

General Forest Resources Assessment

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What is a Forest???

Characteristics of forest ecosystems:

1. Area (area).
2. Height of predominant tree species.
3. Density of the community.

Ad 1) The forest stands must have such an area (P) so that a specific microclimate can be created horizontally.

It has been conventionally determined that the minimum area of the forest stand is such that the radius of the assessed area (r) is equal to the mean height (h) at the full (100%) canopy (z = 1).

In not fully canopy-closure stands the minimum area increases inversely in proportion to the canopy degree:

$$P = \frac{\pi \cdot \bar{h}^2}{z}$$

E.g. at an average height of 20 m and with full enclosure, the minimum forest area is 0,1257 ha, in 50% enclosure it will increase to twice - 0.2513 ha.

Ad 2) The predominant tree species must be so high that the microclimate can be created vertically.

For this purpose, a **minimum height of 7 m at the age of maturity** is set in the FAO definition.

In cold (subpolar) and dry (semiarid) areas it is possible to settle with a **minimum height of 3 m.**

Trees that do not reach this minimum height are called shrubs. They usually occur under extreme growth conditions.

Ad 3) The forest vegetation must be of such density that the necessary interrelationships can arise between the trees and create a microclimate.

Height of stand	Canopy – z (%)			
	$z \leq 10$	$10 < z < 50$	$z \geq 50$	
≤ 7.0 (3.0)	Tree savannah Tree steppe Tree tundra	Open forest	Closed forest	tropical and subtropical areas temperate and boreal climate zone
0.5 – 7.0 (3.0)	Shrub savannah Shrub steppe Shrub tundra	Open shrub	Closed shrub	tropical and subtropical areas boreal climate zone

Forest is

The community of biocenoses whose **determinant are trees** of tree growth.

It is a very complex forest ecosystem consisting of a plant component (**phytocenosis**), animal (**zoocenosis**) and an abiotic environment (**biotope**).

Biocenosis (from Greek bios = life + koinos = common) is a set of populations of all species of plants, animals, fungi and microorganisms living in a particular biotope; there are certain relationships between them.

It is a living part of an ecosystem capable of self-regulation, where the biotope is the place where the community is located.

Ecosystem

Tansley (1935): a set of organisms and their environment in the unity of any hierarchical level. In the most general plane, it is possible to consider each system, including one living element.

Jeník (1995): the sum of all living organisms and the abiotic environment in a given time-space, or a set of all life forms and their manifestations taking place in the period under consideration and topographically defined space.



Each ecosystem is characterized by a set of abiotic and biotic factors that determine it.

A set of climatic factors in a given location is referred to as **climatop**.

Mode of physical and chemical agents bound to a **substrate** such as **edafotop** (at least for terrestrial ecosystems).

Climatop and edaphotop form an **ecotope** or a specific habitat.

The biotic components of ecosystems play a very important role in the overall regime of individual habitats, so, in relation to a particular organism, population or community, there is a biotope or environment that involves interaction with both abiotic and biotic environmental factors.



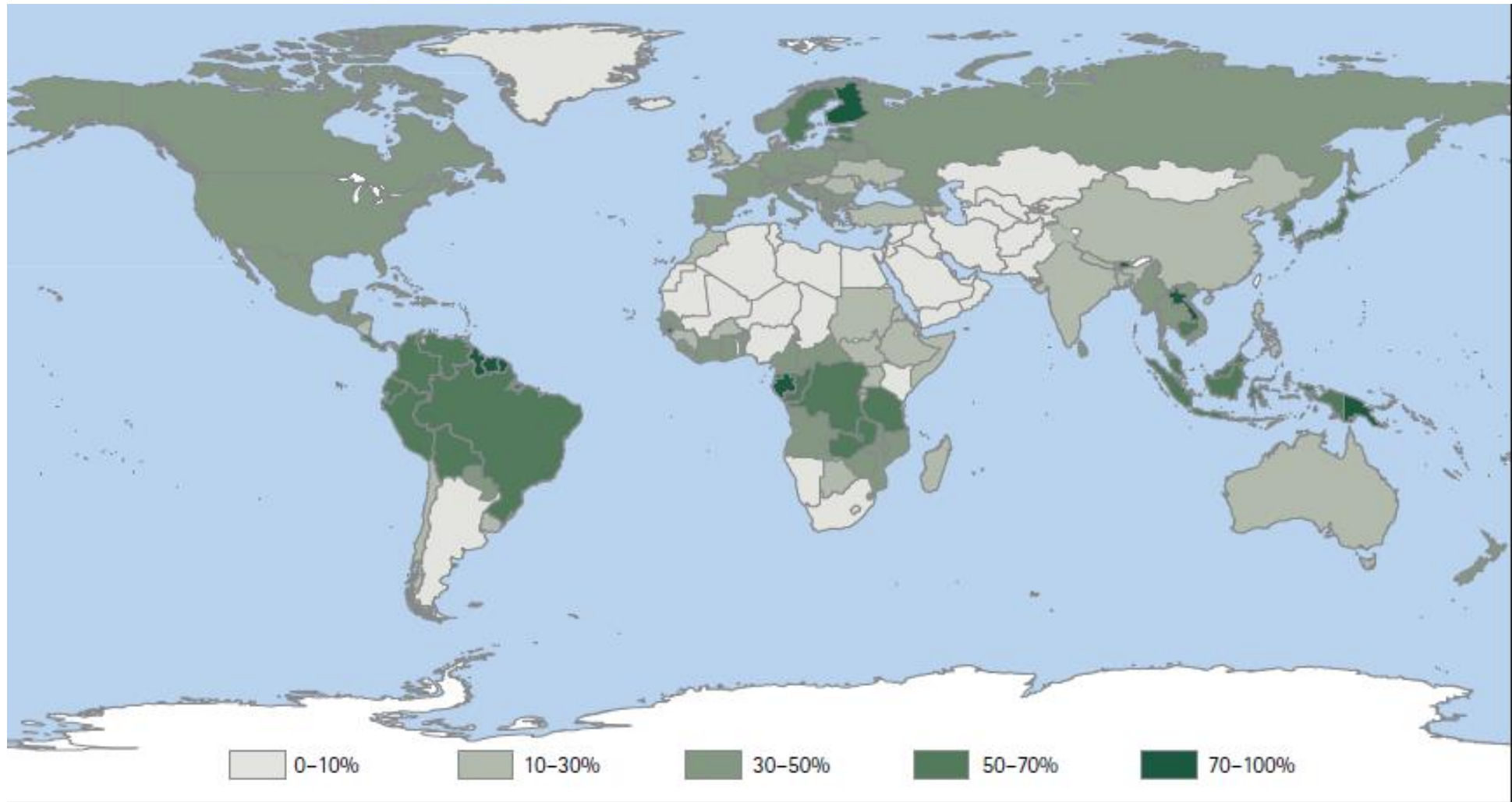
Forests cover about 31% of the total land surface.

The area of forests reaches about **4 billion hectares**, corresponding to an average of **0.6 ha per person on Earth**.

The maximum afforestation of the country since the end of the last ice age is estimated at 6.2 billion hectares.

The five countries with the largest area of forests (Russia, Brazil, Canada, the USA and China) represent more than half of the area of forests on Earth.

Ten countries do not have forests at all, and another 54 have less than 10% forestation.

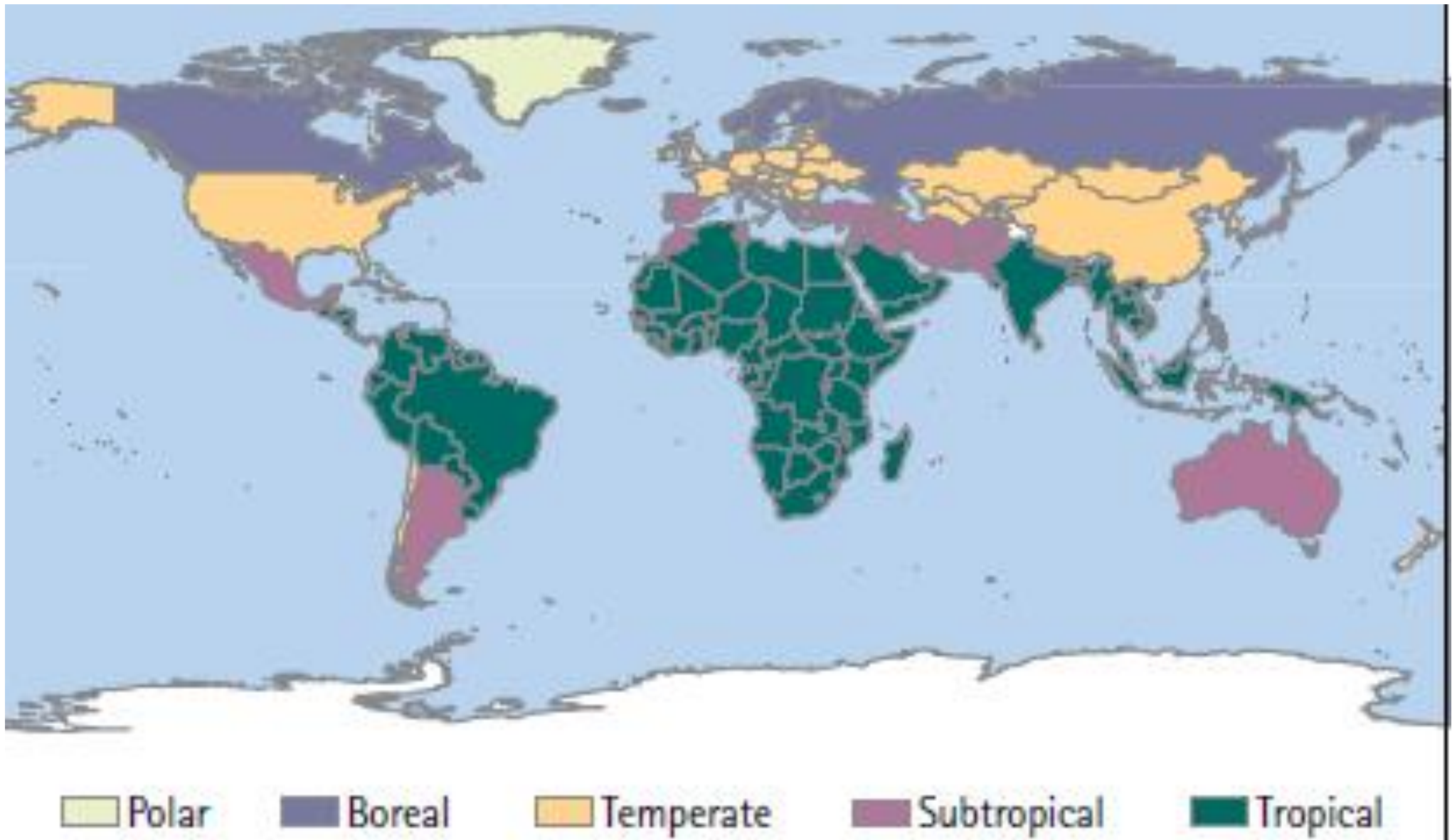


Forest area as a percentage of total land area in 2015 (FAO 2016)

TABLE 1 Global forest area change, 1990–2015

		Annual net change		
Year	Forest (thousand ha)	Period	Area (thousand ha)	Rate ^a (%)
1990	4 128 269			
2000	4 055 602	1990–2000	-7 267	-0.18
2005	4 032 743	2000–2005	-4 572	-0.11
2010	4 015 673	2005–2010	-3 414	-0.08
2015	3 999 134	2010–2015	-3 308	-0.08

^a Calculated as the compound annual growth rate.



