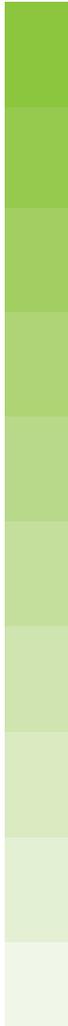




Criterion 6

Socio-economic functions of forests



Criterion summary

Criterion goals

Criterion 6 – “socio-economic functions of forests” – supplements the Criterion 3 indicators on the productive function of forest by describing the economic and social benefits of forest spaces enjoyed by society. These benefits extend from the production and consumption of the raw material to the protection services, the well-being of populations and the development of rural regions.

This is therefore the most heterogeneous criterion. It counts fifteen indicators which provide information on a variety of topics, from the structure of the forest ownership to the forest's cultural and spiritual values via employment, health and training, economic performance of the forest sector, integration of forests with the regions, certification, access to forests for recreational purposes, etc. It is proposed to group indicators into four themes to give the information in this criterion some semblance of order: humans and forest regions (6 A), economic characteristics of the French forestry sector (6 B), investments and efforts for ecological or environmental purposes (6 C) and cultural, social and spiritual needs and values (6 D).

Analysis

6.A. Humans and forest regions

The 16 million odd hectares of French forests are territories marked by Man and his intervention. The information under Criteria 1 and 3 shows how Man has fashioned the forest through management and what benefits he gains from it, but now Criterion 6 provides details on the men who fashion the forests and process the timber and how they incorporate the forestry problem into the problems of development and sustainable management of regions through the following indicators:

- 6.1. Structure of the forest ownership
 - 6.1.2. Training in the forestry sector,
- 6.5. Jobs in the forest-timber sector
- 6.6. Occupational health and safety in the forestry sector,
 - 6.1.1. Integration of forests in local initiatives,
 - 6.1.3. Voluntary sustainable management certification initiatives

The management goals and methods change according to whether the forest is publicly or privately owned, the size of the holding and the management operators (**Indicator 6.1**). These elements influence the timber mobilization capitalization capacity and the spatial organization of stands.

Three quarters of French forests are privately owned and one quarter publicly owned (municipalities and other communities, State). In 2012, there were 3.3 million owners for the 10.4 million hectares of private forests. Those owning 25 hectares or more hold slightly less than half the surface areas and account for just 2% of owners. In 2014, the 17,000 “public forest owners” shared 4.6 million hectares (for 37% State-owned). Public forests are mainly large (several hundred hectares on average against a few hectares only as private forest).

Proof of the appeal of the forestry sector and the sensitivity of players (owners and elected representatives) to sustainable management, between 2010 and 2014, training (**Indicator 6.1.2**) has tended to rise both in terms of diploma and non-diploma courses for owners; however, initial training courses are showing a slight drop in graduates.

At the same time, silviculture and logging provide almost thirty thousand full time equivalent jobs (**Indicator 6.5**). Despite the downward trend of employment in silviculture and logging in the period analyzed, it remains fairly stable, at around 14%, in the timber sector as a whole.

Mirroring the better working conditions, the work accident frequency rate in the forestry sector (**Indicator 6.6**) has been improving steadily since 2002. All the sectors are showing a downward trend and although logging has traditionally been the most risky activity, clear progress has been made as the accident frequency rate per million hours worked in this activity is now at the same level as for silviculture.

Forest regions are at the heart of rural area development and organization, testifying especially to the development of massif development plans (390 plans for 930,000 owners involved and about 2.9 million hectares) and territorial forest charters (140 charters in 6,800 municipalities for a forest area of 5 million hectares of which 68% is privately owned) (**Indicator 6.6.1**). Sustainable forestry dynamics within territories are also expressed through expanding certification (**Indicator 6.1.3**): over half the national forest areas are certified for their sustainable management, the guarantee of environmentally-friendly, socially beneficial and economically viable management.

Forests make a major contribution to rural economies, to the living environment and well-being of populations in the rural areas. Many situations encountered in French forests can be sources of wealth and diversity, mainly at the scale of landscapes, the diversity of stands, habitats and management (or non-management) methods; but they can also generate economic (timber mobilization costs, owner incentives, etc.) or ecological (fragmented habitats) difficulties.

6.B. Economic characteristics of the French forestry sector

Processed forest products are sources of trade and create value for the French economy. This section of Criterion 6 sets out a few macro-economic indicators of the forestry sector that can replace value within the French economy:

- 6.2. Formation of the added value of the forest-timber-paper-furniture sector,
- 6.3. Distribution of the added value of the forest-timber-paper-furniture sector,
- 6.7. Timber consumption
- 6.8. Imports and exports.

The added value created by the forest and timber activity is around 12 billion euros in 2012 (all sectors together, including over 18% for silviculture and logging). Overall, the contribution of the sector to the national wealth (share of the gross domestic product) is showing a downward trend (scarcely more than 0.5% in 2012 against nearly 1% in 1999) (**Indicator 6.2**). The gross logging surplus in the timber sector, which includes the profitability of the sector's production system, is around 3 billion euros every year, including over a billion for the silviculture and logging sector (**Indicator 6.3**).

An analysis of the apparent consumption in volume (production + imports – exports) and international trade in both volume and value (**Indicators 6.7 and 6.8**) indicates that France is a net importer of many products, mainly processed products with high added value. The trade balance in 2014 shows a deficit of 6.8 million cubic meters of roundwood equivalent and 4,497 million euros 2014, i.e. more than 10% of the global French foreign trade deficit (for 0.59% of the gross domestic product).

The macro-economic indicators are used to assess the economic vitality of a sector and its significance in the domestic economy. Although the silviculture and logging data appear to confirm the dynamics of forests, forestry workers and regions, the overall sector performances must be tempered due to lesser performances of other timber processing sectors.

6.C. Ecological or environmental actions

Although Criteria 1, 2 and 4 in particular have indicators reflecting the state of French forests and the pressures facing them, the indicators in this section of Criterion 6 provide (partial) information on the potential responses by society to certain environmental problems:

- 6.4. State expenditure on forests
- 6.7.1. Recycling and salvage,
- 6.9. Fuelwood.

Major public expenditure (**Indicator 6.4**) is granted to support sustainable forest management (annual figures of 140 million euros for non-State-owned public forests and 80 million for private forest management). Added to this are a variety of general interest missions fulfilled by the forests with human support (169 million euros for preventing and fighting fires, restoring the forest canopy after storms and conservation of soils and the biodiversity). Lastly, all the resources for expanding knowledge of forest ecosystems are more difficult to assess but are probably in the order of 100 to 200 million euros (on-going monitoring of resources and research means).

At the same time, public policies encourage the recycling and salvage of wood products and the use of renewable energy sources such as wood (**Indicators 6.7.1** and **6.9**). Thus, the sawmill by-products take on increasingly significant economic and ecological importance; they are no longer considered waste but as raw material for the crushing operations and energy production. Similarly, the main raw material used in the paper and paperboard industry is still (and this is consolidating in 2014) recycled paper and paperboard. In addition, the 46 million cubic meters of wood and by-products used for energy purposes account for 4% of the total primary energy consumed in 2013 and 47% of the renewable energy.

6.D. Cultural, social and spiritual needs and values

Lastly, Criterion 6 measures part of the social benefits which Man gains from forests through two indicators:

6.10. Public access to the forests,

6.11. Forests with cultural or spiritual value.

Opening forest spaces to the general public is a social issue of prime importance (**Indicator 6.10**). The metropolitan forest area counted in number of inhabitants is 0.26 hectare. More than half French people say that they go to the forest for recreational pursuits at least once a year. Public access is part of the missions and goals of public forests, but a large proportion of private forests is also open to the public, as 85% of owners say that they welcome visitors to their forests, i.e. nearly three quarters of private forest areas.

The cultural or spiritual value of forests is without doubt very important for the populations but also very difficult to measure (**Indicator 6.11**). Forest sites with strong cultural or symbolic value include classified sites, arboretums in public forests, biosphere reserves, world heritage sites, unusual trees and populations, peri-urban protection forests and *forêts d'exception* (exceptional forests) in State-owned forests.

Conclusion

The very actions of forest owners and managers provide a multitude of economic, social and environmental benefits. The most obvious are – perhaps – what society gains from timber production and timber processing industries. These values can be measured fairly easily, but are always partially limited by difficulties in separating out the proportion of value linked to the timber or the forests in activity sub-sectors or indirect fallout in terms of creating value or jobs, for example. But despite it being linked without question to the market mechanisms and formal economy, the forest cannot be reduced to this trade component alone. History and reason show that the forest have always been subject to complex interactions with the environment, regions and populations. Productions other than timber, tourist activity and ecological considerations, although difficult to measure, play a full role in the sustainable management of French forests.

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6.1. Structure of the forest ownership

6.1.a. Nature, size and number of forest holdings

6.1.b. Breakdown of private holdings per type of manager

6.1.c. Proportion of different ownership categories at regional scale

Warning: The data in Table 6.1.a on the surface area and number of owners per holding size class do not come from the same source as those in Table 6.1.c, which gives the total surface areas per ownership category at regional scale. The total surface area values cannot therefore be compared: some come from land registry and survey data whilst others are forest inventory data.

Purpose of the indicator

This indicator presents the breakdown of the forest area per category and per ownership size at national (6.1.a) or regional (6.1.c) scale and the proportion of private surface areas managed by the largest managers (6.1.b).

The management goals and methods therefore change according to whether the forest is publicly or privately owned (6.1.c). The State-owned and municipal forests all have a single manager – the National Forests Office – and a management plan – development document approved by the State services. Private forests are managed directly by their owners or via an expert or cooperative. A management document approved by the public authorities – the *simple management plan* – is mandatory above 25 ha, but some smaller holdings can fall under an approved sustainable management document (*simple management plan, standard management regulation, etc.* (see Indicator 3.5). The largest owners and managers of private forests (6.1.b) help to facilitate timber mobilization in compliance with environmental or social requirements.

