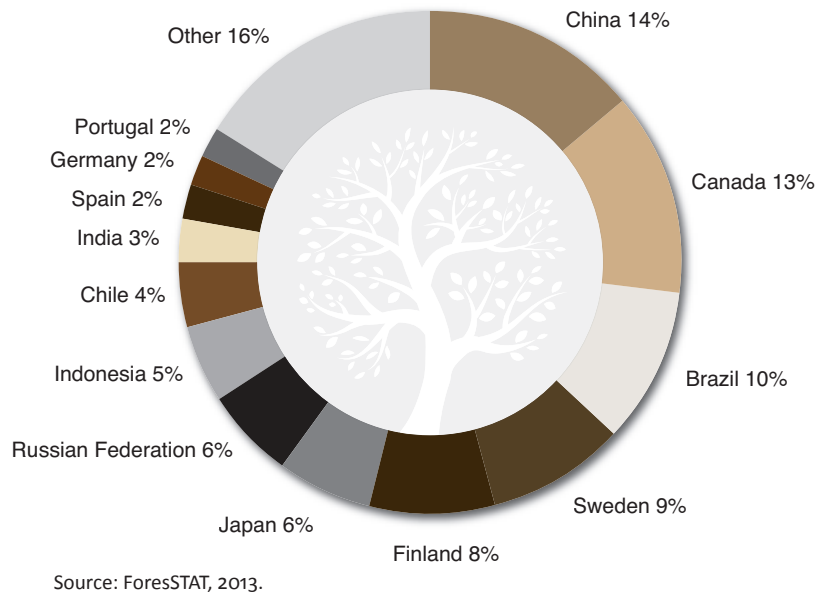


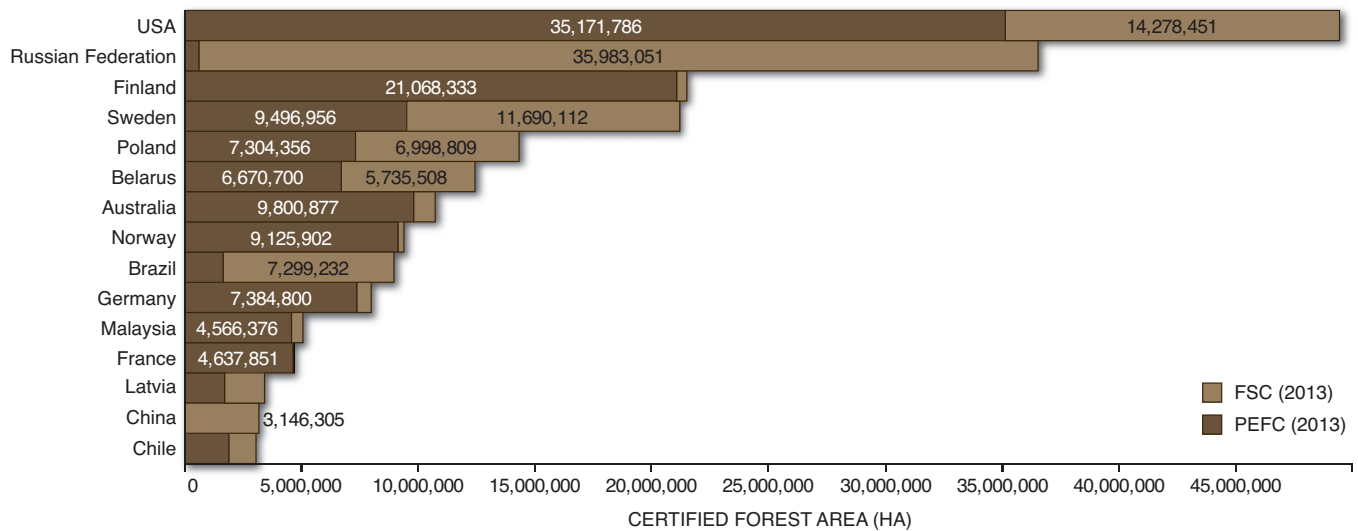
TABLE 10.7 STANDARD-COMPLIANT FORESTED AREA.

As a percentage of total national forested area for 40 most forested countries, 2013. Dashes represent negligible or no standard-compliant forested area relative to national forested area.