WORLD
(234 countries and territories)

Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
FOREST AREA AND CHARACTERISTICS				
Forest area (million ha, 2015)	3 999	↓	-0.13	H/H
Area of other wooded land (million ha, 2015)	1 204	↓	-0.10	H/H
Area of other land with tree cover (million ha, 2015)	284	↑	0.52	M/M
Average annual reforestation (million ha, 2015)	27	↑	1.57	H/M
Natural forest (million ha, 2015) ^d	3 695	↓	-0.24	H/H
Planted forest (million ha, 2015)	291	↑	1.84	H/H
Net annual forest change (million ha, 2010–2015)	-3.3			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	-6.5			H/*
Net annual planted forest change (million ha, 2010–2015)	3.3			H/*
PRODUCTION				
Forest growing stock (billion m ³ , 2015) ^e	531	~	0.03	H/H
Forest growing stock (m ³ per ha, 2015) ^e	129	↑	0.16	H/H
Carbon in above- and below-ground biomass (Gt, 2015) ^e	296	↓	-0.15	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	73	~	-0.02	H/H
Production forest (million ha, 2015)	1 187	~	-0.05	H/H
Multiple-use forest (million ha, 2015)	1 049	↓	-0.16	H/H
Total wood removals (million m ³ , 2011)	2 997	↑	0.41	H/H

WORLD
(234 countries and territories)

Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
PROTECTIVE FUNCTIONS AND SELECTIVE ECOSYSTEM SERVICES				
Protection of soil and water (million ha, 2015)	1 015	↑	0.53	H/M
Ecosystem services, cultural or spiritual values (million ha, 2015)	1 163	↑	0.59	M/M
BIODIVERSITY AND CONSERVATION				
Conservation of biodiversity (million ha, 2015)	524	↑	1.75	H/H
Primary forest (million ha, 2015)	1 277	↓	-0.10	H/H
Forest area within protected areas (million ha, 2015)	651	↑	1.98	H/H

WORLD (234 countries and territories)

Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
DISTURBANCES				
Area with invasive woody species (million ha, 2010)	79	↑	11.33	L/L
Forest area burned (million ha, 2010)	65			H/*
Forest area with reduction in canopy cover (million ha, 2000–2010)	185			M/*
MEASURING PROGRESS TOWARDS SUSTAINABLE FOREST MANAGEMENT (SFM)				
Countries with policies supporting SFM (latest available year)	146			H/*
Countries with legislation and regulation supporting SFM (latest available year)	144			H/*
Forest area in permanent forest land use (million ha, 2010)	2 166			H/*
Forest area under a management plan (million ha, 2010)	2 100			H/*
Forest area certified under an international scheme (million ha, 2014)	438	↑		H/H
Countries with a national stakeholder platform (latest available year)	126			H/*
Forest area with national forest assessment since 2010 (million ha, 2014)	3 126			H/*
Forest area covered by Criteria and Indicator reporting (million ha, latest available year)	3 078			H/*
Forest area reported through periodic national state of forest reports (million ha, latest available year)	3 530			H/*

WORLD
(234 countries and territories)

Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
OWNERSHIP				
Public (million ha, 2010)	2 969	↓	-0.24	H/H
Private (million ha, 2010)	774	↑	1.00	H/H
Unknown (million ha, 2010)	141	↓	-1.19	H/H
ECONOMICS/LIVELIHOOD				
In-forest employment (million persons, 2010)	12.7	↓	-0.45	H/L
Gross value added from in-forest activities (billion USD, latest year)	116			H/*
Gross value added from the forest sector (billion USD, 2011) ^f	606			

AFRICA (58 countries and territories)				
Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
Forest area (million ha, 2015)	624	↓	-0.49	H/H
Natural forest (million ha, 2015) ^d	600	↓	-0.54	H/H
Planted forest (million ha, 2015)	16	↑	1.34	H/H
Net annual forest change (million ha, 2010–2015)	-2.8			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	-3.1			H/*
Net annual planted forest change (million ha, 2010–2015)	0.2			H/*
Forest growing stock (billion m ³ , 2015) ^e	79	↓	-0.37	H/H
Forest growing stock (m ³ per ha, 2015) ^e	128	↑	0.13	H/H
Carbon in above- and below-ground biomass (Gt, 2015) ^e	60	↓	-0.43	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	96	↑	0.07	H/H
Production forest (million ha, 2015)	165	↓	-0.77	H/M
Multiple-use forest (million ha, 2015)	133	↓	-0.46	H/M
Total wood removals (million m ³ , 2011)	614	↑	2.12	H/H

ASIA (48 countries and territories)				
Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
Forest area (million ha, 2015)	593	↑	0.17	H/H
Natural forest (million ha, 2015) ^d	462	↓	-0.24	H/H
Planted forest (million ha, 2015)	129	↑	2.17	H/H
Net annual forest change (million ha, 2010–2015)	0.8			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	-1.0			H/*
Net annual planted forest change (million ha, 2010–2015)	1.8			H/*
Forest growing stock (billion m ³ , 2015) ^e	55	↑	0.28	H/H
Forest growing stock (m ³ per ha, 2015) ^e	93	↑	0.11	H/H
Carbon in above- and below-ground biomass (Gt, 2015) ^e	36	↓	-0.23	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	61	↓	-0.41	H/H
Production forest (million ha, 2015)	247	~	-0.03	H/H
Multiple-use forest (million ha, 2015)	129	↓	-1.19	H/H
Total wood removals (million m ³ , 2011)	780	↑	1.62	H/H

EUROPE (50 countries and territories)				
Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
Forest area (million ha, 2015)	1 015	↑	0.08	H/H
Natural forest (million ha, 2015) ^d	929	~	0.01	H/H
Planted forest (million ha, 2015)	83	↑	1.11	H/H
Net annual forest change (million ha, 2010–2015)	0.4			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	0.01			H/*
Net annual planted forest change (million ha, 2010–2015)	0.4			H/*
Forest growing stock (billion m ³ , 2015) ^e	115	↑	0.40	H/H
Forest growing stock (m ³ per ha, 2015) ^e	113	↑	0.32	H/H
Carbon in above- and below-ground biomass (Gt, 2015) ^e	45	↑	0.37	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	45	↑	0.29	H/H
Production forest (million ha, 2015)	511	↓	-0.27	H/H
Multiple-use forest (million ha, 2015)	238	↓	-0.49	H/H
Total wood removals (million m ³ , 2011)	681	↓	-0.29	H/H

NORTH AND CENTRAL AMERICA (39 countries and territories)				
Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
Forest area (million ha, 2015)	751	~	-0.01	H/H
Natural forest (million ha, 2015) ^d	707	↓	-0.11	H/H
Planted forest (million ha, 2015)	43	↑	2.51	H/H
Net annual forest change (million ha, 2010–2015)	0.1			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	-0.4			H/*
Net annual planted forest change (million ha, 2010–2015)	0.5			H/*
Forest growing stock (billion m ³ , 2015) ^e	96	↑	0.29	H/H
Forest growing stock (m ³ per ha, 2015) ^e	129	↑	0.30	H/H
Carbon in above- and below-ground biomass (Gt, 2015) ^e	36	↑	0.23	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	48	↑	0.24	H/H
Production forest (million ha, 2015)	124	↑	0.82	H/H
Multiple-use forest (million ha, 2015)	391	↓	-0.20	H/H
Total wood removals (million m ³ , 2011)	513	↓	-1.48	H/H

OCEANIA (25 countries and territories)

Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
Forest area (million ha, 2015)	174	↓	-0.08	H/H
Natural forest (million ha, 2015) ^d	169	↓	-0.12	H/H
Planted forest (million ha, 2015)	4.4	↑	1.82	H/H
Net annual forest change (million ha, 2010–2015)	0.3			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	0.3			H/*
Net annual planted forest change (million ha, 2010–2015)	0.03			H/*
Forest growing stock (billion m ³ , 2015) ^e	35	↑	0.08	H/H
Forest growing stock (m ³ per ha, 2015) ^e	202	↑	0.15	L/L
Carbon in above- and below-ground biomass (Gt, 2015) ^e	16	~	0.05	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	92	↑	0.13	H/H
Production forest (million ha, 2015)	13	↑	2.38	H/H
Multiple-use forest (million ha, 2015)	54	↑	4.06	H/L
Total wood removals (million m ³ , 2011)	63	↑	2.53	H/H

SOUTH AMERICA (14 countries and territories)

Variable (unit, year) ^a	Total	Direction of change ^b	Annual change ^b (%)	Data availability ^c (status/trend)
Forest area (million ha, 2015)	842	↓	-0.40	H/H
Natural forest (million ha, 2015) ^d	827	↓	-0.43	H/H
Planted forest (million ha, 2015)	15	↑	2.38	H/H
Net annual forest change (million ha, 2010–2015)	-2.0			H/*
Net annual natural forest change (million ha, 2010–2015) ^d	-2.2			H/*
Net annual planted forest change (million ha, 2010–2015)	0.4			H/*
Forest growing stock (billion m ³ , 2015) ^e	150	↓	-0.28	H/H
Forest growing stock (m ³ per ha, 2015) ^e	178	↑	0.12	H/H
Carbon in above- and below-ground biomass (Gt, 2015) ^e	103	↓	-0.31	H/H
Carbon in above- and below-ground biomass (tonnes per ha, 2015) ^e	122	↑	0.09	H/H
Production forest (million ha, 2015)	127	↑	1.21	H/H
Multiple-use forest (million ha, 2015)	104	↑	6.44	H/H
Total wood removals (million m ³ , 2011)	346	↑	0.17	H/H

Top ten countries by reported forest area in 2015 (FAO 2016)

	Country	Forest area (thousand ha)	% of land area	% of global forest area
1	Russian Federation	814 931	50	20
2	Brazil	493 538	59	12
3	Canada	347 069	38	9
4	United States of America	310 095	34	8
5	China	208 321	22	5
6	Democratic Republic of the Congo	152 578	67	4
7	Australia	124 751	16	3
8	Indonesia	91 010	53	2
9	Peru	73 973	58	2
10	India	70 682	24	2
	Total	2 686 948		67

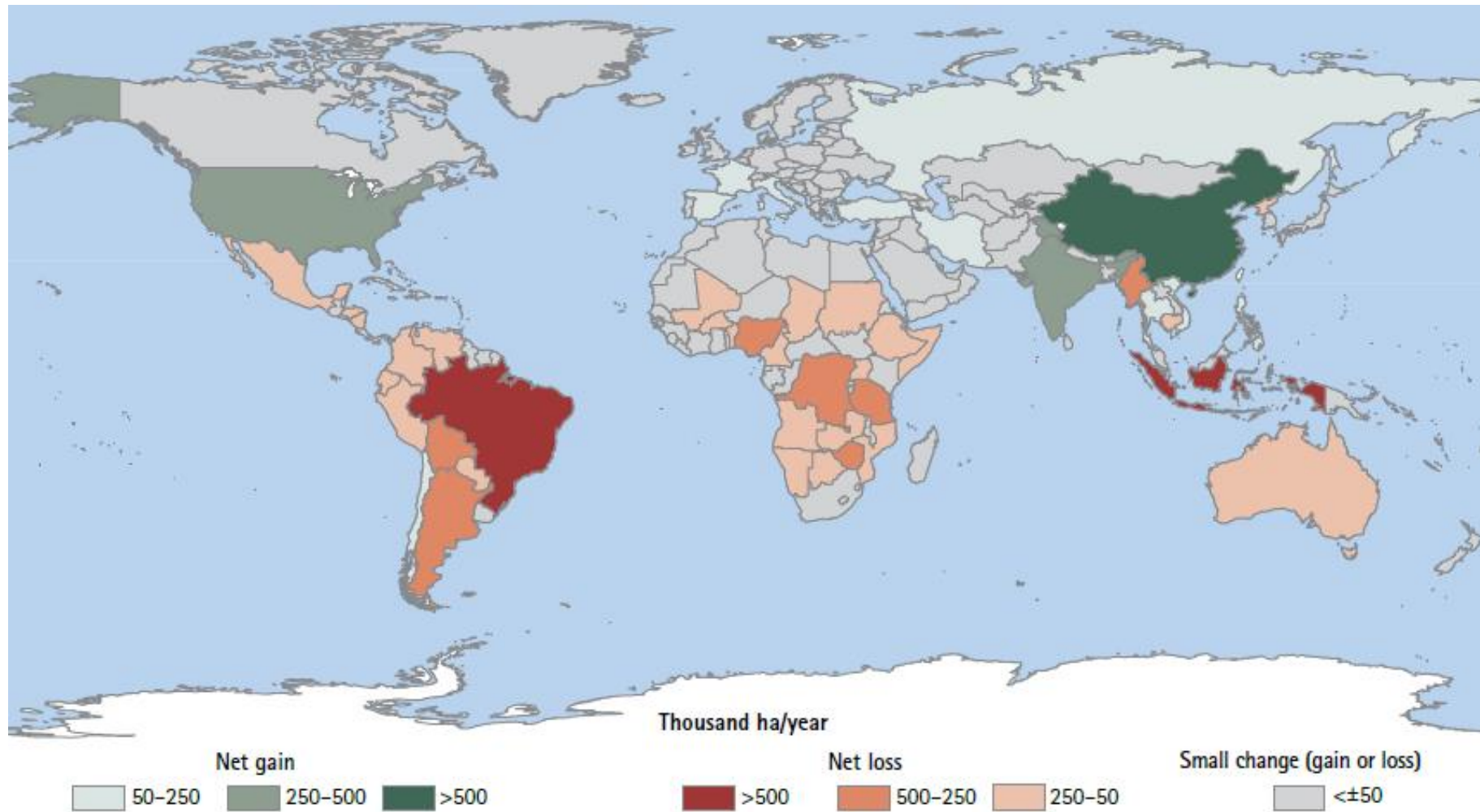
Top ten countries reporting the greatest annual net loss of forest area, 2010–2015