Apart from the mandatory presentation thresholds of a sustainable management document for private holdings, the size of the forest holding (6.1.a) dictates the management methods (and, if appropriate the non-management), influences the timber mobilization capacity and structures the spatial organization of stands.

This indicator sheds light on the economic issue (forest management level, felling rate, timber mobilization cost, etc.) and also the social (public access to State-owned and municipal forests governed by the forestry regulations) and environmental (heterogeneity of management methods in the landscape, diversity of stands, existence of freely evolving forests, etc.).

Results

6.1.a. Nature, size and number of forest holdings

Class of surface area	Ownership category	1976-1983	1999	2012	Public forest managed by ONF						
		Private forest			State-owned forests	other forests governed by the forestry regulations	State-owned forests	other forests governed by the forestry regulations	State-owned forests	other forests governed by the forestry regulations	
Variables											
Less than 1ha	surface area (1000ha)	773	745	679 ± 0	0.01	0.04	0.00	0.04	0.00	0.04	
	number of owners* (x 1000)	2,360	2,361	2,176 ± 0	0.02	0.07	0.00	0.06	0.00	0.06	
1 to 10ha	surface area (1000ha)	3,188	2,975	3,061 ± 27	0.14	8.26	0.04	8.24	0.03	8.87	
	number of owners* (x 1000)	1,165	934	965 ± 135	0.03	1.47	0.01	1.48	0.01	1.58	
10 to 25ha	surface area (1000ha)	1,464	1,761	1,774 ± 141	0.72	37	0.51	36	0.46	37	
	number of owners* (x 1000)	100	120	120 ± 11	0.04	2.16	0.03	2.09	0.03	2.17	
25 to 100ha	surface area (1000ha)	1,905	2,641	2,148 ± 160	9.53	282	7.80	274	7.34	282	
	number of owners* (x 1000)	42	58	46 ± 3	0.17	5.03	0.13	4.87	0.12	5.01	
100 to 10,000ha	surface area (1000ha)	2,410	2,498	2,775 ± 201	1,744	2,446	1,694	2,649	1,697	2,661	
	number of owners* (x 1000)	9	11	11 ± 1	1.21	6.57	1.16	6.84	1.15	6.88	
Total	surface area (1000ha)	9,740	10,620	10,438 ± 261	1,755	2,773	1,702	2,967	1,705	2,989	
	number of owners* (x 1000)	3,676	3,484	3,318 ± 0	1.47	15.29	1.33	15.34	1.30	15.70	

Sources: SSP (private forests), ONF (public forests)

Forest estates and time domains involved:

Private forests:

Years 1976-1983: survey of the economic silviculture structures by the Statistics and Forecasting Department (SSP).

Years 1999 and 2012: SSP surveys of the structure of private forests in 1999 and in 2012 for holdings of 1 ha and more and land registry for the holdings of less than 1 ha.

Public forests:

Distribution per size class based on the total surface areas of holdings governed by the forestry regulations (which can therefore contain a proportion of non-wooded surface areas).

* The number of owners for State-owned forests relate to the number of State-owned forests per size class. They all belong to a single owner – the State.

Clarifications: The surface areas presented here are "land" areas (which can therefore contain a proportion of non-wooded areas: bodies of water, paths, etc.) and which can differ from strictly forest areas as inventoried by IGN.

6.1.b. Breakdown of private holdings per type of manager

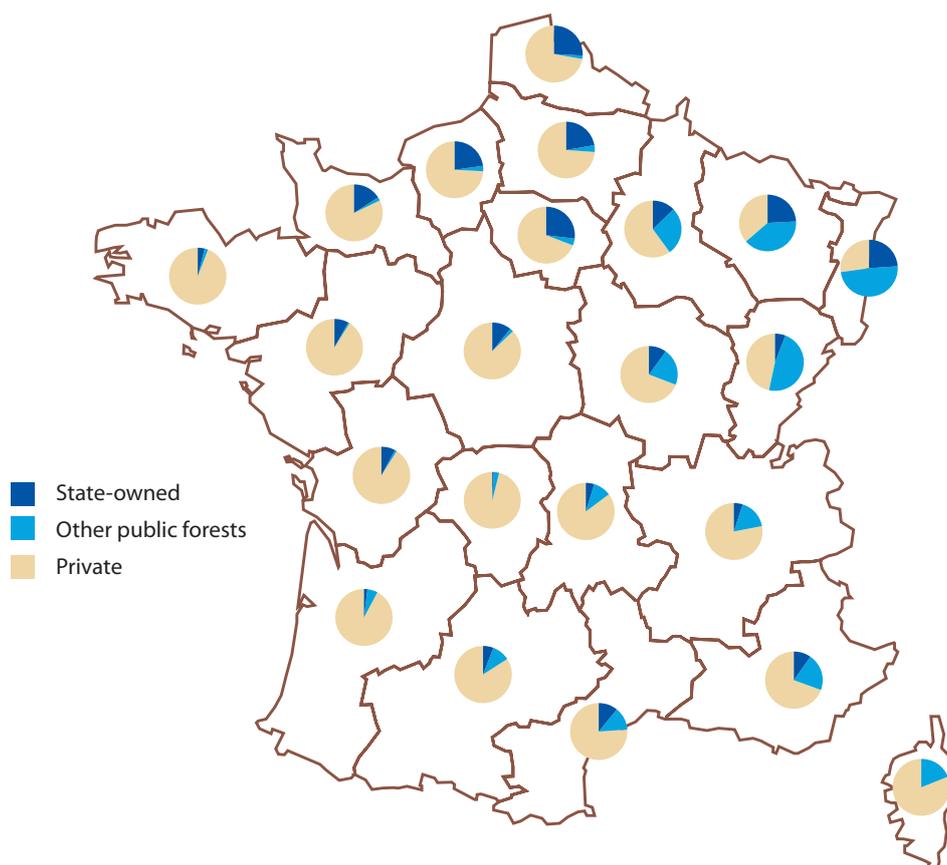
		2009	2012	2013	2014
UCFF	surface area (ha)	1,965,000	1,988,141	2,018,174	n.a.
	number of owners	99,843	113,031	108,000	n.a.
Cniefeb	surface area (ha)	n.a.	925,000	n.a.	n.a.
	number of owners	n.a.	n.a.	n.a.	n.a.
SFCDC	surface area (ha)	n.a.	n.a.	n.a.	270,000
	number of owners	n.a.	n.a.	n.a.	n.a.

Sources: National Society of Professional Engineers, Forest Surveyors and Wood Experts (Cniefeb), Caisse des dépôts Forestry Company (SFCDC) and Union of French Forest Cooperatives (UCFF)

Clarifications: Some surface areas managed by the Caisse des dépôts Forestry Company are in fact managed by expert members of Cniefeb and the areas can therefore be counted twice for these two managers.

n.a. : data not available

◆ 6.1.c. Proportion of different ownership categories at regional scale



Data source: IGN, national forest inventory

Forest estates and time domains involved:

Years 2008-2012: forest available for wood supply, surveys 2008-2012.

Clarifications:

The public holding categories on Map 6.1.c relate to those in Table 6.1.a. Conversely, for private forests, the categories in Table 6.1.c contain the municipal forests not subject to the forestry regulations which escape the categories in Table 6.1.a.
n.s. : insignificant

■ Analysis

French forests are mainly private (75% private, 9% State-owned and 16% other public forests).

In 2012, 3.3 million owners split between them the 10.4 million hectares of private forest covered by the most recent survey by the Statistics and Forecasting Department (SSP) of the Ministry of Agriculture. These holdings have changed little in their structure since the last decade. Those owning 25 hectares or more hold slightly less than half the surface areas and account for 2% of owners.

In 2014, the 17,000 “public forest owners” split between them 4.6 million hectares of land governed by the forestry regulations (1.4 million hectares of this land are forest, of which 3.8 are likely to contribute to wood production). State-owned forests account for 37% of public forest areas whereas the other forests governed by the forestry regulations account for 63% of surface areas and the large majority of owners. Public forests are larger on average than private forests.

Private holdings (6.1.a)

More than half the private forest area is made up of forest holdings of less than 25 hectares. The average size of these holdings was estimated at nearly 3 hectares in 2012 and has changed little globally since 1999, as it has risen from 2.89 to 3.15 hectares. However, an upward trend seems to be appearing as it was around 2.65 hectares in about 1980. Temporal comparisons do, however, remain tricky given the alterations to the method occurring over the period.

The number of private owners is still very high (3.3 million in 2012), making France well out in front among European countries. Two-thirds of French forest owners (2.2 million in 2012) only possess very small units of less than one hectare, however.

Beyond indications in Table 6.1.a, the SSP survey in 2012 on forest holdings of one hectare and more provides the legal status of private owners. Natural persons are the most numerous, with 94% of owners for 75% of surface areas. Mainly individual owners, they also include communal matrimonial estates, joint- and co-owners.

The very few legal entities (7%) hold one quarter of the surface areas. They cover 31 ha on average (against 7 ha for the natural persons). They include forest management groups that own the largest units with 117 hectares on average.

These figures reflect the high level of private land parceling in France which affects owner involvement in passing on information, especially technical, the unit cost of interventions featuring economies of scale and decisions on active forest management.

Public holdings (6.1.a)

The land status and the application of the forestry regulations to public forests provide them with extensive land protection, thereby limiting the alienations and possibilities of changes in use. These public surface areas placed under the forestry regulations tend to increase on a regular basis.

For State-owned forests, this increase in surface area is explained mainly by:

- the incorporation in the private State-owned forest estate of forests allocated temporarily to ministries other than the Ministry of Agriculture and Forestry;
- exchanges (sometimes between regions) when there is a positive balance: the wooded surface area compensating for land clearance is at least equal to the area of this land clearance and thus helps to increase forest areas;
- the possibility, since 2003, of payments in kind of property inheritance duties with woods and forests (payment in kind which allows a debtor to pay all or part of his debt by transferring the ownership of an asset or group of assets belonging to him);
- the acquisition of forests by the Ministry of Agriculture and Forestry.