	FSC	PEFC
<b>Russian Federation</b>	4.4%	0.1%
<b>Brazil</b>	1.4%	0.3%
<b>Canada</b>	18.5%	35.6%
<b>United States</b>	4.7%	11.6%
<b>China</b>	1.5%	-
<b>Democratic Republic of Congo</b>	-	-
<b>Australia</b>	0.6%	6.6%
<b>Indonesia</b>	1.8%	-
<b>India</b>	0.6%	-
<b>Peru</b>	1.3%	-
<b>Mexico</b>	1.2%	-
<b>Colombia</b>	0.2%	-
<b>Angola</b>	-	-
<b>Bolivia (Plurinational State of)</b>	1.6%	-
<b>Sudan</b>	-	-
<b>Zambia</b>	-	-
<b>Venezuela (Bolivarian Republic of)</b>	0.3%	-
<b>Mozambique</b>	0.1%	-
<b>United Republic of Tanzania</b>	0.3%	-
<b>Myanmar</b>	-	-
<b>Argentina</b>	0.9%	-
<b>Papua New Guinea</b>	0.6%	-
<b>Sweden</b>	41.4%	33.7%
<b>Japan</b>	1.6%	-
<b>Central African Republic</b>	-	-
<b>Finland</b>	1.9%	95.1%
<b>Germany</b>	5.2%	66.7%
<b>Norway</b>	2.6%	90.0%
<b>Poland</b>	74.7%	78.0%
<b>Belarus</b>	66.2%	77.0%
<b>Austria</b>	-	69.3%
<b>Latvia</b>	51.7%	50.0%
<b>United Kingdom</b>	54.4%	44.9%
<b>Czech Republic</b>	1.9%	69.4%
<b>Estonia</b>	51.6%	40.6%
<b>Lithuania</b>	48.8%	-
<b>Slovakia</b>	7.5%	63.8%
<b>Croatia</b>	100.0%	-
<b>Ireland</b>	59.6%	-
<b>Denmark</b>	36.4%	46.6%

Sources: ForesSTAT, 2013; FSC, 2013a; PEFC, 2013c.

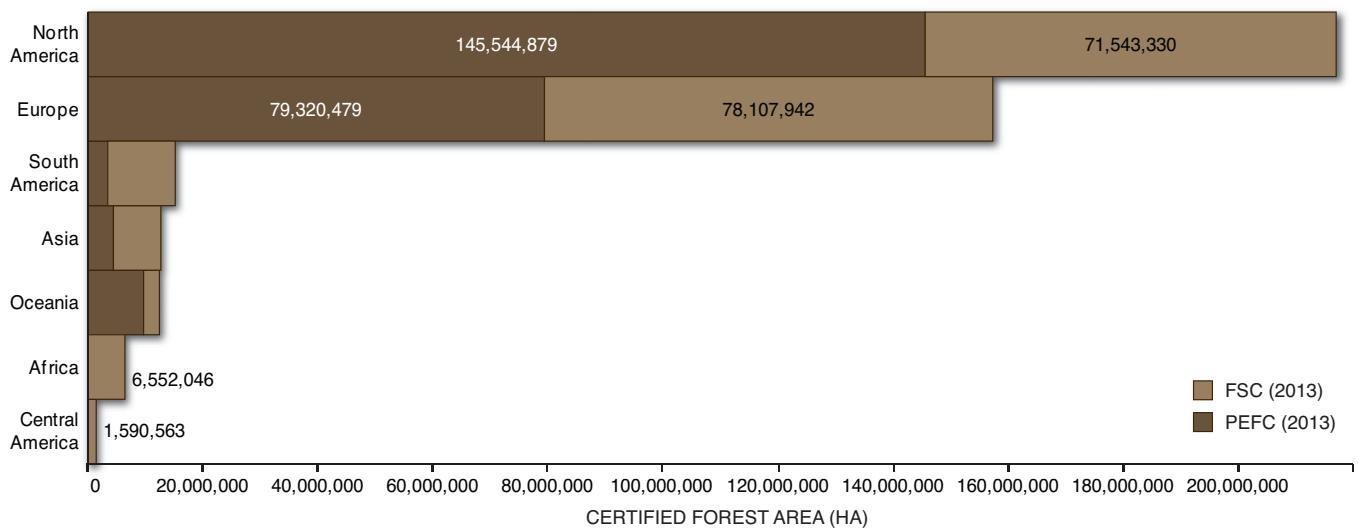
FIGURE 10.14 COUNTRIES WITH THE MOST CERTIFIED FOREST, 2013.



Where space permits, data points are visible.

Sources: FSC, 2013a; PEFC, 2013c.

FIGURE 10.15 FSC AND PEFC FORESTED AREA BY CONTINENT, 2013.



Where space permits, data points are visible.

Sources: FSC, 2013a; PEFC, 2013d.