	Country	Annual forest area net loss	
		Area (thousand ha)	Rate (%)
1	Brazil	984	0.2
2	Indonesia	684	0.7
3	Myanmar	546	1.8
4	Nigeria	410	5.0
5	United Republic of Tanzania	372	0.8
6	Paraguay	325	2.0
7	Zimbabwe	312	2.1
8	Democratic Republic of the Congo	311	0.2
9	Argentina	297	1.1
10	Bolivia (Plurinational State of)	289	0.5

Top ten countries reporting the greatest annual net gain of forest area, 2010–2015

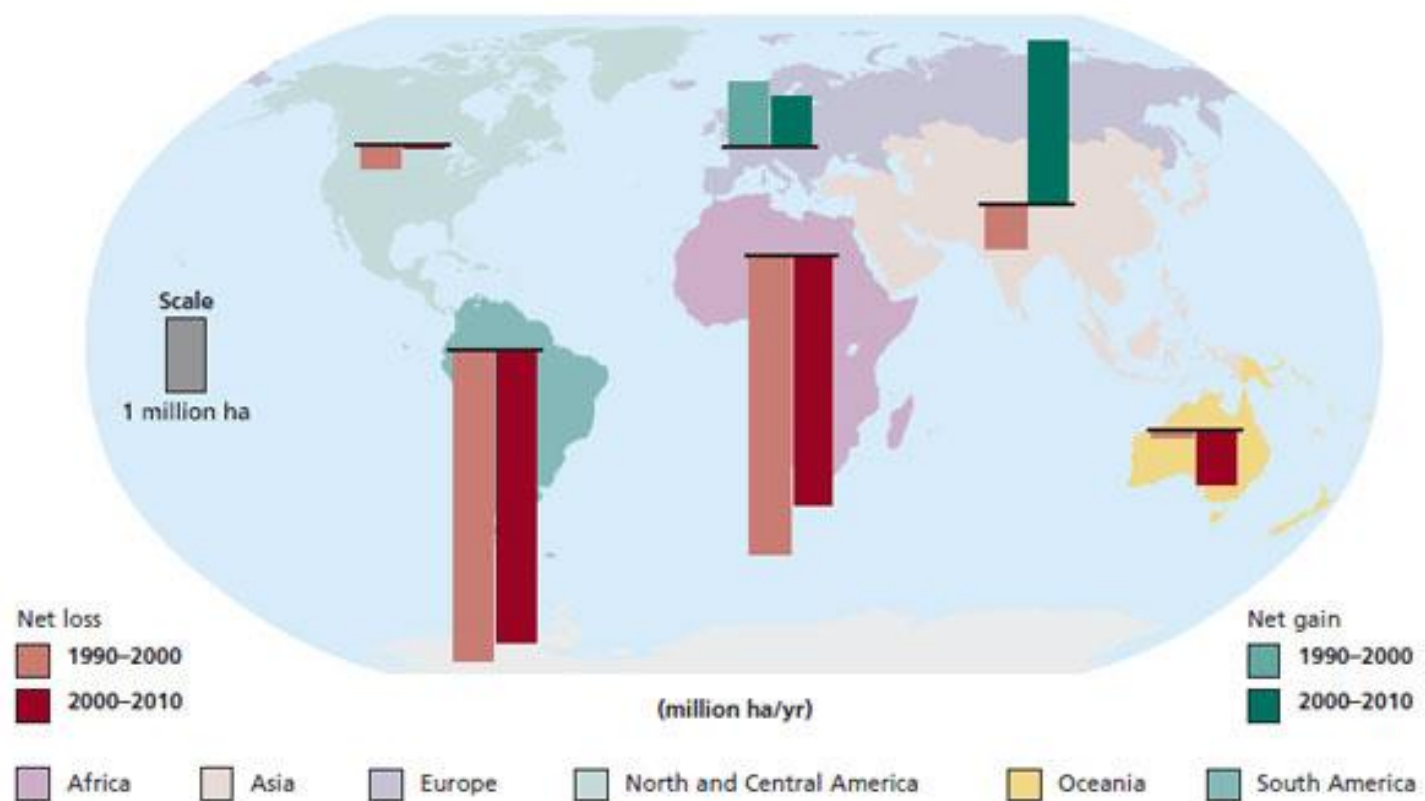
	Country	Annual forest area net gain	
		Area (thousand ha)	Rate (%)
1	China	1 542	0.8
2	Australia	308	0.2
3	Chile	301	1.8
4	United States of America	275	0.1
5	Philippines	240	3.3
6	Gabon	200	0.9
7	Lao People's Democratic Republic	189	1.0
8	India	178	0.3
9	Viet Nam	129	0.9
10	France	113	0.7

FAO (2016)



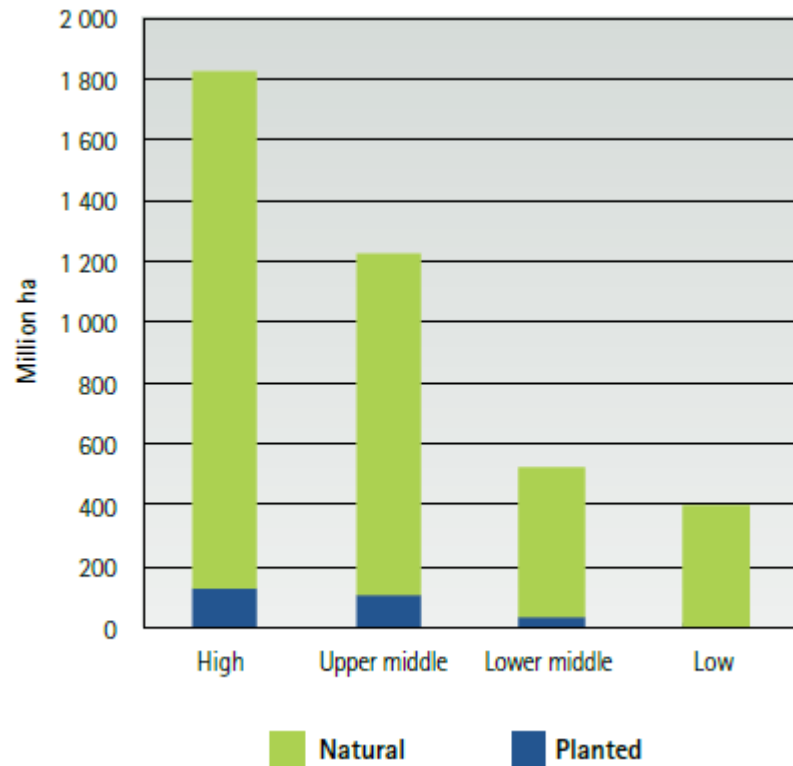
Annual net forest gain/loss by country, 1990–2015 (FAO 2016)

FIGURE 4
Annual change in forest area by region, 1990–2010



Trends in forest area in countries where a national forest transition (switch from net forest loss to net forest expansion) between 1990 and 2015 is likely or possible (K ha).

Country	1990	2000	2005	2010	2015
<i>Transition likely</i>					
Burundi	289	198	181	253	276
Gambia	442	461	471	480	488
Ghana	8,627	8,909	9,053	9,195	9,337
Rwanda	318	344	385	446	480
Bhutan	2,507	2,606	2,656	2,705	2,755
India	63,939	65,390	67,709	69,790	70,682
Laos	17,645	16,526	16,870	17,816	18,761
Philippines	6,555	7,027	7,074	6,840	8,040
Vietnam	9,363	11,727	13,077	14,128	14,773
Cuba	2,058	2,435	2,697	2,932	3,200
Costa Rica	2,564	2,376	2,491	2,605	2,756
Dominican Republic	1,105	1,486	1,652	1,817	1,983
Puerto Rico	287	450	463	479	496
<i>Transition possible</i>					
Cape Verde	58	82	84	85	90
Cote D'Ivoire	10,222	10,328	10,405	10,403	10,401
Sierra Leone	3,118	2,922	2,824	2,726	3,044
Malaysia	22,376	21,591	20,890	22,124	22,195
Thailand	14,005	17,011	16,100	16,249	16,399
Trinidad and Tobago	241	234	230	226	368