Ultimately, an assessment of land transactions shows an increase of 2,800 ha in the State-owned forest area for the 2010-2014 period.

The increase in surface area of municipal forests governed by the forestry regulations is even more significant (21,000 ha). It results from a positive balance between operations placing municipal forests under forestry regulations, by order, and the far more limited leisure operations. There were 15,629 forests of this type in 2014, reflecting the significant number of forest municipalities in the country. This number is tending to increase due to the placing of new municipal forests under forestry regulations and the acquisition policy by certain authorities (departmental and regional councils). Respectively 44% (88.8% of the surface area) and 76% (98.4%) of municipal forests are more than 100 ha or more than 25 ha. The average surface area is 186 ha per forest.

Despite the increase in surfaces between 2010 and 2014 noted above, the State-owned forest areas have globally decreased between 1999 and 2014, with, as a corollary, an increase in municipal forest areas: this

break is mainly due to the Law of 22 January 2002 which transferred the State-owned private forest estate (about 55,000 ha of State-owned forests) to the Corsican regional authorities.

The 1,300 State-owned forests are normally large: 90% of State-owned forests (99.5% of the surface area) are more than 100 ha and their average area is 1,312 ha. This is a historical legacy and fruit of a constant policy to consolidate State-owned massifs.

The public forest heritage under forestry regulations thus normally has large management entities, where efficient sustainable management is possible for the timber sector and in the general interest.

Breakdown of private holdings per type of manager (6.1.b)

Forest cooperatives are major players in private forest management, with 2 million hectares of managed forest (20 hectares on average); the experts also count a large surface area with about 1 million managed hectares (fairly large). The Caisse des dépôts Forestry Company specializes in managing institutional holdings (fairly large); it manages 270,000 ha. These players facilitate forest management.

Spatial breakdown of different holding categories (6.1.c)

French forests (Table 6.1.c) are mainly private (three-quarters private forests to one quarter public forests). They have one of the highest rates in private forest holdings in Europe behind Slovenia, Norway, Denmark and Austria (Forest Europe, 2011). The breakdown of forest holdings, which reflects forestry history and policies, is nevertheless heterogeneous in France:

- forests emanating from former royal and ecclesiastical domains are particularly well represented in the Paris Basin and the North-West and East of the country. There is a very high rate of public forests here, reaching 73% in Alsace;
- land acquired and reforested during the major 19th century developments is concentrated in the Aquitaine coast, Southern Alps and the southern parts of the Massif Central and Eastern Pyrenees: there is a high rate of public forests here.

Public forests are found less frequently in the other French regions. For the past ten years or so, following the transfer of State-owned forests in Corsica to the Corsican regional authority, the flows between each category of holding have remained low. A tendency for forest areas to increase is apparent in each category, in line with the expansion of French forests.

■ Data sources and methodology

◆ Producer of data

6.1.a

- National Forest Office – <<http://www.onf.fr>>
- Ministry of Agriculture, Agrifood and Forests, Statistics and Forecasting Department – <<http://www.agreste.agriculture.gouv.fr>>

6.1.b

- National Society of Professional Engineers, Forest Surveyors and Wood Experts – <<http://www.foret-bois.com>>
- Caisse des dépôts Forestry Company – <<http://www.forestiere-cdc.fr>>
- Union of French Forest Cooperatives – <<http://www.ucff.asso.fr>>

6.1.c

- National Institute of Geographic and Forestry Information (IGN) – <<http://inventaire-forestier.ign.fr>>

◆ Methodology

SSP data

- The 1976-83 SSP survey used as a surveying basis the points of the annual survey on the use of the territory (Teruti) where it was possible to identify the owner. This explains how the surface area has been underestimated (9.7 million hectares against more than 10.3 million hectares listed in 1999 and 2012).
- The SSP surveys of 1999 and 2012 used the land registry as a surveying base, with the owner of 1 ha and more of forests in one department as the statistical unit listed. In addition, the 1999 and 2012 data for the 0 – < 1 ha class taken from the land registry are likely to be under-estimated. This over-estimates the land that is not greatly exploited (wasteland and heathland) to the detriment of land which is exploited more (utilized agricultural area), grasslands and forests (as a guide, the SSP surveys estimated the surface area of private holdings of 1 ha and more at 9.9 million hectares in 1999 and 9.8 million in 2012, against 8.3 million from the land registry on the same dates).
- The class 0 – <1 ha data for 1976-83 cannot be compared with the 1999 and 2012 data, for the 1976-83 survey focused on wooded surface areas of 0.5 ha and more whilst the 1999 and 2012 surveys were conducted without thresholds. In addition, as stated above, the surveys based on the land registry data under-estimate the private forest areas compared with the actual surface area estimated by the IGN forest inventory.

ONF, UCFE, CNIEFFEB and SFCDC data

Data directly from managers.

IGN data

Ownership of a sampling point is defined from the contours of forests governed by the forestry regulations. The National Forests Office provides this information to the forest inventory. Any forest not governed by the forestry regulations is included by default in the private forest category (including public forests not governed by the forestry regulations).

For details on the inventory method:

- IGN, 2014. *Results of the forestry inventory, Methodology, To understand fully the published results*, <<http://inventaire-forestier.ign.fr/ocre-gp/docs/methodologie.pdf>> (consulted on 12 May 2015).
- IGN. *Definitions*, <<http://inventaire-forestier.ign.fr/spip/spip.php?rubrique166>> (consulted on 12 May 2015).

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6.1.1. Integration of forests in local initiatives,

6.1.1.a. Massif development plans (PDM) and territorial forest charters (CFT), in number and surface area

6.1.1.b. Regional breakdown of massif development plans

6.1.1.c. Geographical breakdown of territorial forest charters

Purpose of the indicator

This indicator gives the characteristics of *massif development plans* and *territorial forest charters* in number, number of participating municipalities and surface areas (municipal and forest) involved (6.1.1.a). The regional breakdown of *massif development plans* (6.1.1.b) and *territorial forest charters* (6.1.1.c) is also given.

Forest regions are at the heart of rural area development and organization testifying to the development of *massif development plans* and *territorial forest charters*. They aim to revitalize forest access, land grouping, cover by sustainable management documents and timber mobilization. This indicator reports on the development of these initiatives in the country.

Results

6.1.1.a. Massif development plans (PDM) and territorial forest charters (CFT), in number and surface area

	2011		2012		2013		2014		2015	
	CFT	PDM ¹	CFT	PDM ²	CFT	PDM ²	CFT	PDM ²	CFT	PDM ²
Number	118	307	n.a.	304	132	335	n.a.	381	139	391
Territorial surface area (1000 ha)	10,134	6,852	n.a.	8,696	11,700	9,488	n.a.	11,480	12,800	11,606
Number of municipalities	5,341	n.a.	n.a.	n.a.	6,256	5,052	n.a.	7,638	6,800	7,786
Forest area (1000 ha)	4,160	2,561	n.a.	3,132	4,790	3,372	n.a.	4,000	5,000	4,137
... including private forest		1,826	n.a.	2,191	3,257	2,377	n.a.	2,775	3,400	2,906
Afforestation rate (%)	41	37	n.a.	36	41	36	n.a.	35	56	36

Sources: FNCOFOR, CNPF, Irstea

PDM¹: PDM source 2011: Irstea, as per the national assessment in 2010 (Sylvain Chabé-Ferret, Arnaud Sergent, Irstea, final report published in March 2012).

PDM²: PDM source from 2012 onwards: CNPF, as per the internal file consolidated under the State/CNPF goals and performance contract 2012-2016.

Clarification: Data at 1 January of each year.

n.a. : data not available

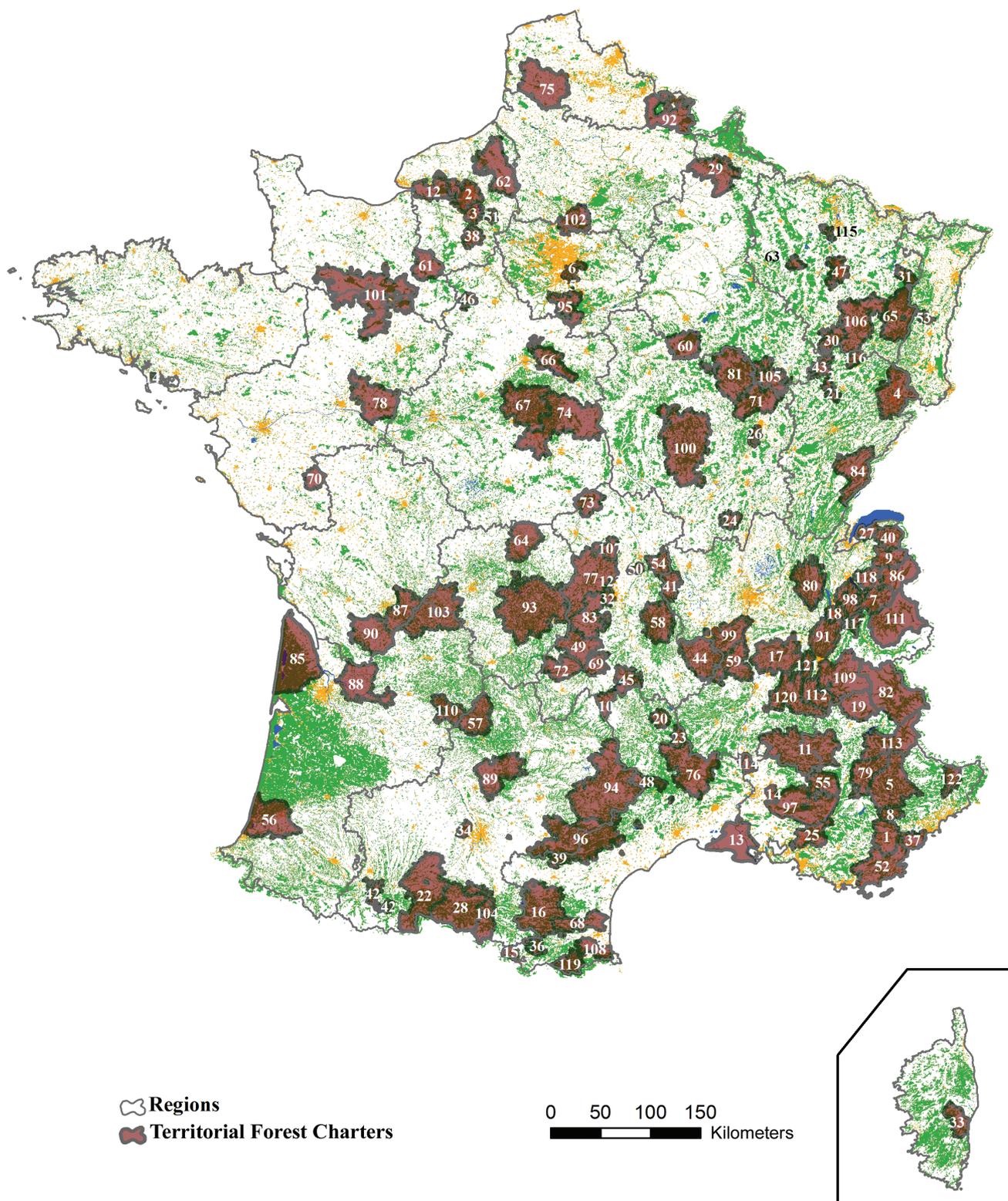
◆ 6.1.1.b. Regional breakdown of massif development plans