## 10.5 PRICING AND PREMIUMS



Prices and premiums paid for FSC and PEFC certified products or stumpage fees are market driven and are inconsistent across products or countries. In the mid-1990s, early on in the history of forest certification, several studies looked at pricing within certified markets and claimed that consumers in Europe and North America were willing to pay premiums of between 2 per cent and 30 per cent (Kollert & Lagan, 2007). More recently, several studies have corroborated these estimates:

Kollert and Lagan (2007) looked at the price premiums for FSC certified logs in Malaysia and found average premiums of between 2 per cent and 56 per cent. High-quality logs mostly destined for export received premiums of between 27 and 56 per cent, and lower quality logs (for example, light hardwoods used for the production of veneer) between 2 and 30 per cent. In Malaysia, by mid-2013, FSC had certified roughly 500,000 hectares, while PEFC had certified 4.6 million hectares.

Schreiber (2012) found that “Certified wood products receive an overall price premium of 10.5% while the premium for certified stumpage ranges from 1.6-4.3%” (p. 3). The study found that premiums for finished wood products were higher for domestic

sales than for export sales, generating statistically significant premiums of 30 per cent and 3.4 per cent, respectively.

Cai and Aguilar (2013) conducted a meta-analysis of 19 studies of “willingness to pay” premiums associated with forest certification, finding that “frequently purchased wood products and wood products with lower base prices tended to have higher percentage premiums” (p. 15) and that willingness to pay premiums have increased in recent years. Willingness to pay premiums in the 19 studies were found to be between 1 and 39 per cent.

Yamamoto et al. (2013) carried out a study using data from more than 38,000 log transactions in Shizuoka Prefecture, Japan, and found premiums of 1.4 per cent for certified logs. The study used data from logs certified by FSC (1.5 per cent of Japan’s forest at the time of writing) and the domestic forestry certification Sustainable Green Ecosystem Council (3.5 per cent of Japan’s forest area). Of the two international forestry voluntary sustainability initiatives, only FSC is present in Japan. There was a positive and statistically significant effect of certification on prices, but this is at the lower end of what has been found in much of the literature. Higher-quality logs received higher premiums; cedar, for instance, received premiums of 4 per cent.

## 10.6 CHALLENGES AND OPPORTUNITIES



Forest certification has been growing at a constant pace for the past two decades. As companies move forward on existing public commitments and legislation requiring proof of legality comes to bear, we expect this trend to continue for the foreseeable future. Based on current trends, we expect approximately 15 per cent of total forest area to be certified sustainable under PEFC or FSC by 2020. As sustainable forest certification continues on its path of growth, it faces a number of challenges.

The gap between certification in temperate versus tropical forests represents one of the major challenges facing forest certification and is driven by a number of factors, including reduced certification costs due to the pre-existence of forest management plans in temperate forests in Europe and North America,<sup>16</sup> incompatibility between standards and local contexts in some tropical regions, absence of pre-existing national standards, reduced implementation infrastructure, opportunity costs in preserving tropical forests for local commercial or sustenance farmers and, in

some cases, corruption in granting forest concessions (International Tropical Timber Organization, 2002). In addition to the specific difficulties of tropical sustainable forest management (also see FAO, 1999, sections 3.2.3 and 3.4.4), the sustainable forestry sector has the unique arrangement among sustainable commodities of having high levels of certified product consumed and produced within the same country (mostly relevant eco-sensitive markets [see Ebeling & Yasué, 2008, p. 2] in Western Europe, the United States and Japan), which lends itself as a possible added difficulty for tropical producers if they access similar markets as boreal and temperate producers. However, as stated earlier in Section 10.2, because channels for certified tropical timber markets are often completely separate from certified temperate and boreal markets (benefiting tropical producers in one sense), their development also implies the development of additional networks and supply chain implementation infrastructure and strategies (e.g., additional transaction costs).

Increasing certification across tropical forests will likely require systemic changes in economic and political structures in developing countries as well as continued pressure on the demand side specifically targeting such sources. Legislative and procurement initiatives have been and continue to be important drivers in this respect. With sourcing programs only just beginning under the European Union’s Forest Law Enforcement, Governance and Trade

<sup>16</sup> 1.6 billion hectares of the world’s forested area are covered by a forest management plan, 23 per cent of which are certified by FSC or PEFC. In 1990, before either FSC or PEFC were established, Europe already had over 900 million hectares of forest covered under a management plan. South America and Africa, on the other hand, had a combined area of less than 100 million hectares under a forest management plan (FAO, 2010b).