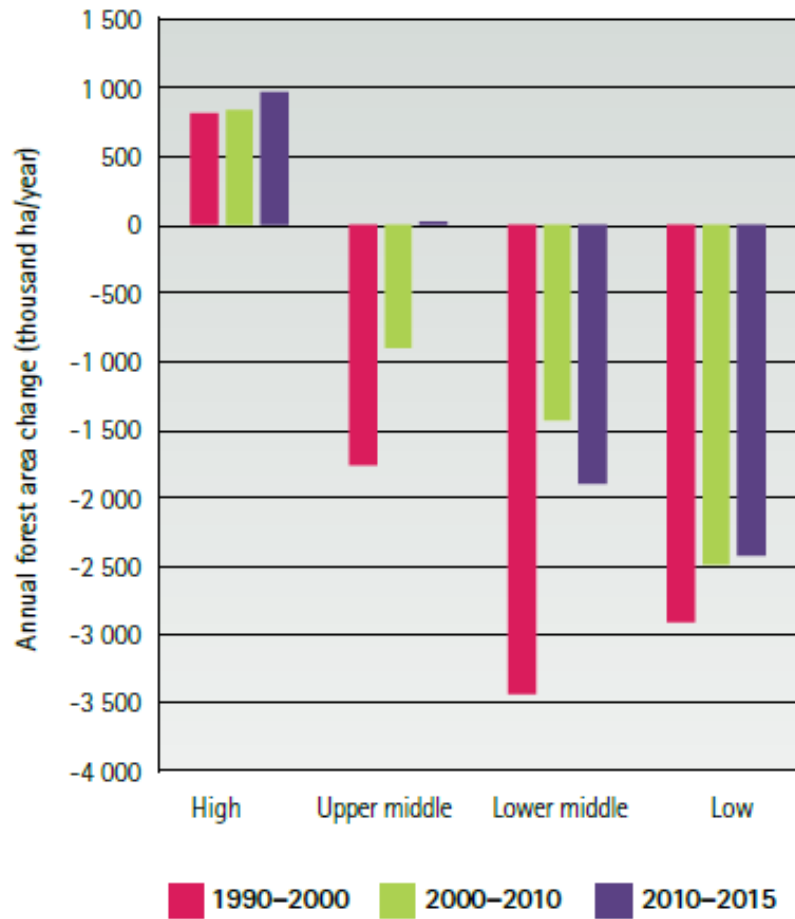


Reported natural and planted forest area by income category in 2015

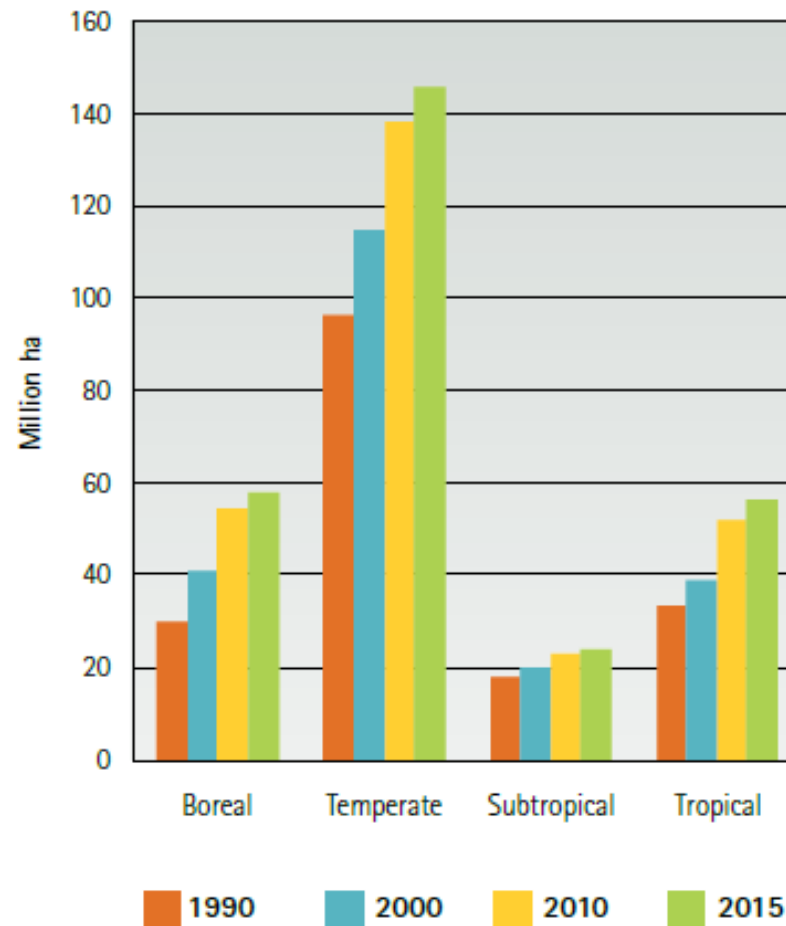


Annual forest area net change by climatic domain, 1990–2015

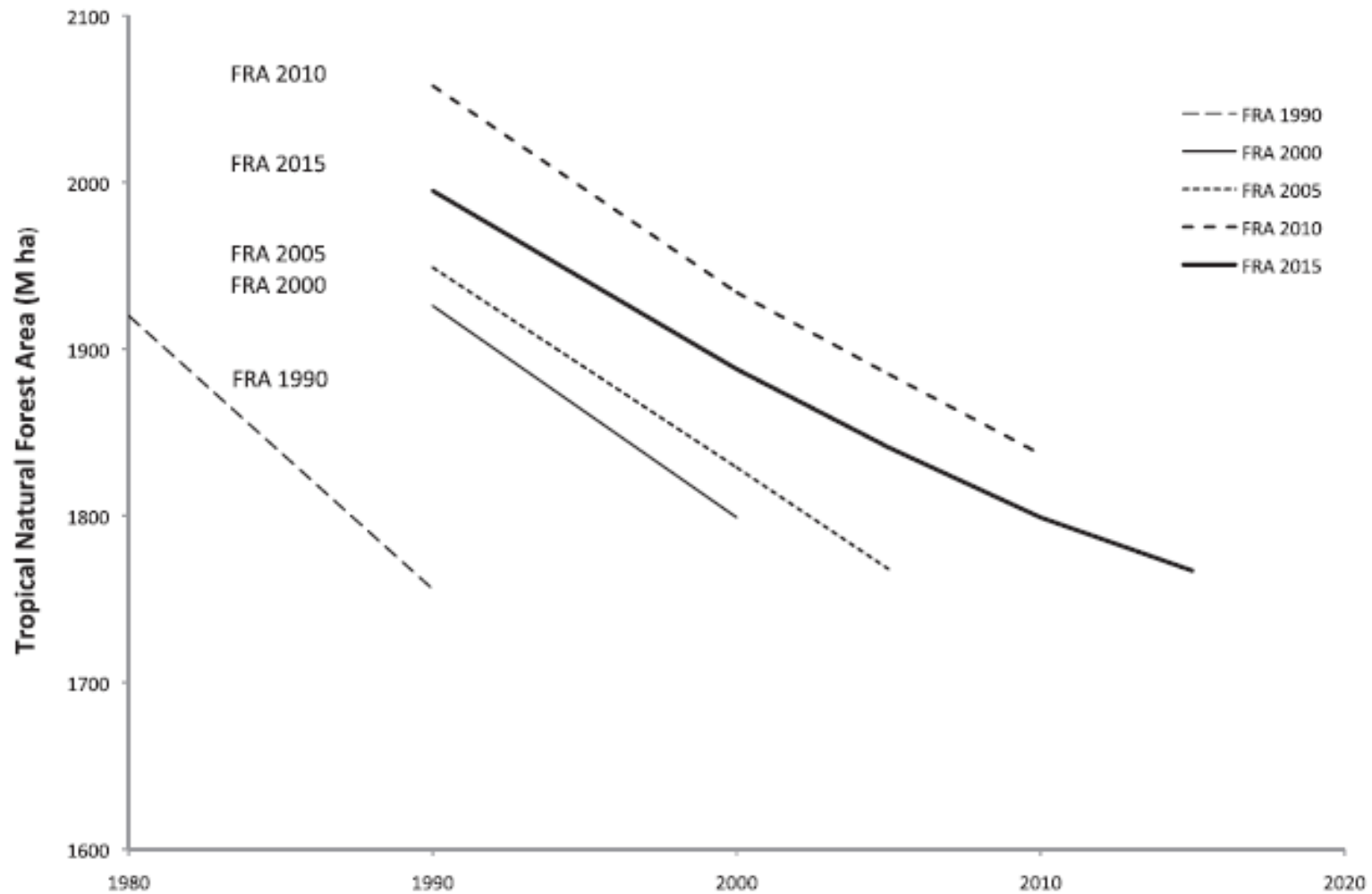
FAO (2016)



Annual forest area change by income category, 1990–2015 (FAO 2016)

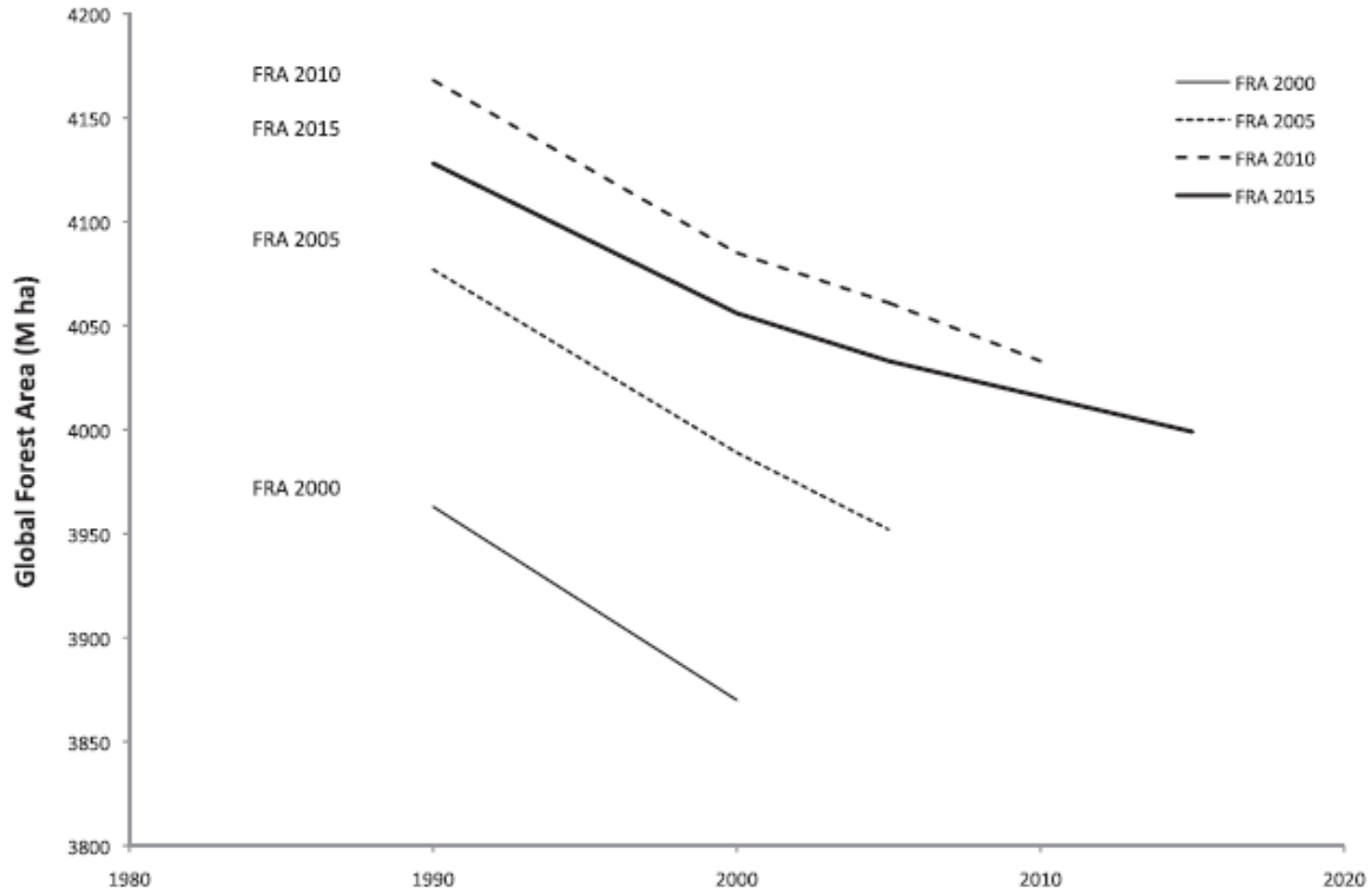


Planted forest area by climatic domain, 1990–2015



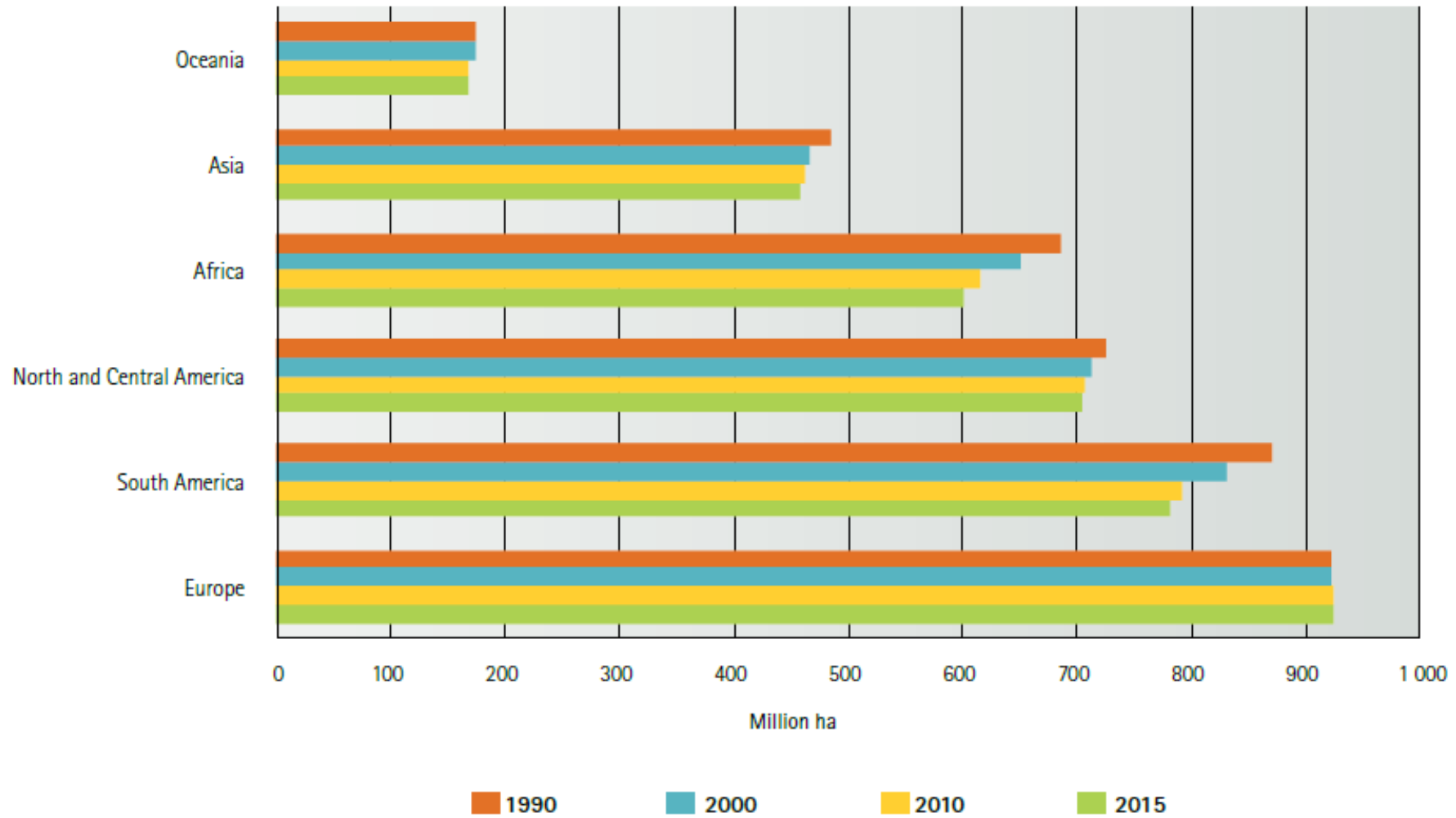
Trends in tropical natural forest area 1980–2015 in Forest Resources Assessments (FRAs) 1990–2015.

Keenan et al./Forest Ecology and Management 352 (2015) 9–20



Trends in global forest area 1980–2015 in Forest Resources Assessments (FRAs) 1990–2015.