2015									
CNPF regions (re-regional CNPF delegations)	Number of PDM	Surface area of territory involved	Forest area involved	... including public forest area	... including private forest area	Average private forest area	Number of private owners involved	Number of municipalities involved	Afforestation rate
		1000 ha				ha			
Aquitaine	12	1,930	603	180	423	4.0	105,229	1,522	31%
Auvergne	50	1,074	335	57	278	2.9	97,426	503	31%
Burgundy	4	611	255	99	157	3.9	40,342	611	42%
Brittany	6	328	60	4	56	1.4	39,576	124	18%
Champagne-Ardenne	39	1,483	436	158	278	2.3	119,591	1,156	29%
Corsica	2	2	1	0	1	1.7	500	3	50%
Franche-Comté	10	135	72	28	44	3.2	13,827	120	54%
Île-de-France-Centre	1		3		3	1.3	2,245		
Languedoc-Roussillon	13	291	209	54	154	5.2	29,712	145	72%
Limousin	5	391	180	12	168	4.0	41,755	7	46%
Lorraine-Alsace	17	n.a.	138	69	69	1.4	49,991	110	n.a.
Midi-Pyrénées	32	831	224	38	186	3.3	56,948	257	27%
Nord-Pas-de-Calais-Picardie	21	1,224	224	90	134	3.4	39,757	2,003	18%
Normandy	6	298	79	38	41	6.1	6,661	154	26%
Pays de la Loire	2	131	24	10	14	2.1	6,755	71	19%
Poitou-Charentes	40	398	64		64	1.8	35,969	201	16%
Provence-Alpes-Côte d'Azur	44	1,201	648	239	410	5.1	79,628	135	54%
Rhône-Alpes	87	1,142	581	155	426	2.5	167,684	664	51%
Total	391	11,606	4,137	1,231	2,906	3.1	933,596	7,786	36%

Source: CNPF, PDM indicator, as per ACTIV 2 summary of 15 April 2015.

Clarification: Data at 1 January of year cited.

◆ 6.1.1.c. Geographical breakdown of territorial forest charters



Data source: Corine Land Cover, 2009. Geofla®, IGN. Territorial forest charters, FNCOFOR, 2015.
 Clarification: Situation in Autumn 2014.

■ Analysis

The development of *massif development plans* (PDM) and *territorial forest charters* (CFT) testify to the importance of forest lands in developing and organizing rural areas. The *massif development plans* have been highly successful, with nearly 390 introduced since the 2000s. They involve some 930,000 owners for a private forest area in the order of 2.9 million hectares. The *territorial forest charters* have also expanded hugely. Nearly 140 CFT were listed in 2015, covering the territory of 6,800 municipalities for a forest area of 5 million hectares (68% privately owned). One CFT focuses on all or part of the forest-timber sector in a given territory (country, regional nature park, intermunicipality). The PDM mainly focuses its operations on private forests. The two initiatives do not run concurrently and can easily be connected, or even precede each other in a same territory (40% of the private forest area under a PDM is also covered by a CFT).

Massif development plans (PDM)

Presentation

The *massif development plans* are territorial initiatives to raise awareness of and call on owners to apply sustainable forest management in massifs insufficiently affected until now by forest development and logged. It is one of the instruments encouraged by the State (Law on the modernization of agriculture and fisheries of July 2010) under local forest development strategies (SLDF).

The massif development plan initiative is based on diagnostic work per massif (5 to 7,000 ha on average for private forests alone) followed by discussions with the forest owners and other regional players to propose and execute forest improvement operations appropriate to the specific context of the massive.

As a territorial development instrument, the *massif development plan* is clearly part of a long-term initiative, with actions and effects that will endure long beyond the completion date. Two-thirds of *massif development plans* are deemed to have been completed, but this does not for all that mean a halt to forest development dynamics.

The *massif development plans* are mainly set up in regions with a high proportion of forests with little, if any, management (very fragmented parceling, difficult access, insufficient road network, etc.), more often than not in mountain and medium mountain areas. The Rhône-Alpes, Auvergne and Provence-Alpes-Côte d'Azur alone account for nearly 50% of all massif development plans introduced (see **6.1.1.b**).

They have been highly successful as a rural organization instrument, echoing the interest shown by the regional authorities. Nearly 390 massif development plans have been introduced and monitored by CNPF throughout France since the 2000s, in close partnership with the forest managers: cooperatives, forestry experts and independent forest technicians. They have brought into contact (letters, telephone calls, meetings, visits, etc.) some 930,000 owners for a private forest area in the order of 2.9 million hectares. The PDM actions relate to the development of sustainable management documents

(concerted simple management plans, Codes of Best Forest Practice, etc.), timber mobilization, access, land grouping, extension services, etc. as well as more "societal" forest functions like preservation of the biodiversity, public access, water quality, etc. After fifteen years in existence, the *massif development plans* are now proving to be a natural extension for the *forest economic and environmental interest groupings* (GIEFF); these are new collective forest management instruments at the scale of the massif set up by the Law for the Future of Agriculture, Food and the Forest of 13 October 2014.

Main lessons

The national assessment entrusted to Irstea by the Ministry of Agriculture (final report published in March 2012) concluded that PDM were beneficial, especially in terms of:

- extension services and forestry advice. As at 31 December 2014, more than 860 technical meetings attended by 18,700 participants and nearly 10,400 diagnostic visits had mobilized new owners, including some who joined professional forestry organizations (cooperatives, unions, etc.);
- development of sustainable forest management documents. In Rhône-Alpes, for example, a 10% rise in the surface area under a simple management plan was mainly the result of a dynamic PDM;
- improvement of access and forest land, two essential prerequisites to ensuring lasting access to sustainable forest management.

It is more difficult to assess the influence of *massif development plans* on the massification of the harvest given the very patchy information on volumes actually logged. One significant effect is however apparent in Auvergne, with an estimated additional harvest of 6 cubic meters per hectare per year.

Lastly, some PDM result directly in new owner associations (ASA, ASGF, etc.) or silviculturist groups (uniting up to 150 owners in some cases) likely to become GIEFF subsequently, involving a single grouped PSG per massif.

Territorial forest charters (CFT)

Presentation

Territorial forest charters are development and sustainable development instruments for rural areas used to include forests more in their social environment and thus setting out the multifunctional role of the forest. Whether this involves economic (timber production, local timber sector, etc.), social (tourism, land, etc.) or environmental (biodiversity, landscape, etc.) issues, the *territorial forest charter* aims to meet the specific local expectations from promoting forest spaces and also the local timber sector. It is a strategic initiative which is turned into reality by an operational action program.

The *territorial forest charters* were created by the Forest Law of 9 July 2001 (Article L12 of the Forest Code) and have been attached to the *local forest development strategies* since 2010. Initiated locally, they have proved highly successful, most frequently in intermunicipalities (which sponsor 32% of projects), countries or territorial and rural balance centers (PETR, MAPAM law of 27 January 2014, 32% also) or *regional nature parks* (19%). They are based on a consultation instrument between local players to prepare a shared diagnosis and action plan around forest-timber issues in the territory. The charter fosters encounters between private or public forest owners, users of the resource (local authorities, economic operators, public establishments, forest user associations, environmental protection associations, State) and professionals (businesses in the sector and foresters). CFT carry out actions relating to a variety of fields. There are, however, a few stand-out themes:

- processing and waste-to-energy conversion of wood accounts for about 20% of all actions (awareness-raising but also creating wood storage platforms, even wood boiler rooms, setting up of territorial supply plans);
- mobilization and trading of timber accounts for 19% of all actions (installing access schemes and routes, support for forestry work businesses, production of massif development plans in private forests, etc.);
- monitoring, organizing and assessing accounts for 18% of actions (coordination of actions in the CFT program by the charter's prime contract, cross-disciplinary communication, etc.);
- lastly, the "leisure and tourism" and "environment" themes are also illustrated and highlight the specific features of forest charters, a cross-disciplinary approach to multi-functional enhancement of the forest in a territory.

FNCOFOR is responsible for monitoring and networking *territorial forest charters*. Nearly 140 *territorial forest charters* were listed in 2015, covering the territory of 6,800 municipalities for a forest area of 5 million hectares (68% privately owned).