Action Plan and the European Union Timber Regulation, one can expect significant pressures in this direction moving forward; however, investment in capacity at production and enforcement capacity in tropical production regions will also be critical parts of meeting this challenge. Programs like the Forest Trust and WWF's Global Forest Trade Network represent important instruments and will likely need to be scaled up. An expansion of trade-oriented technical assistance and extension services is likely to be an important part of any strategy, bringing a more proportional participation of tropical regions into sustainable forestry supply chains.

Partnerships with industry players, trade associations and other public and private sector representatives in new supply markets is, and will continue to be, a critical part of the expansion strategy for sustainable forest certification. The adoption of sustainable forest management standards requires local ownership and commitment in order to create the requisite infrastructure for entry into global certified markets, and growth strategies will need to focus on building this ownership locally where it doesn't already exist.

Russia, Brazil and China account for more than one-third of global forested area but represent less than 5 per cent of global certified forest product supply. These countries, therefore, constitute important opportunities for market expansion but also for ensuring that forest certification has maximum impact. At present, FSC's market development activities are focused on projects in Japan, Russia and North America and are geared toward raising market awareness of FSC certification, while PEFC is engaged in several

projects, including its Asia Promotions Initiative, which is working to eventually establish PEFC certification within Japan and China.<sup>17</sup>

Private sector commitments also remain a major feature of market growth in the sector. There is no indication at present that sustainable forest certification will become the de facto "price of entry" into mainstream channels. As such, forest certification initiatives and partners will need to remain diligent in making the business case for the adoption of forest certification for new clients.

In doing so, forest certification must likely continue to refine the certification business model. Although the diversity of forest products allows for some degree of market differentiation, and existing studies from various parts of the world suggest that certified logs receive premiums between 2 and 30 per cent or more, a significant portion of the market is fungible and/or incorporated within intermediate products not easily differentiated on the consumer market. Both PEFC and FSC have sought mechanisms for enabling reduced costs where differentiation is neither necessary nor practically feasible.<sup>18</sup> As forest certification grows in importance, it is possible that the broader adoption of certification in undifferentiated markets (mass markets) will drive down both certification costs and market premiums. If this occurs, incentives for the adoption of forest certification at the local level are likely to be driven more by market access and/or soft benefits associated with overall risk reduction and improved management.

<sup>17</sup> PEFC is working with other countries that have shown an interest in developing a PEFC-compliant forest certification system as well, including Myanmar, India, the Philippines, Vietnam, Thailand, Nepal and South Korea. The program currently also supports China and Indonesia, two countries that have already applied for PEFC endorsement (T. Arndt, PEFC, personal communication, December 10, 2013).

<sup>18</sup> In addition to 100 per cent certified labels, both PEFC and FSC offer mixed content or recycled content labels.