Keenan et al./Forest Ecology and Management 352 (2015) 9–20



Natural forest area by region, 1990–2015

FAO (2016)

Change in forest area

Forest area change among **high-income countries** has been **positive over the last 25 years**, with a slight increase in the period 2010–2015.

Upper-middle-income countries have managed to reduce annual net loss of forest from about 1.8 million ha per year in 1990–2000 to a slight gain for the period 2010–2015.

Annual **net loss** of forest in **lower-middle-income countries** has gone from 3.4 million ha in the 1990s to 1.9 million ha between 2010 and 2015.

While **for low-income countries**, there was a **decrease from 2.9 million ha** in 1990–2000 to **2.4 million ha** in 2010–2015.

Future outlook

The decrease in net forest loss rates in the tropics and subtropics, combined with stable or moderate increases in the temperate and boreal zones, suggests that the global rate of forest loss will probably continue to decrease in coming years and gradually level out.

As human populations continue to increase, it is likely that there will be a continued demand for conversion of more forest land to agriculture, particularly in the tropics (unless agricultural productivity increases substantially on existing agricultural lands).

The decline in per capita forest area, coupled with steady increases in wood removals, indicates that more wood will be needed from less land in coming years.

Characteristics of the world's forests, 2010 (%)



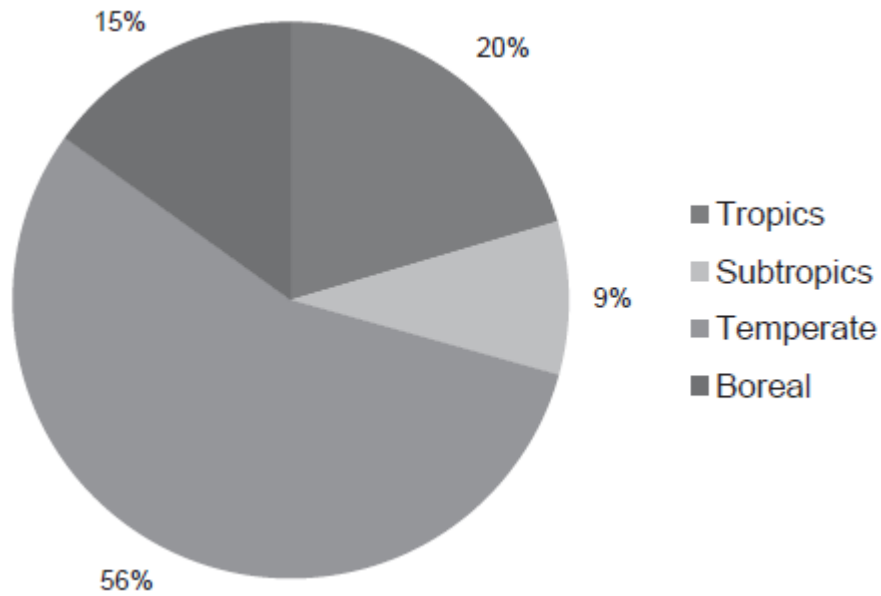
Globally, natural forest area is decreasing and planted forest area is increasing.

As of 2015 reported natural forest accounts for 93 percent of total forest area.

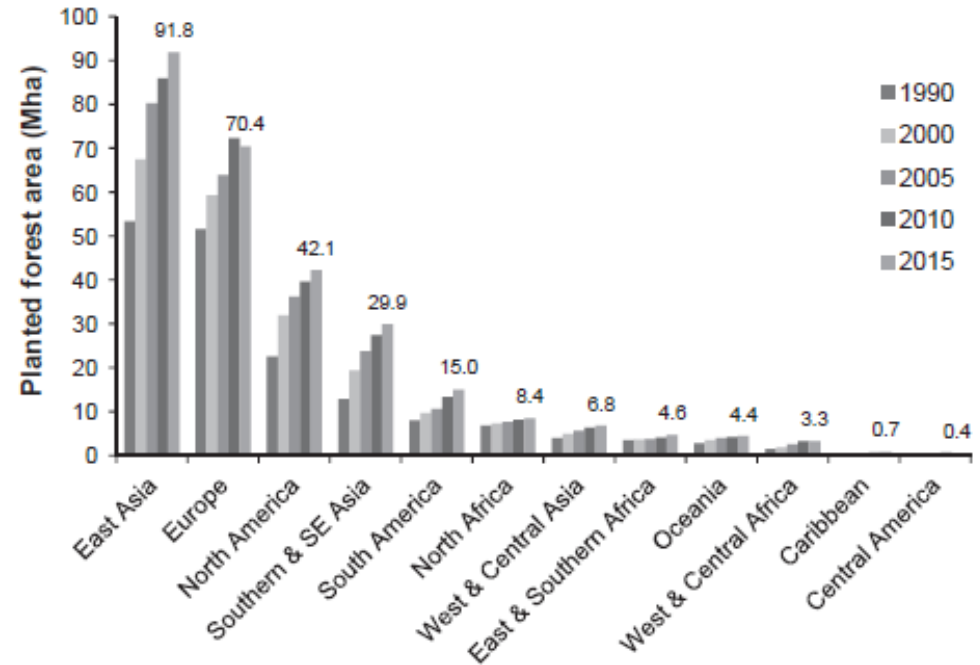
The global annual net loss of natural forests decreased from some **10.6 million ha** in the 1990s to **6.5 million ha** between 2010 and 2015.

Global planted forest area increased from 1990 to 2015 from **167.5 million ha** to **277.9 million ha** with the increase varying by region and climate domain.

Annualised rates of increase in area were highest in the 1990–2000 period (2.0%) and the 2000–2005 period (2.7%) but dropped in 2005–2010 (1.9%) and further in 2010–2015 to 1.2%.



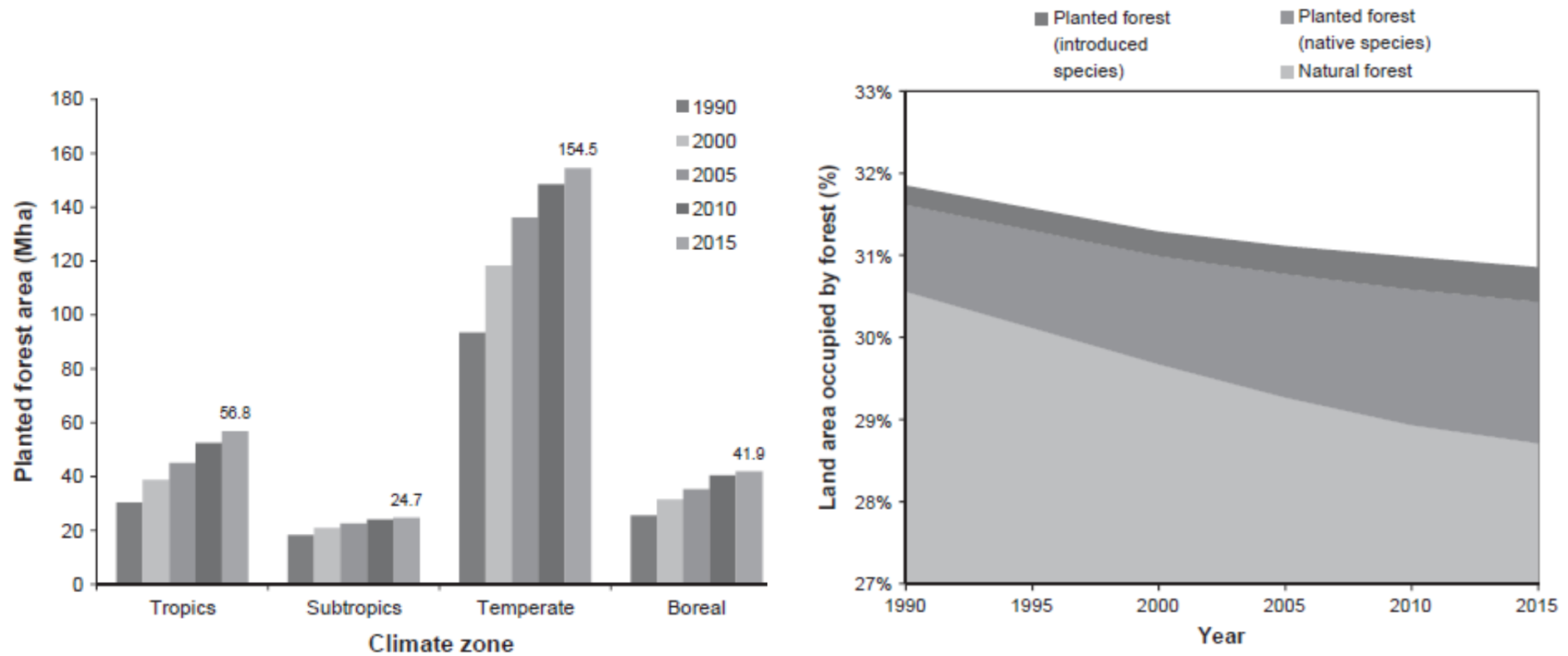
Percentage of total planted forest area in 2015 by climate domain



Changes in Planted Forest Area by FAO subregion 1990–2015

Of the 277.9 million ha of planted forests in 2015 56% are in the temperate zone, 15% boreal, 20% tropical, and 9% subtropical

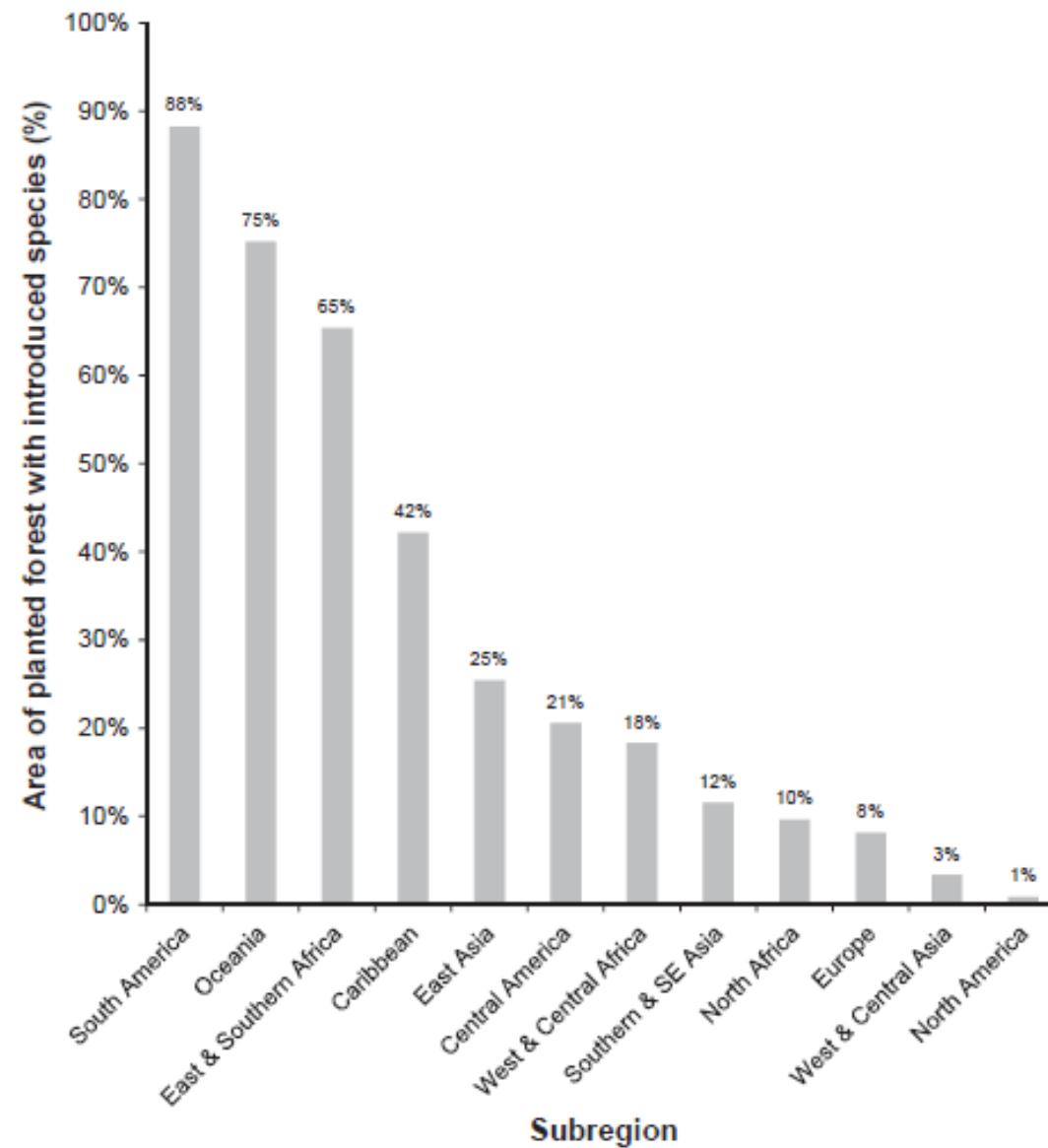
T. Payn et al./Forest Ecology and Management 352 (2015) 57–67



Trends in planted forest area 1990–2015 by climate domain.