Main lessons

A national assessment of *territorial forest charters* has demonstrated their advantage; they have highlighted success factors for the territories involved and suggested a few avenues for reflection on improving them:

- the importance of organization for the project dynamics and consistency of actions;
- political backing for the initiative;
- the nature of the support structure (with major engineering to mobilize sundry skills);
- links with other territorial development dynamics.

The territorial organization of CFT has a lever effect, as one euro spent brings nine investment euros to the territory (assessment in 25 representative and active CFT territories).

■ Data sources and methodology

◆ Producer of data

National Forest Property Center (CNPF) – <<http://www.cnpf.fr>>

CNPF ACTIV database, national summary of indicator 1.3.a “PDM” as at 15 April 2015.

National Federation of Forest Municipalities – <<http://www.fncofor.fr>>

◆ Methodology

PDM

The data are entered by each regional CNPF delegation in a specific online database called ACTIV. All information characterizing the *massif development plan* is entered here: name of the PDM, department, start year, progress made, global envelope (ha), private forest area, number of forest owners involved, number of municipalities involved, PDM goal, number of extension meetings held, number of participants, number of technical visits made, private forest area actually visited, etc. A national summary is produced every year in March of year n+1 for the year n activity report.

CFT

The data produced are based on the *territorial forest charter* project monitoring activity by the national *territorial forest charter* network, in partnership with the players and the Ministry of Agriculture and Forestry which supports their preparation. The *territorial forest charters* are then contacted individually and provide information based on declarations relating to their perimeters, forest areas, objectives etc. using a standardized form. These data are publicized with the consent of their owners under the heading specific to the network on the FNCOFOR site (heading “find out about the *territorial forest charters*”). The data are aggregated and uploaded online every year.

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Authors: Alain Colinot (CNPF), Alice Seque-Weill (FNCOFOR) and Claire Montagné-Huck (Lef, Inra-AgroParisTech)

6.1.2. Training in the forestry sector

6.1.2.a. Training courses in the forestry sector: diploma courses and owner training

BOX 6: Information, awareness-raising, extension: essential supplements to forest owner training

Purpose of the indicator

This indicator presents the number of initial or adult training diplomas (professional certificate, professional agricultural fitness certificate, professional bac, higher agricultural technician certificate) and the number of owners trained (non-diploma training), both private or elected representatives from authorities (6.1.2.a).

Training in the forestry sector provides information on the appeal of the profession and the potential entry in the job market for personnel trained to work in the field as well as on the training efforts made and the motivation of forest owners. The awareness-raising and extension and the more formal training ("FOGEFOR") of private forest owners is a chance for voluntary forest owners to acquire the bases and broader knowledge that are essential to manage their forests responsibly and sustainably. The number of elected representatives of forest municipalities trained gives information on the wish of elected representatives in rural municipalities to include the forest as a genuine driving force in developing their territory.

Results

6.1.2.a. Training courses in the forestry sector: diploma courses and owner training

	2010-2012	2013-2014
Diploma courses for future professionals (number of graduates/year)	1,166	1,205
... including awarding through exam	904	868
<i>Bac pro, forest*</i>	495	441
<i>BTSA, forest management**</i>	259	298
<i>CAPA, forestry work – logging</i>	111	84
<i>CAPA, forestry work – silviculture</i>	40	44
... including awarding through course credit	262	337
<i>Professional certificate, forest work</i>	33	3
<i>Professional certificate, forest site manager</i>		78
<i>Professional agricultural certificate, forestry work – operating forestry machinery</i>	40	69
<i>Professional agricultural certificate, logging work</i>	100	118
<i>Professional agricultural certificate, forestry work, silviculture work</i>	19	18
<i>CAPA, forestry work – logging</i>	54	39
<i>CAPA, forestry work – silviculture</i>	16	12
Non-diploma courses for owners (number of owners trained/year)	3,716	3,908
... including private owners (Fogefor only)***	865	902
... including elected representatives from forest municipalities	2,851	3,006

Sources: *Maaf* (diploma courses), *CNPF-FPF*, Fogefor training department and national cell (private owner course), *FNCOFOR-IFFC* (courses for elected representatives of forest municipalities).

Forest estates and time domains involved:

Diploma courses through exam:

Years 2010-2012: average terms 2011-2012.

Years 2013-2014: average terms 2013-2014.

Diploma courses through course credit:

Years 2010-2012: terms of year 2010.

Years 2013-2014: terms of year 2013.

Non-diploma courses for private owners:

Years 2010-2012: average of years 2005-2009, FOGEFOR course exclusively (2 to 10 days).

Years 2013-2014: average of years 2010-2014, FOGEFOR course exclusively (2 to 10 days).

Non-diploma courses for elected representatives of forest municipalities:

Years 2010-2012: number of elected representatives trained in 2010, 90% of courses last for six hours.

Years 2013-2014: number of elected representatives trained in 2014, 90% of courses last for six hours.

Clarifications:

* From 2012, the bac pro has been overhauled and its name changed.

The 2012 bac pro term examined youngsters from 3rd year in 2008 who had taken the two-year BEPA course and two-year bac pro and also youngsters from third year in 2009 who had studied for the bac pro over three years from the second professional year: there was therefore a "double flow" of candidates for this year which increased the average.

** The forest management BTSA was overhauled for 2013; candidates in the 2013 term had exceptionally the chance to take their exams during the June term and in the September term if put off in June, which increased admission numbers and the success rate.

*** Fogefor only, excluding technical and education days by the CRPF and progress groups (CETEF, GDF, etc.) for the benefit of forest owners.

BOX 6: Information, awareness-raising, extension: essential supplements to forest owner training

Knowledge is not transferred to forest owners through training courses alone. The *National Forest Ownership Center* (CNPF) differentiates between several other forms of transfer.

Bulk information

This involves broadcasting general basic information essential to all forest owners (who does what in the sector, management and silviculture outlines, tax and regulatory changes, etc.). The information is broadcast via the CNPF Internet sites, e-newsletters and regional magazines. All these media reach several hundreds of thousands forest owners every year.

CNPF lists the following in its activity report for 2014 alone:

1,538,000 connections to its Internet sites (regional sites for the Regional Forest Ownership Centers (CRPF) and the national site <<http://foretpriveefrancaise.com>>), including 538,000 which can be allocated to just forest owners, i.e. 49% of those owning more than one hectare.

- 215,960 recipients of its regional magazines (including the national *Forêt entreprise* magazine) and e-newsletters.

Awareness-raising and extension

This involves targeted, detailed inputs in all the registers necessary for sustainable management and silviculture: economic, technical, regulatory, fiscal, etc.

These inputs occur mainly via:

- extension meetings organized specifically by CNPF for forest owners in a given geographical sector (municipality(ies), massif(s), canton(s), etc.): average of 495 meetings/year for 14,595 attendees/year in the period 2010-2014;
- themed meetings of the *Forest Technical Study and Experimentation Centers* (CETEF), forest development groups, private forest associations on behalf of their members and with the contribution of the CNPF: average of 230 meetings/year for 9,100 attendees/year in the period 2010-2014;
- individual technical support provided by the CNPF officers at the request of forest owners in monitoring their sustainable management document(s) (*Codes of Best Forest Practices*, simple management plans, etc.) or for special technical needs (tree dieback, educational demonstrations, etc.): average of 7.780 field visits/year in the period 2010-2014.

Instructor training

This mainly involves courses organized and run by the Forest Development Institute as part of its training catalog or as customized courses requested by this or that body. These courses are not normally intended directly for forest owners but more for their managers and other service providers (cooperatives, forest experts, independent consultants, etc.) as well as other players involved earlier in the sector (scientists, environmentalists, agricultural consultants, more rarely businessmen, etc.). The average is 31 courses/year (catalog and customized) for 511 attendees/year in the period 2011-2014. This datum could increment the main indicator, but has been discarded for reasons of simplification.

■ Analysis

Between 2010 and 2014, training in the forestry sector has tended to rise both in terms of diploma and non-diploma courses for owners; however, initial training courses are showing a slight drop in graduates unlike adult courses.

The diversity of the French forest environment and the many uses of the wood material fuel a wide range of trades. Overall, these trades include: those linked directly to the forest (logger, businessman, machinery driver, forest technician, forestry engineer,

etc.), traditional woodworking trades (sawyer, carpenter, timber constructor, timber engineer, joiner, cabinetmaker, etc.) or arts and crafts (picture framer, stringed instrument maker, inlayer, sculptor, cooper, etc.). The following trades can be added to this non-

exhaustive list: paper manufacture, use of fuelwood, marketing of timber and by-products and public administration and research linked to the forests and wood (see <http://www.metiers-foret-bois.org> for an overview of forest- and wood-related trades and training).

Monitoring the initial or on-going training of part of these trades gives a proactive look at the dynamics and appeal of the sector.

Diploma courses

The current construction of the indicator means that it only lists the training courses relating to forest management activities (forest bac pro, forest management BTSA, forest work CAPA). Although the statistical series of the indicator (6.1.2.a) is fairly short and the workforce in question fairly low, the total number of graduates increased between 2010 and 2014. The number of initial training graduates is dropping slightly whilst the number of adult training graduates is rising. This may perhaps show ignorance of these trades and a lack of appeal for young people and at the same time the effect of regional policies and a passion for these trades in terms of reconversion or specialization in relatively forest areas. People interested in these courses tend not to be mobile and seek to enter a very local job market.

The downward trend for initial training graduates goes hand in hand with a drop in students registered in second level agricultural education and apprenticeships (Ministry of Education, Higher Education and Research 2015). At the same time, Indicator 6.5 on employment in the sector also shows a drop in workers in the silviculture sector and logging.

Training for private owners

The CNPF takes an active role in training forest owners though the FOGEFOR system (French acronym for Forest Management Training). It organizes and runs courses and helps to monitor training course agreements and financing through the FOGEGOR National Cell.