## 10.7 REFERENCES

- Belgian Development Cooperation. (2013). *PEFC: First steps in Asia and Africa*.
- Cai, Z., & Aguilar, F. X. (2013). Meta-analysis of consumer's willingness-to-pay premiums for certified wood products. *Journal of Forest Economics*, 19(1), 15–31. doi:<http://dx.doi.org/10.1016/j.jfe.2012.06.007>
- Ebeling, J., & Yasué, M. (2009). The effectiveness of market-based conservation in the tropics: Forest certification in Ecuador and Bolivia. *Journal of Environmental Management*, 90(2), 1145–53. doi:10.1016/j.jenvman.2008.05.003
- European Forest Institute. (2012). FLEGT voluntary partnership agreements. Retrieved from <http://www.euflegt.efi.int/portal/>
- European Union. (2009). Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. *Official Journal of the European Union*. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF>
- European Union. (2010). Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market. *Official Journal of the European Union*. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:295:0023:0034:EN:PDF>
- Fernholz, K., & Kraxner, F. (2012). *UNECE/FAO Forest Products Annual Market Review, 2011–2012*, 107–116.
- Food and Agriculture Organization of the United Nations (FAO). (1993). The world's forests. In *The challenge of sustainable forest management: What future for the world's forests?* Retrieved from <http://www.fao.org/docrep/t0829e/t0829e04.htm>
- Food and Agriculture Organization of the United Nations (FAO). (1997). *Ecotourism and other services derived from forests in the Asia-Pacific region: Outlook to 2010*. Retrieved from <ftp://ftp.fao.org/docrep/fao/W7714E/W7714E00.pdf>
- Food and Agriculture Organization of the United Nations (FAO). (1999). Section 3: A review of the sustainability of forest management practices in tropical countries. *Tropical forest management techniques*. Retrieved from <http://www.fao.org/docrep/003/x4110e/X4110E04.htm>
- Food and Agriculture Organization of the United Nations (FAO). (2010a). *Forest products annual market review 2009–10*. Rome.
- Food and Agriculture Organization of the United Nations (FAO). (2010b). *Global forest resources assessment 2010*. Rome.
- Food and Agriculture Organization of the United Nations (FAO). (2011b). *State of the world's forests 2011*. Rome.
- Food and Agriculture Organization of the United Nations (FAO). (2012b). *State of the world's forests 2012*. Rome.
- ForesSTAT. (2013). *Database on forestry statistics*. Food and Agriculture Organization of the United Nations (FAO). Retrieved from <http://faostat.fao.org/site/626/default.aspx>
- Forest Stewardship Council (FSC). (2012a). *Annual report 2012 – Consolidating gains, strengthening leadership*. Bonn: Forest Stewardship Council.
- Forest Stewardship Council (FSC). (2012b). *Global market survey*. Bonn: Forest Stewardship Council.
- Forest Stewardship Council (FSC). (2013a). *Global FSC certificates: type and distribution*. August.
- Forest Stewardship Council (FSC). (2013b). *Questions & answers about FSC and the EU Timber Regulation*. Retrieved from <https://ic.fsc.org/download.qa-eutr-rev-03-14-13.a-1517.pdf>
- IKEA. (2013b). *People & planet positive IKEA Group sustainability strategy for 2020*. Retrieved from [http://www.ikea.com/ms/en\\_GB/pdf/people\\_planet\\_positive/People\\_planet\\_positive.pdf](http://www.ikea.com/ms/en_GB/pdf/people_planet_positive/People_planet_positive.pdf)
- International Institute for Environment and Development (IIED). (2013). *Reducing 'forest footprints': tackling demand for forest-risk commodities*. Retrieved from <http://pubs.iied.org/pdfs/17167IIED.pdf>
- International Tropical Timber Organization. (1992). *ITTO guidelines for the sustainable management of natural tropical forests*.
- International Tropical Timber Organization. (2002). *Forest certification: Pending challenges for tropical timber*.
- Kollert, W., & Lagan, P. (2007). Do certified tropical logs fetch a market premium?: A comparative price analysis from Sabah, Malaysia. *Forest Policy and Economics*, 9(7), 862–868. Retrieved from <http://www.sciencedirect.com.proxy2.library.mcgill.ca/science/article/pii/S13899334106001018>
- Lacey Act Amendment. (2008). 16 U.S.C. §§ 3371–3378.
- Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403(6772), 853–8. doi:10.1038/35002501
- Potts, J., van der Meer, J., Daitchman, J., Carlile, L., Earley, J., Kenney, K., ... Holmes, D. (ed.). (2010). *The State of Sustainability Initiatives review 2010: The state of sustainability and transparency*. Winnipeg: IISD.
- Programme for the Endorsement of Forest Certification (PEFC). (2013a). *Asia promotions*. Retrieved from <http://www.pefc.org/projects/markets/asia-promotions-initiative>
- Programme for the Endorsement of Forest Certification (PEFC). (2013b). *National members: PEFC United States*. Retrieved from: <http://www.pefc.org/index.php/about-pefc/membership/national-members/8-United%20States>



- Programme for the Endorsement of Forest Certification (PEFC). (2013c). *PEFC global statistics: SFM and CoC certification* (July). Retrieved from <http://www.pefc.org/resources/webinar/747-pefc-global-certification-forest-management-chain-of-custody>
- Programme for the Endorsement of Forest Certification (PEFC). (2013d). *PEFC publishes 2013 Chain of Custody standard, aligned with EUTR*. <http://www.pefc.org/news-a-media/general-sfm-news/1192-pefc-publishes-2013-chain-of-custody-standard-aligned-with-eutr>
- Schreiber, J. (2012). *A cost benefit analysis of forest certification at the Forestland Group*. Retrieved from <http://dukespace.lib.duke.edu/dspace/handle/10161/6026>
- Sustainable Forestry Initiative (SFI). (n.d.). *SFI - Who we are*. Retrieved from <http://www.sfiprogram.org/about-us/basics-of-sfi/>
- Synnott, B. T. (2005). *Some notes on the early years of FSC*. UN Conference on Environment and Development (UNCED). (1992). *Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests*. A/CONF.151/26 (vol. III). Retrieved from <http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>
- U.S. Green Building Council. (2013). *LEED in motion: People and progress*, 3.
- Yamamoto, Y., Takeuchi, K., & Shinkuma, T. (2013). Is there a price premium for certified wood? Empirical evidence from log auction data in Japan. *Forest Policy and Economics*. doi:10.1016/j.forpol.2013.07.002