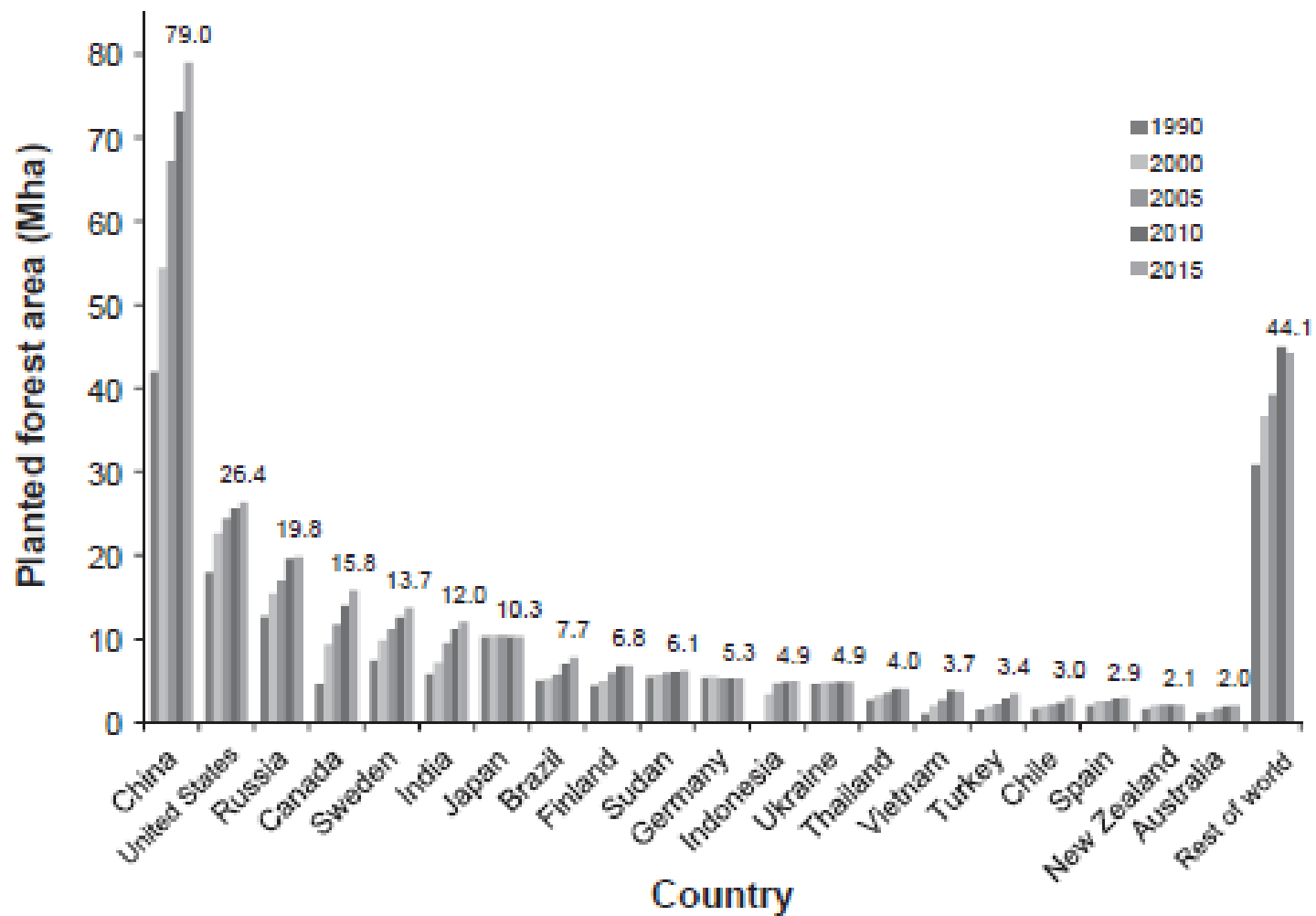
Proportion of total forest cover made up of natural and planted forests and changes with time.

T. Payn et al./Forest Ecology and Management 352 (2015) 57–67



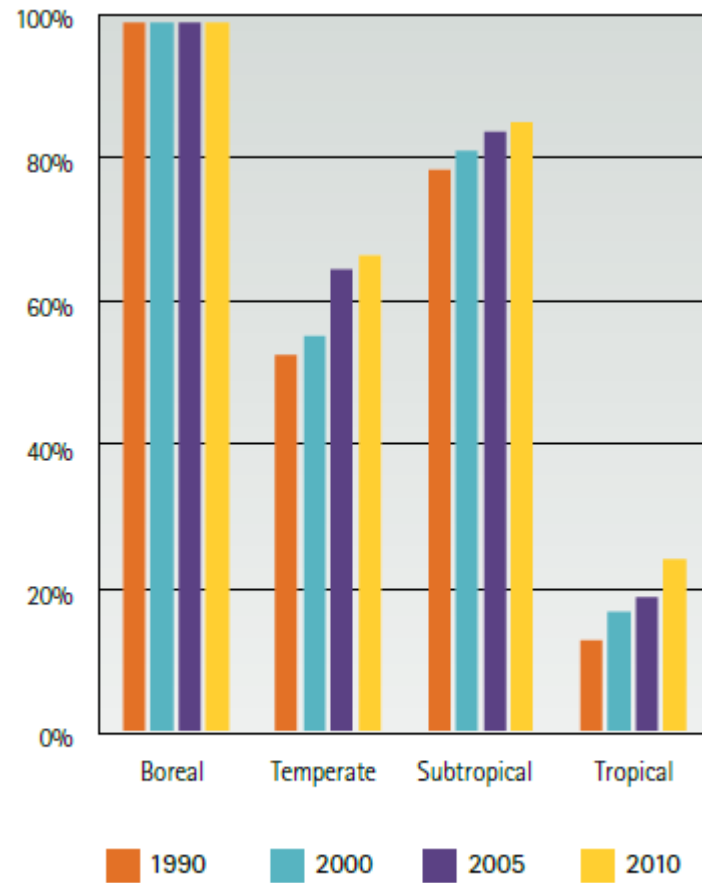
Proportion of planted forests with introduced species by FAO subregion

T. Payn et al./Forest Ecology and Management 352 (2015) 57–67



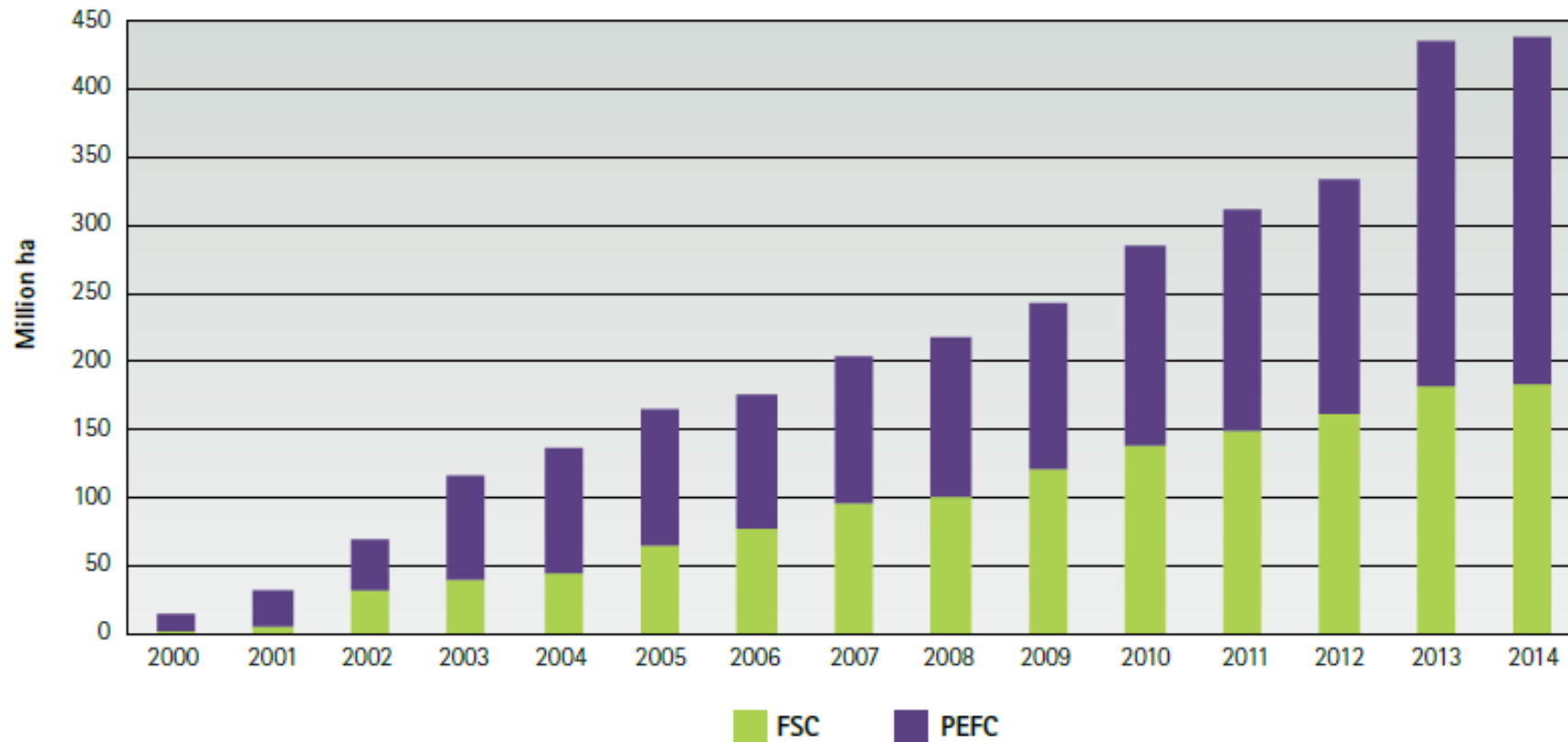
Planted forest area and trends (1990–2015) for the top 20 countries by planted forest area.

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Source: FAO, 2010.

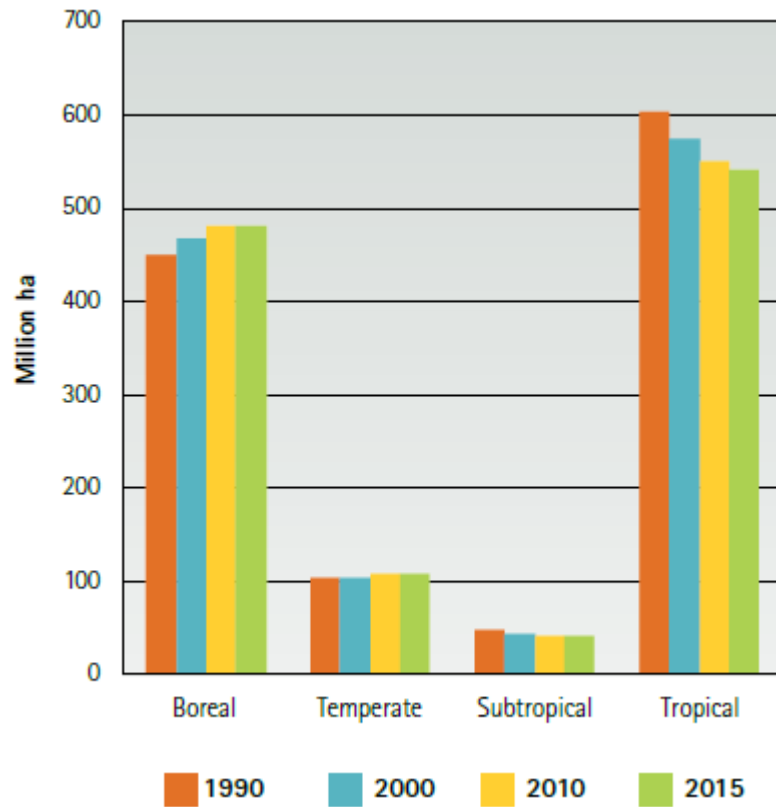
Proportion of forest area under a forest management plan by climatic domain, 1990–2010



Area of international forest management certification by FSC and PEFC, 2000–2014

Two major international certification schemes prevail: the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC).