Participation in courses, which last from two to ten days according to the type, is voluntary. They are intended for owners who wish to become more involved in managing their forest holdings. Owners can thus move from the status of a more or less passive owner to that of a more informed and more active owner-producer. They contribute to the emergence and renewal of private forest managers.

Every FOGEFOR training course combines both theoretical inputs and practical work. Depending on their level and needs, forest owners can opt for:

- basic or initiation cycles, covering all aspects of forest management (a dozen or so training days spread over a ten- to fifteen-month period);
- specialist cycles (in-depth knowledge, professionalization, improvement) targeting

a particular topic (four to six training days over a shorter period). They have provided the basics of cycles executed since 2010. The topics most subscribed to are, in decreasing order of importance: forest holding management (planning, tax regime, administration, etc.), silviculture and stand renewal, timber harvesting and marketing, unusual environments and biodiversity.

Since their creation in 1983, FOGEFOR have trained more than 22,800 private foresters for a total of 1,077 courses. The dynamics of these last five years have been sustained with an increase of some +10% in number of courses and +4% in number of attendees.

Training of elected representatives from forest municipalities

Training elected representatives is a core mission for forest municipalities and is a major strategic issue in passing on messages to elected representatives, meeting their expectations and initiating territorial project dynamics around the forest. The forest municipality network offers a variety of training options in the regions appropriate to local contexts to turn the timber sector into a territorial development asset.

More than 3,000 elected representatives attended the courses on offer in 2014. This figure seems to have risen between 2010 and 2014, but it is tricky to comment on this change as, for accuracy, the cumulative effect of staff trained in previous years and the arrival of new elected representatives must be considered.

Training courses operated by the forest municipalities are financed by the European fund, EAFRD, the network's own financing and sometimes by regional grants.

Courses normally last six hours, with half the time spent in the classroom and the other half on practicals (in forest, in a timber company, etc.).

Sample topics addressed in 2014:

- "Elected representatives, forest, timber: the basics for action": to provide new elected representatives with the keys to making enlightened decisions about the forest in their municipality and raise their awareness to taking the forest into account in developing their territory;
- "Firewood for the private individual": training which affects estovers and transfer;
- "Fuelwood", "construction timber", "timber sector": where the timber is used in a short distribution channel;
- "Roads and access": essential for moving the timber;
- "Clearing undergrowth": connected to the obligations of elected representatives in firefighting;
- etc.

Other on-going training bodies

Other bodies like ONF, the CRPF, cooperatives, AgroParisTech, etc. hold on-going training sessions for a variety of audiences (for example, 624 training days given in 2015 for forest cooperation). It was impossible to compile quantified information on these courses for this edition of the Indicators for the Sustainable Management of Metropolitan French Forests.

■ **Data sources and methodology**

◆ **Producer of data**

Ministry of Agriculture, Agrifood and Forestry – <<http://agriculture.gouv.fr>>

National Forest Property Center – <<http://www.cnpf.fr>>

National Federation of Forest Municipalities – <<http://www.fncofor.fr>>

◆ **Methodology**

Diploma courses

Statistics for the Education Statistics Department at the Ministry of Agriculture.

For this first test to list diploma courses in the forestry sector, the compilation of data has focused on level one courses: professional certificate, professional agricultural fitness certificate, professional bac and higher agricultural technician certificate. The plan for the next edition of the sustainable management indicators is to broaden the field of courses considered (provided data are available).

Training for private owners

Data about the FOGEFOR courses are monitored by the national FOGEFOR cell. All data that characterize actions are recorded here: dates, types, titles, durations, identities of instructors and those involved, number of participants, etc. A national summary is produced every year in March of year n+1 for the year n activity report. In addition, data relating to the information, awareness-raising and extension actions for forest owners are entered by each of the CNPF regional delegations in an accessible online database called ACTIV. They are presented in Box 6.

Training of elected representatives from forest municipalities

The regional unions of forest municipalities roll out the training courses in their territory and record all the data: data, place, duration, number of participants, identity of instructors, etc. An attendance sheet is signed at each course.

FNCOFOR summarizes all this information to report on the training given to the network of forest municipalities.

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FNCOFOR, 2015. *Activity report 2014*, FNCOFOR, Paris, 35 p.

6.1.3. Voluntary sustainable management certification initiatives

6.1.3.a. Forest area per category of ownership, number of owners and loggers certified for sustainable management

Purpose of the indicator

Indicator **6.1.3.a** provides information on:

- the number of certified public and private forest owners in France,
- the certified public and private forest areas in France,
- the number of logging companies and sawmills with a certified control chain.

Sustainable forest management in France is defined by the Forest Code, which offers sustainable management documents approved by the public authority which provide sustainable management guarantees. Sustainable management certification, as it is understood here, comes from a voluntary process of adhering to one or more systems which display management compliance with standards defined by labels on the products, whilst committing to maintaining or improving it to benefit in return from better market conditions. Certification in France is currently granted by two bodies, FSC and PEFC.

This indicator provides information on progress over time of voluntary commitments in both the PEFC and FSC certification schemes.

Results

◆ 6.1.3.a. Forest area per category of ownership, number of owners and loggers certified for sustainable management

	2002	2003-2007	2008-2012	2013	2014	
PEFC	Certified surface area (1000 ha)	791	4,577	5,223	5,558	5,675
	...including State-owned forest	491	1,557	1,571	1,714	1,714
	...including other public forests	n.a.	1,386	1,495	1,539	1,637
	...including private forest	299	1,635	2,156	2,316	2,324
	Number of certified owners	1,657	23,214	52,137	59,515	62,913
	Number of loggers	30	301	321	311	297
	Number of sawyers and loggers-sawyers	12	485	575	592	597
FSC	Certified surface area (1000 ha)	18	17	18	19	28
	...including State-owned forest	n.a.	n.a.	n.a.	n.a.	0
	...including other public forests	n.a.	n.a.	n.a.	n.a.	7
	...including private forest	n.a.	n.a.	n.a.	n.a.	21
	Number of certified owners	n.a.	n.a.	n.a.	n.a.	n.a.
	Number of loggers	n.a.	n.a.	n.a.	n.a.	n.a.
Number of sawyers and loggers-sawyers	n.a.	n.a.	n.a.	n.a.	n.a.	

Sources: PEFC France, FSC France

Clarifications: Metropolitan France, data at the end of the period cited.

Inasmuch as certain owners have opted for both PEFC and FSC, the surface areas from both types of certification cannot be added together.

n.a. : data not available

■ Analysis

The sustainable forest management certification systems were developed in the early 2000s in France. Over half the national forest areas have been certified for their sustainable management in fifteen or so years. These certifications go beyond official guarantees by ensuring sustainable forest management for the consumer – environmentally-friendly, socially beneficial and economically viable. The entire supply and distribution chain must be certified to offer a certified product to the end consumer.

FSC certification

FSC (Forest Stewardship Council) is a non-profit-making international NGO. Created in 1993 following the Rio Earth Summit, its aim is to promote worldwide sustainable forest management. The governance of the certification is based on three panels dealing with the three questions of environmental, economic and social quality and performances. FSC certification is based on a commitment and practices already applied under a forest management plan and imposes an initial quality level on the forest.

FSC-certified surface areas in France are a fairly recent development. Although the total surface area is still small, especially when compared with our European neighbors, the growing interest in this certification scheme is reflected in the continuous increase of surface areas during the last two years and the appearance of new certificates. Adapting the FSC forest management standard to national requirements currently in progress will provide owners and managers with a more appropriate framework for the national context and facilitate the increase in certified surface areas.

PEFC certification

PEFC (Program for the Endorsement of Forest Certification Schemes) is a non-profit-making international NGO. PEFC was created by European forest owners in 1999 and opened up its certification system outside Europe in the 2000s. The organization aims to promote sustainable forest management. PEFC certification is based on a governance process between all stakeholders involved in sustainable forest management: producers, processors and users. PEFC certification is granted on the basis of a commitment to continuous improvement in forest management.

As at 31 December 2014, there are 63,000 owners belonging to the PEFC system in France (i.e. an increase of 3,100 members over 2013) and more than 5.6 million ha of PEFC-certified forests. The number of PEFC-certified logging companies and sawmills has remained globally stable in 2014.

■ Data sources and methodology

◆ **Producer of data**

FSC France – <<https://fr.fsc.org>>

PEFC France – <<http://www.pefc-france.org>>

◆ **Methodology**

Data from bodies issuing labels.

Authors: Stéphane Marchesi (PEFC France) and Guillaume Dahringer (FSC France)

6.2. Formation of the added value of the forest-timber-paper-furniture sector

6.2.a. Added value per branch and contribution of the forest-timber-paper-furniture sector to the gross domestic product

6.2.a.1. Changes in added value per branch

Purpose of the indicator

Added value is an economic indicator which measures the value or wealth created by a sector of activity during a given period. It is defined by the difference between the final production value (turnover) and the amount of goods consumed during the production process (intermediate consumptions).

It can assess directly the economic weight of a sector within all the wealth created in the country during the reference period, which constitutes the gross domestic product (GDP). Indicator 6.2 focuses on how the added value is formed by subtracting the amount of the production from that of intermediate consumptions (6.2.a and 6.2.a.1). The breakdown of this added value between investment, employees' salaries, the State, the financial institutions and the shareholders is the purpose of Indicator 6.3.