Both schemes include criteria for best practices in forest management, covering environmental, social and economic aspects.



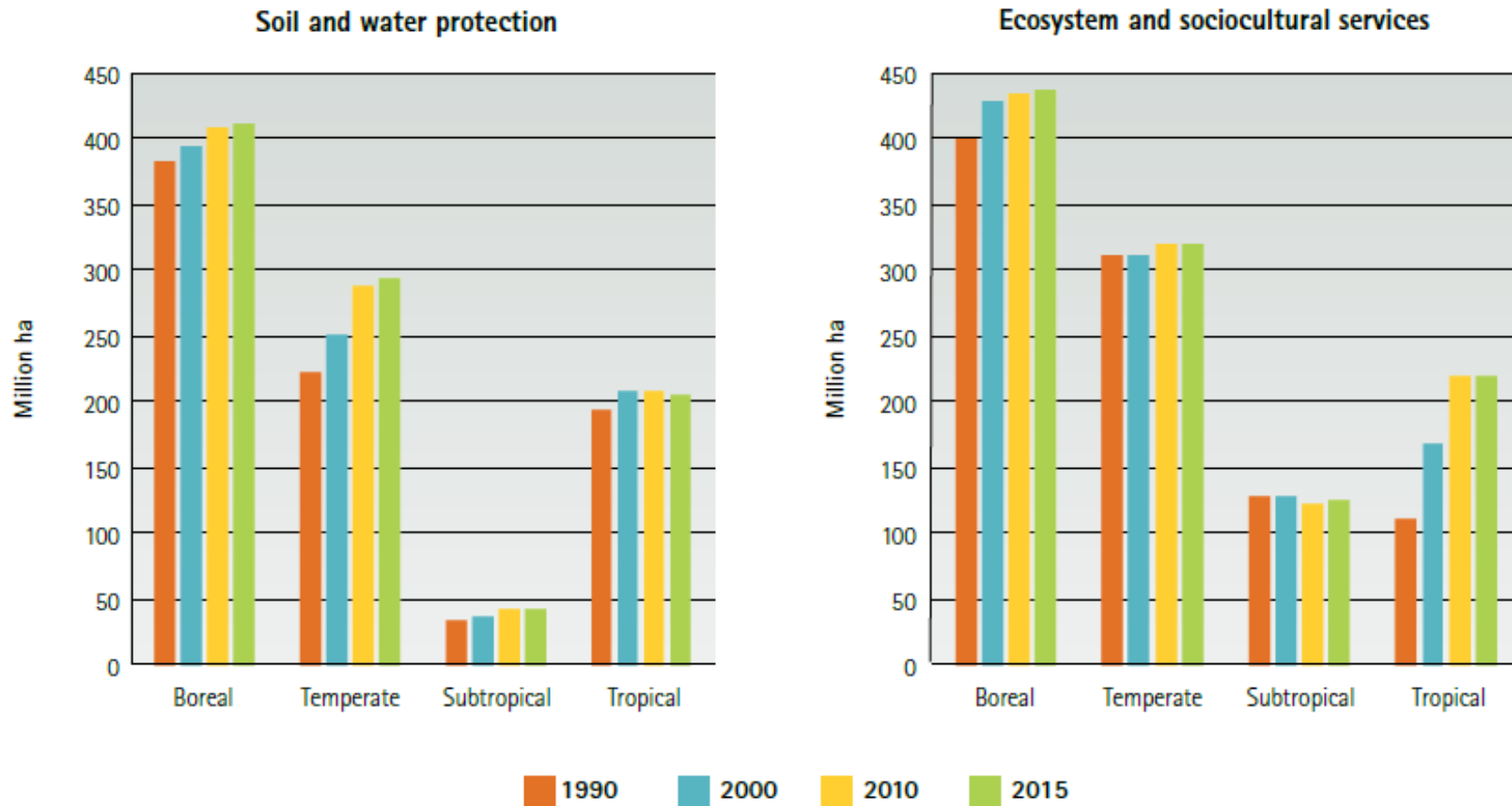
Primary forest area by climatic domain, 1990–2015

Top ten countries with forest area designated primarily for conservation of biodiversity in 2015

	Country	Forest area designated primarily for conservation of biodiversity (thousand ha)	% of forest area reported
1	United States of America	64 763	21
2	Brazil	46 969	10
3	Mexico	28 049	42
4	Russian Federation	26 511	3
5	Australia	26 397	21
6	Democratic Republic of the Congo	26 314	17
7	Venezuela (Bolivarian Republic of)	24 313	52
8	Canada	23 924	7
9	Indonesia	21 233	23
10	Peru	19 674	27
	Total	308 147	

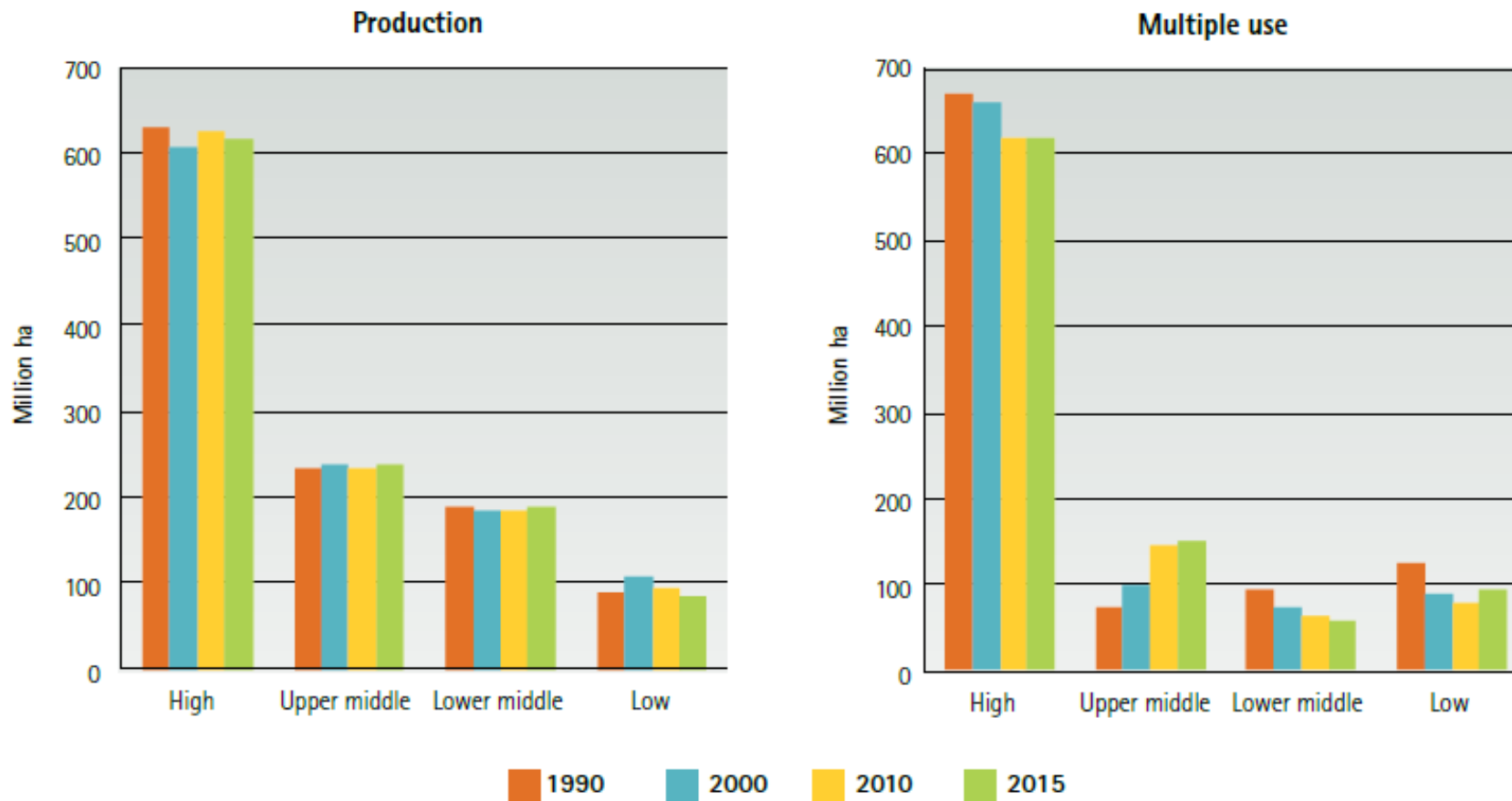
Top ten countries with forest area within protected areas in 2015

	Country	Forest area within protected areas (thousand ha)	% of country forest area
1	Brazil	206 227	42
2	United States of America	32 863	11
3	Indonesia	32 211	35
4	China	28 097	13
5	Democratic Republic of the Congo	24 297	16
6	Venezuela (Bolivarian Republic of)	24 046	52
7	Canada	23 924	7
8	Australia	21 422	17
9	Peru	18 844	25
10	Russian Federation	17 667	2
	Total	429 598	



Change in forest area allocated for soil and water protection and provision of other ecosystem and sociocultural services by climatic domain, 1990–2015

Forest area designated for protective functions has increased slightly and this trend is likely to continue.



Forest area designated for production and multiple use by income category, 1990–2015

Close to 1.2 billion ha of forest are designated primarily for production, with more than half of this area found in high-income countries and only 8 percent in low-income countries.

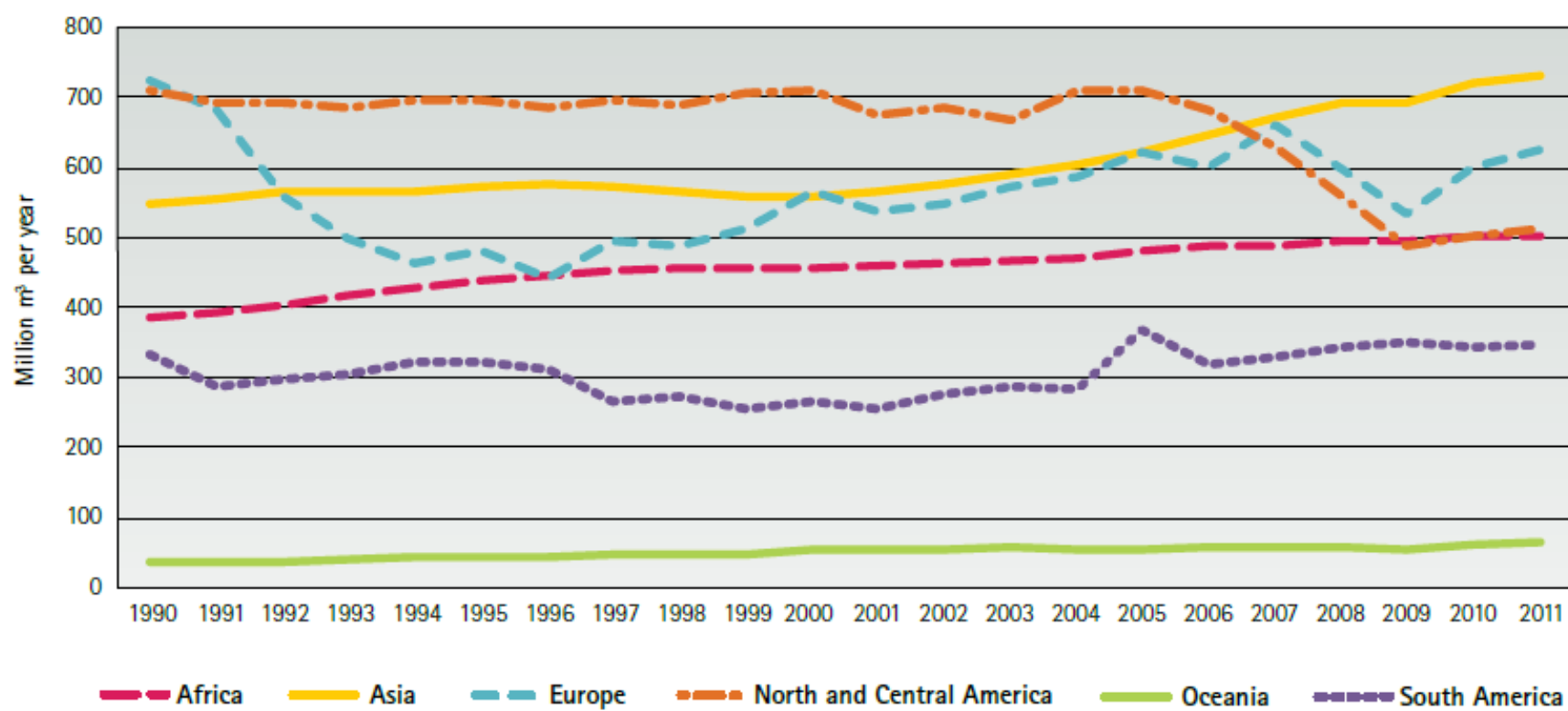
There has been a slight decrease of about 13 million ha since 1990. In addition, about 1 billion ha of forests are designated for multiple use, in most cases including the production of wood and nonwood forest products.

Top ten countries by wood removals in 2011

	Country	Wood removals (thousand m ³)	Woodfuel as % of total wood removals
1	India	434 766	88.6
2	United States of America	324 433	12.5
3	Brazil	228 929	50.7
4	Russian Federation	197 000	22.2
5	Canada	149 855	2.5
6	Ethiopia	104 209	97.2
7	Democratic Republic of the Congo	81 184	94.4
8	China	74 496	9.3
9	Nigeria	72 633	87.0
10	Sweden	72 103	8.2
	Total	1 739 608	

Globally about half of total removals are woodfuel, but the share of woodfuel varies significantly by income category.

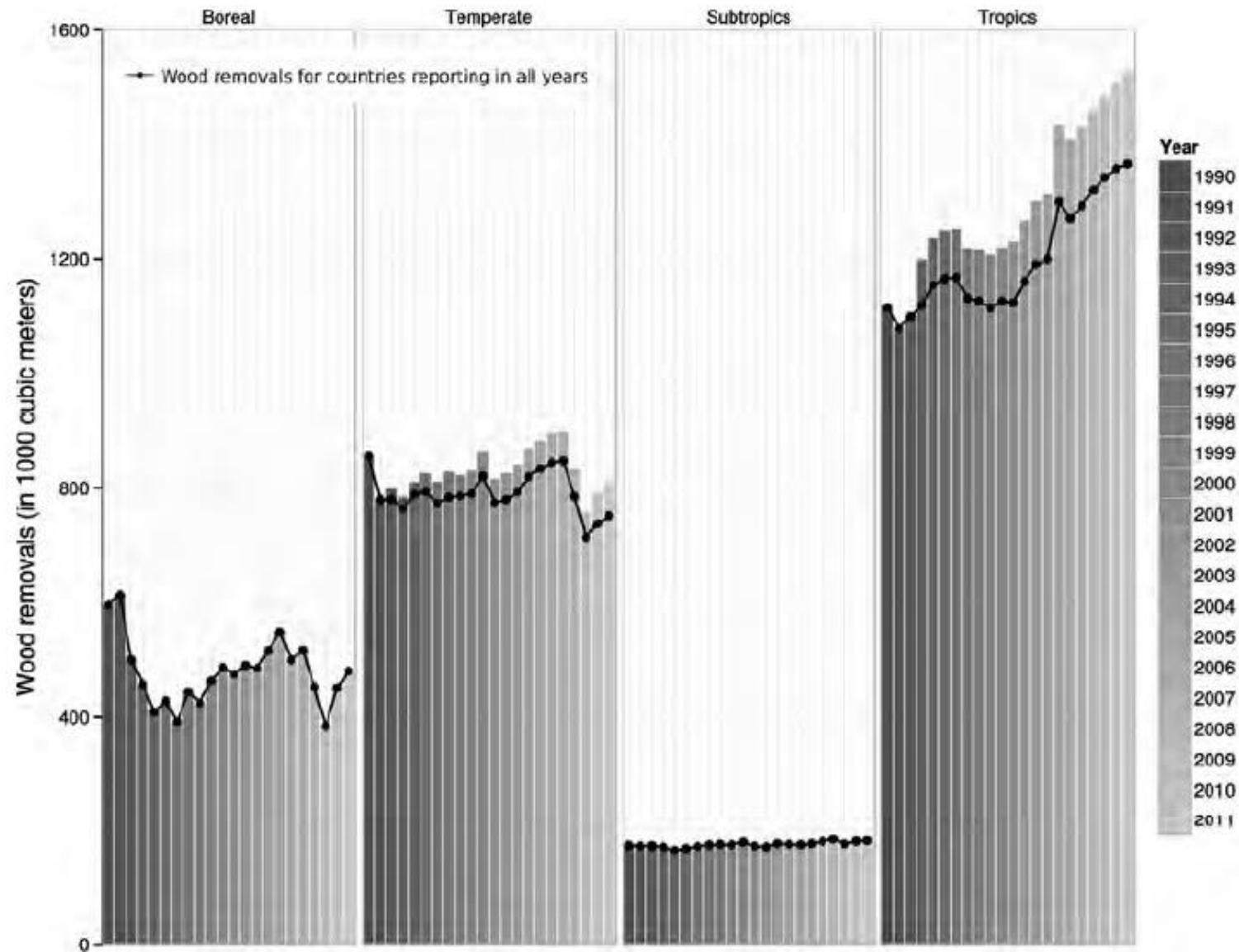
In high-income countries the share of woodfuel is about 17 percent, in uppermiddle-income countries it is 40 percent, while in lower-middle-income and low-income countries it is 86 percent and 93 percent, respectively.



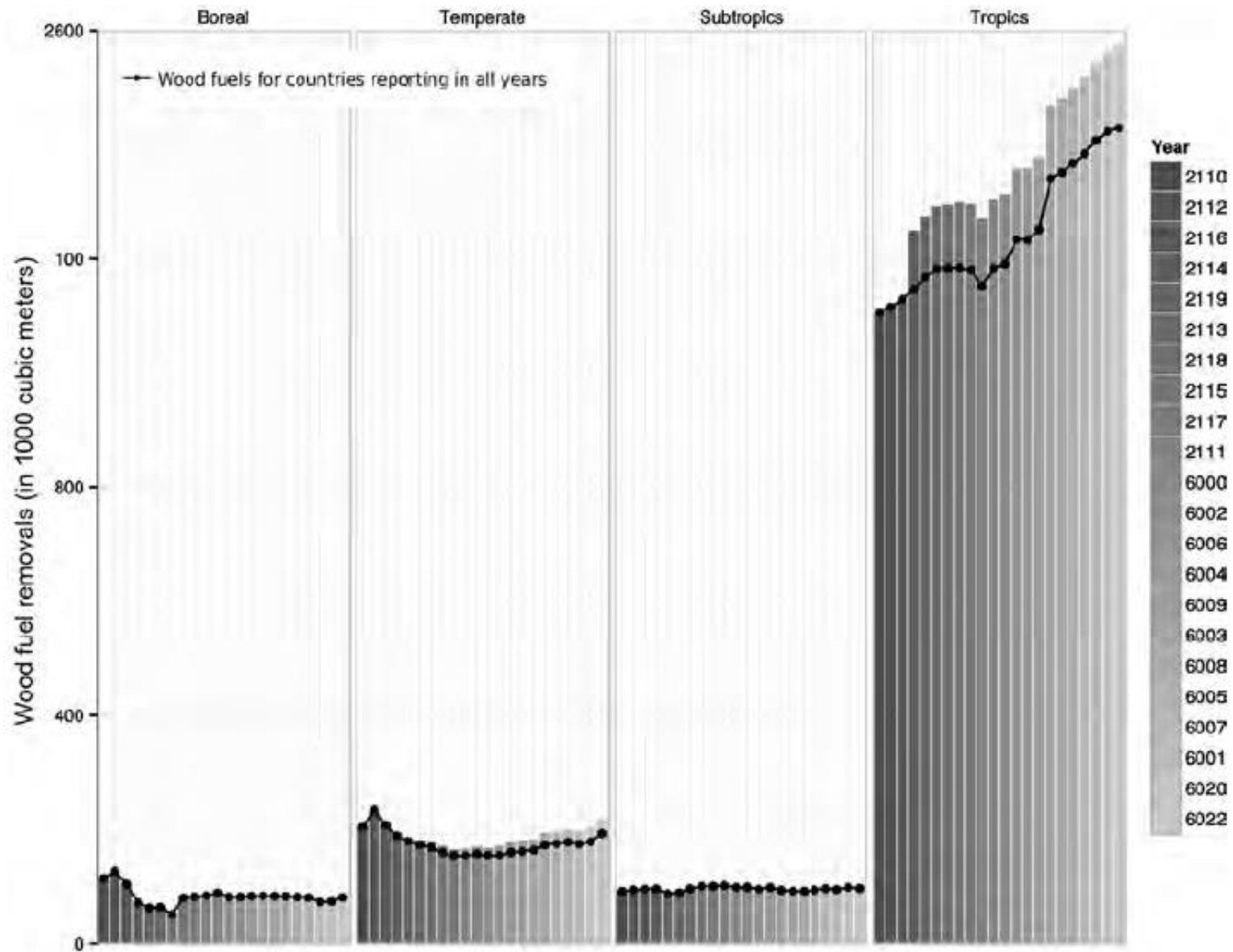
Annual wood removals by region, 1990–2011

In 2011 approximately 3 billion m³ of wood were removed globally, equivalent to about 0.6 percent of the total growing stock.

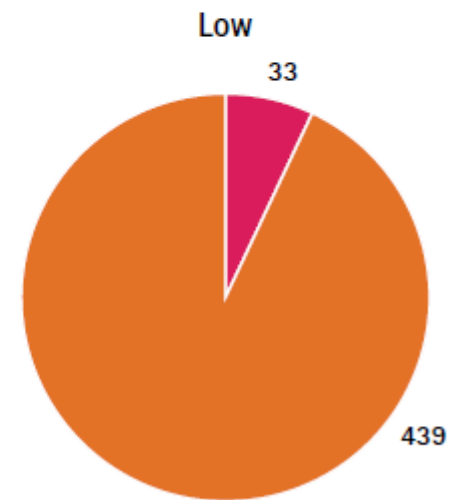
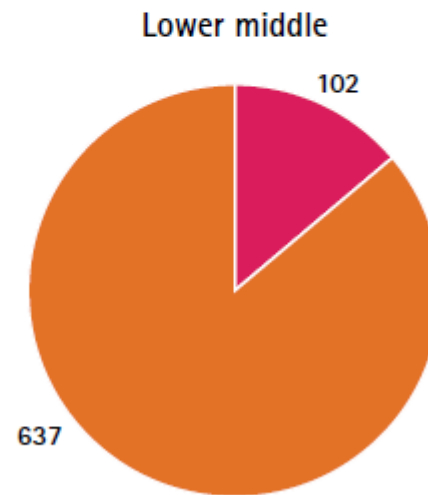
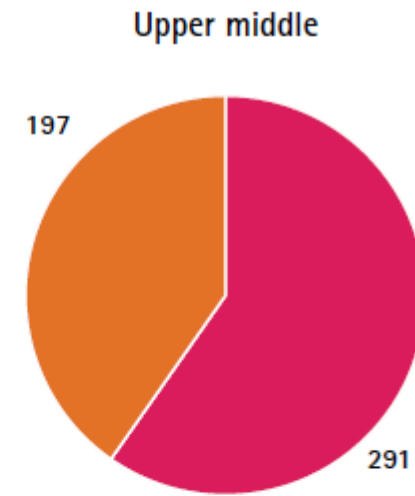
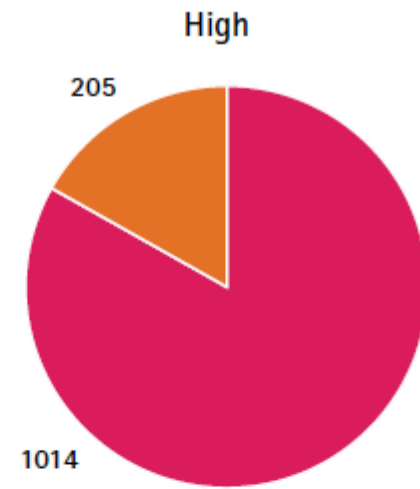
Between 1990 and 2011 annual reported wood removals remained stable but with considerable annual variation.



Köhl et al. (2015)



Köhl et al. (2015)



■ Industrial roundwood
 ■ Woodfuel

Note: The figures represent annual removals in million m³.

Industrial roundwood and woodfuel removals by income category in 2011

Top ten countries by value of NWFP removals per hectare in 2010

Country	Value of NWFP removals (USD/ha)
1. Republic of Korea	169
2. Portugal	124
3. Czech Republic	101
4. Tunisia	98
5. China	50
6. Latvia	44
7. Austria	43
8. Poland	42
9. India	35
10. Spain	34



Thank you for your attention