Results

◆ 6.2.a. Added value per branch and contribution of the forest-timber-paper-furniture sector to the gross domestic product

		1999-2002	2003-2007	2008-2012
		<i>billion euros 2014/year</i>		
Silviculture and logging	Production (1)	5.28	5.04	5.00
	Intermediate consumption (2)	2.33	2.61	2.68
	Gross added value (=1-2)	2.95	2.43	2.32
Woodworking and manufacture of wooden items	Production (1)	12.50	12.59	11.09
	Intermediate consumption (2)	8.74	9.17	7.94
	Gross added value (=1-2)	3.76	3.42	3.15
Paper and paperboard industry	Production (1)	23.05	20.74	17.92
	Intermediate consumption (2)	16.07	14.89	13.48
	Gross added value (=1-2)	6.98	5.85	4.45
Manufacture of wooden and non-wooden furniture	Production (1)	9.75	9.25	7.43
	Intermediate consumption (2)	5.93	5.76	4.85
	Gross added value (=1-2)	3.83	3.50	2.58
Total wood sector	Production (1)	50.59	47.62	41.43
	Intermediate consumption (2)	33.06	32.42	28.94
	Gross added value (=1-2)	17.53	15.20	12.49
	Contribution to the GDP (%)	0.94	0.75	0.59

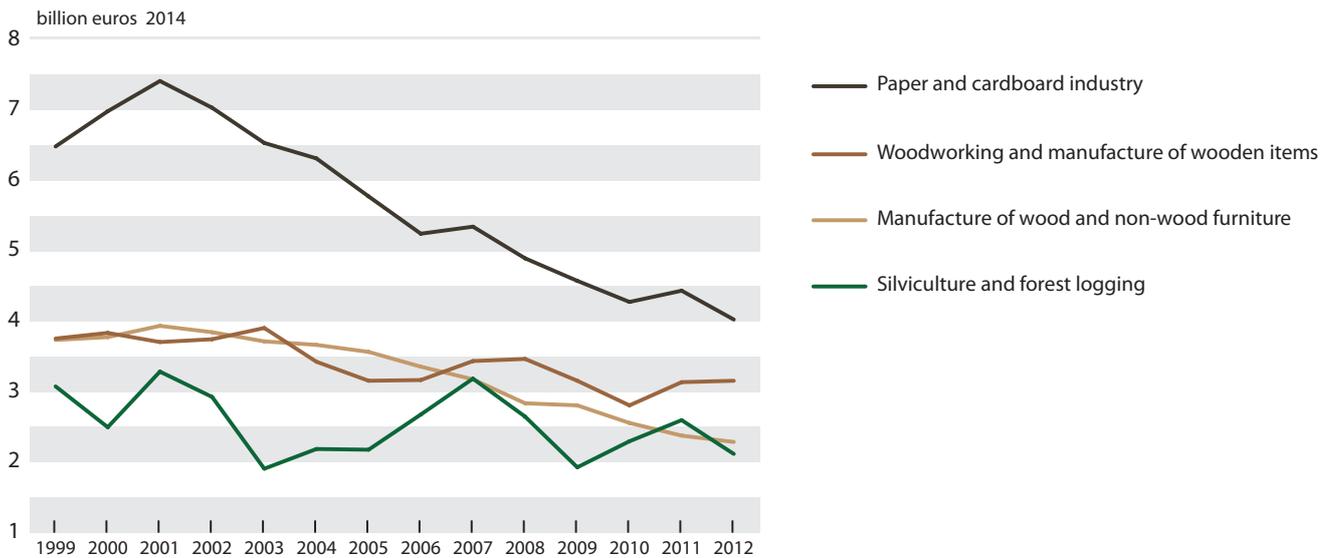
Sources: National Institute of Statistics and Economic Studies (Insee) – National accounts base 2010.

Clarifications:

The values are the average of annual data in the different periods.

The contribution to GDP is here an average of ratios rather than a ratio of averages.

◆ 6.2.a.1. Changes in added value per branch



Sources: National Institute of Statistics and Economic Studies (Insee) – National accounts base 2010.

Clarifications:

The values are the average of annual data in the different periods.

The contribution to GDP is here an average of ratios rather than a ratio of averages.

■ Analysis

The performances (and their changes) of various branches in the sector are fairly mixed in terms of added value (VA) and there is overall a downward trend in the contribution by the sector to the national wealth (share of GDP). The contribution of the sector to the national wealth (GDP) dropped from nearly 1% to scarcely more than 0.5% between 1999 and 2012.

The French forest-timber-paper-furniture sector (silviculture and logging, woodworking and manufacture of wooden items, paper and paperboard industry and manufacture of furniture) generated nearly 12 billion euros of added value in 2012 (6.2.a). Silviculture and logging account for 18% of the added value created, furniture manufacture accounts for 20%, woodworking 27% and the paper and paperboard industry 35% (6.2.a). The forest-timber-paper-furniture sector accounts for about 0.6% of the total added value and the gross domestic product (GDP) of France, which makes it relatively insignificant in the national economy (6.2.a).

The commercial and non-commercial sectors contribute the most to the national wealth in France (55% and 23% respectively of the total added value in 2012), whilst industry (including paper and paperboard), construction (including timber) and agriculture (including silviculture and fishing) account for 14%, 6% and 2% respectively (source Insee).

By way of comparison, the forest-timber-paper (excluding furniture) sectors in Finland, Sweden and Latvia account for over 3% of the national GDP. This contribution is about 2% and 1.5% respectively in Austria and Portugal and nearly 1% in Germany. Thus, France, despite its extensive afforestation, lies at the

tail end of European countries for this contribution which is clearly below the European average (around 1%) and close to the United Kingdom and Ireland which are both substantially less wooded (State of Europe's Forests, 2011).

The added value of the French forest-timber-paper, sector which was rising in the early 2000s, has since shown a clear downward trend, from more than 18 billion euros (2001) to less than 12 billion euros (2012), i.e. a drop of nearly 35%. Similarly, its contribution to the GDP drops from nearly 1% to scarcely more than 0.5% (6.2.a). The paper and paperboard industry and furniture manufacture are the activities with the largest drop in added value. Woodworking and the manufacture of wooden items show a more moderate decline, whereas silviculture and logging have fluctuated more. This is probably a reflection of climate events (storms) and global economic conditions (crises) along with a certain ability to adapt to changes in this branch (development of the energy part of the sector, for example – see Indicator 6.9), (6.2.a.1).

The decline in added value in the paper and paperboard industry seems fairly general throughout the European Union, whereas changes in silviculture, logging and woodworking vary more between the countries: drop in Western and Northern Europe, rise in the East (Forest Europe, 2011).

The added value from silviculture and logging in France per cubic meter of marketed timber is €64 2014/m³ in 2013. By way of comparison, it was identical in 2008 (€64 2014/m³) against €70 2014/m³ on average in Europe (Forest Europe, 2011).

The wealth thus produced is then distributed between the employees (salaries), the State (taxes), the shareholders (dividends) and the businesses (investments, development) (see Indicator 6.3).

Note that the results presented in this indicator only reflect the direct contribution by the forest-timber-paper-furniture sector to the gross domestic product. The indicator does not take into account the other forest-related economic activities like tourism, construction or works (insulation, joinery, structural framework, etc.), which are possibly expanding sectors but where the public statistics make no distinction between what falls under forest and wood from other environments or materials. Including these fields of activity could increase the contribution by the forest sector to the national wealth significantly.

■ Data sources and methodology

◆ Producer of data

National Institute of Statistics and Economic Studies (Insee) – National accounts base 2010 - http://www.insee.fr/fr/themes/theme.asp?theme=16&sous_theme=5

◆ Methodology

Added value is defined as the difference between the final production value and the value of intermediate consumptions.

The data used come from the national accounts base 2010 published by the *National Institute of Statistics and Economic Studies* (Insee) All the data used when the *sustainable management indicators 2015* were produced were public and available on the Internet (links as at 30 April 2015). They are:

- production per branch (88 items) at current prices 1999-2012: series 6.101D
<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.1&xml=t_6101d>,
- intermediate consumption per branch (88 items) at current prices 1999-2012: series 6.104D
<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.1&xml=t_6104d>,
- gross added value per branch (88 items) at current prices 1999-2012 (= production – intermediate consumption): series 6.201D
<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.2&xml=t_6201d>,

The publicly-available data are used to calculate this indicator over the period 1999-2012.

The activity branches adopted to qualify the “timber sector” or forest-timber-paper-furniture sector are (in brackets the codes for the French Classification of Economic Activities (NAF-rev2):

<http://recherche-naf.insee.fr/SIRENET_Script/Interrogation/Recherche_par_arbo.html> :

- silviculture and logging (A.88.02);
- manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (C.88.16);
- manufacture of paper and paper products (C.88.16);
- manufacture of furniture (C.88.31).

The gross domestic product also comes from the Insee national accounts: Series 1.105:

<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=1&xml=t_1105>.

For time comparisons, the data have been corrected for inflation and converted into euros 2014 using conversion coefficients provided by Insee.

<<http://www.insee.fr/fr/service/reviser/calcul-pouvoir-achat.asp>>.

Several changes have occurred compared with previous versions of the *sustainable management indicators*. Thus, although the series presented here is totally consistent and uniform, it must not be compared with the data published in the previous versions of the *sustainable management indicators*.

The Insee public data cannot be used to:

- distinguish within the manufacture of furniture the proportion of furniture manufactured from wood from other materials. As a guide, the relative share of the added value of wooden furniture within the furniture sector (which was estimated by the Sessi until 2001) was 61% in 1997 and 64% in 2001. Wooden furniture therefore constitutes a substantial share of the global furniture sector.
- distinguish between the “manufacture of paper pulp and paperboard” and “manufacture of articles in paper and paperboard” sub-branches of the “paper and paperboard industry”. For information, according to the data published in the *sustainable management indicators* in 2010, the relative shares in 2008 of the added value of the “manufacture of paper pulp and paperboard” and “manufacture of articles in paper and paperboard” in all the added value of the paper and paperboard industry were 26.7% and 73.3% respectively.

In addition, it must be noted that the national accounts changed base in 2014, mainly due to the use of the new version of the European accounts system (ESA 2010).

◆ Bibliography

Maaprat, 2010. *Indicators for the Sustainable Management of Metropolitan French Forests*, 2010 edition, Maaprat-NFI, Paris, 200 p.

Forest Europe, Unece, FAO, 2011. *State of Europe's Forests 2011, Status and Trends in Sustainable Forest Management in Europe*, Forest Europe, Unece, FAO, Aas, Norway, 337 p.

Author: Claire Montagné-Huck (Lef, Inra-AgroParisTech)

6.3. Distribution of the added value of the forest-timber-paper-furniture sector,

6.3.a. Distribution of the added value in the sector per branch

Purpose of the indicator

This indicator shows the breakdown of the wealth produced by the business, i.e. its added value (6.2), between the employees (remunerations as salaries and gross wages plus the employer's social contributions), the State (taxes on the net production of operating subsidies) and the business (gross operating surplus, EBE). The gross operating surplus sets the investment policy (consumption of fixed capital) and the financial management (interest to be paid), whilst leaving a remainder – the corporate income (**6.3.a**).

The gross operating surplus first and foremost gives an overview of profits generated by the activity in question. Applied to the turnover or production, it indicates to what extent the costs of the activity are controlled. If the amount of capital invested was known, it could be applied to them to measure the economic profitability of the capital committed and the return on investments made.

Results

6.3.a. Distribution of the added value in the sector per branch

	2009	2010	2011	2012	
	<i>billion euros 2014</i>				
Silviculture and logging	Gross added value	1.93	2.30	2.60	2.12
	Employee salaries	0.93	1.00	0.97	1.02
	Taxes less subsidies	-0.05	0.00	0.00	0.00
	Gross operating surplus (EBE)	1.05	1.31	1.63	1.10
	Fixed capital consumption	n.a.	n.a.	n.a.	n.a.
	Net operating surplus	n.a.	n.a.	n.a.	n.a.
	Interest to be paid	n.a.	n.a.	n.a.	n.a.
	Corporate income	n.a.	n.a.	n.a.	n.a.
Woodworking and manufacture of wooden items	Gross added value	3.16	2.81	3.14	3.16
	Employee salaries	2.58	2.46	2.42	2.42
	Taxes less subsidies	0.20	0.15	0.17	0.17
	Gross operating surplus (EBE)	0.39	0.20	0.55	0.57
	Fixed capital consumption	n.a.	n.a.	n.a.	n.a.
	Net operating surplus	n.a.	n.a.	n.a.	n.a.
	Interest to be paid	n.a.	n.a.	n.a.	n.a.
	Corporate income	n.a.	n.a.	n.a.	n.a.
Paper and paperboard industry	Gross added value	4.58	4.28	4.44	4.03
	Employee salaries	3.26	3.23	3.20	3.12
	Taxes less subsidies	0.34	0.27	0.28	0.28
	Gross operating surplus (EBE)	0.98	0.78	0.97	0.63
	Fixed capital consumption	n.a.	n.a.	n.a.	n.a.
	Net operating surplus	n.a.	n.a.	n.a.	n.a.
	Interest to be paid	n.a.	n.a.	n.a.	n.a.
	Corporate income	n.a.	n.a.	n.a.	n.a.
Manufacture of wooden and non-wooden furniture	Gross added value	2.81	2.56	2.38	2.29
	Employee salaries	2.10	1.97	1.84	1.80
	Taxes less subsidies	0.15	0.12	0.12	0.12
	Gross operating surplus (EBE)	0.56	0.47	0.43	0.38
	Fixed capital consumption	n.a.	n.a.	n.a.	n.a.
	Net operating surplus	n.a.	n.a.	n.a.	n.a.
	Interest to be paid	n.a.	n.a.	n.a.	n.a.
	Corporate income	n.a.	n.a.	n.a.	n.a.
Total wood sector	Gross added value	12.48	11.95	12.56	11.60
	Employee salaries	8.87	8.65	8.43	8.35
	Taxes less subsidies	0.63	0.54	0.56	0.56
	Gross operating surplus (EBE)	2.98	2.76	3.57	2.69
	Fixed capital consumption	n.a.	n.a.	n.a.	n.a.
	Net operating surplus	n.a.	n.a.	n.a.	n.a.
	Interest to be paid	n.a.	n.a.	n.a.	n.a.
	Corporate income	n.a.	n.a.	n.a.	n.a.

Source: National Institute of Statistics and Economic Studies (Insee) via the Forest Economy Laboratory (Lef)

Clarifications: For all branches considered, the data on the breakdown of the gross operating surplus between the fixed capital consumption and the net operating surplus (itself made up of interest to be paid and corporate income) are not available, as the Insee public data do not give this detail.

n.a. : data not available

■ Analysis

Added value is basically used to remunerate the employees (72% for the wood sector limited to the forest-timber-paper-furniture sector), pay all taxes (5%) and form the gross operating surplus (23%) which amounts annually, beyond its fluctuations, to about 3 billion euros. "Silviculture and logging" generates a good third of this surplus whereas it only assumes a modest fraction of total remunerations in the sector (12%). This particular feature is explained by the long immobilization period and the high level of forest standing capital. Silviculture and logging also feature a relatively stable level of total remunerations, unlike all the other branches.

The gross operating surplus of the entire forest-timber-paper-furniture sector is 2.69 billion euros 2014 in 2012. It drops slightly compared with 2011, mainly due to a lower added value. Note that the added value over the period fluctuates upwards and downwards, whereas the payroll is dropping constantly. This continuous drop is seen in all branches, except for silviculture and logging. An analysis of Indicator 6.5 shows clearly that the drop in payroll is explained more by the drop in the number of employees than by the reduction in the average salary.

In 2012, the paper and paperboard sector shows the highest added value and employee remuneration (4.03 billion euros and 3.12 billion euros respectively) whereas silviculture and logging together have the lowest added values and employee remuneration (2.12 billion euros and 1.02 billion euros respectively). However, silviculture and logging show the highest gross operating surplus (1.10 billion euros 2014) whereas the furniture branch only shows 0.38 billion euros of gross operating surplus.

■ Data sources and methodology

◆ Producer of data

National Institute of Statistics and Economic Studies (Insee) – National accounts base 2010. - http://www.insee.fr/fr/themes/theme.asp?theme=16&sous_theme=5

- Added value series: gross added value per branch (88 items) at current prices 1999-2012 (= production – intermediate consumption): series 6.201D
<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.2&xml=t_6201d>
- Employee remuneration series: Employee remuneration per branch (88 items) at current prices (billion euros): series 6.204D
<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.2&xml=t_6204d>
- Gross operating surplus series: Gross operating surplus and gross mixed revenue per branch at current prices (billion euros): series 6.207D
<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.2&xml=t_6207d>

◆ Methodology

To ensure consistency with Indicator 6.2, Indicator 6.3 is presented per branch of activity and calculated using Insee data.

The sources and calculations can therefore be presented as follows (the grayed variables and balances could not be calculated due to a lack of available data):

- Added value** (Insee 88 Items – see Indicator 6.2; period 1999-2012)
 - employee remuneration (Insee 88 Items; period 2009-2012)
 - (taxes – subsidies) (calculation per balance; period 2009-2012)
- = **gross operating surplus + mixed revenue** (Insee 88 Items; period 2009-2012)
 - fixed capital consumption (no detail for 88 items)
- = net operating surplus
 - interest to be paid (no detail for 88 items)
- = corporate income

In the previous editions of *sustainable management indicators*, this indicator only related to the sector upstream (logging companies) and was calculated using forest accounts drawn up by the Lef, IGN and SOeS on behalf of Eurostat. Indicators 6.2 and 6.3 from different sources and methodologies therefore presented different added values for the silviculture sector and logging. Consistency between Indicators 6.2 and 6.3 has been preferred for this edition of *sustainable management indicators* and only data published by Insee have been used. The activity branches adopted to qualify the “timber sector” or forest-timber-paper-furniture sector are the same as for Indicator 6.2.

However, given the lack of detailed Insee data for 88 items for all necessary variables, we have been unable to calculate the indicator both as a whole and as for the entire period considered initially. In addition, the forest accounts commissioned by Eurostat have not been used as they were not available when the *sustainable management indicators* were published. Updated forest accounts should be available during 2016. They will then take into account the new Eurostat requirements (new accounting table format) and the new Insee data calculation base.

The Indicator 6.3 data published in the 2015 version of *sustainable management indicators* cannot therefore be compared with the data of this same indicator published in the previous versions of sustainable management indicators. As all the variables for all the years used in calculating this indicator have been recalculated by Insee on base 2010, the series presented in totally uniform.

For time comparisons, the data have been corrected for inflation and converted into euros 2014 using conversion coefficients provided by Insee.

<http://www.insee.fr/fr/service/reviser/calcul-pouvoir-achat.asp>.

◆ Bibliography

Maaprat, 2010. *Indicators for the Sustainable Management of Metropolitan French Forests*, 2010 edition, Maaprat-NFI, Paris, 200 p.

Forest Europe, Unecce, FAO, 2011. *State of Europe's Forests 2011, Status and Trends in Sustainable Forest Management in Europe*, Forest Europe, Unecce, FAO, Aas, Norway, 337 p.

<http://insee.fr>

Eurostat online glossary (Statistics explained)

http://ec.europa.eu/eurostat/statistics-explained/index.php/Main_Page <consulted on 25/09/2015>

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6.4. State expenditure on forests

6.4.a. Annual State expenditure on forests and services they render

Warning: The State forest expenditure listed in Table 6.4 is not exhaustive. Public aid for forests from regional authorities and European funds are not included.

Purpose of the indicator

This indicator gives State expenditure on forests since 1999, especially to manage them sustainably, protect them against risks (fires) and restore them and also to boost and maintain services rendered by the forests (protection against natural risks, biodiversity, etc.) (6.4.a). It does not contain additions to the State contributions from Europe (for example, rural development aid), financing agencies (mainly ADEME) or territorial authorities (mainly regions and departments). Nor does it address the expenses relating to forestry research.

This indicator is used to comprehend the main budgetary means available to the authorities to operate public policies for forests and the services they render.

Results

6.4.a. Annual State expenditure on forests and services they render

	1999-2002	2003-2007	2008-2012	2013	2014	Sources
<i>million euros 2014/year</i>						
Supervision of forest management						
...including application of forestry regulations	n.a.	165.0	140.9	121.6	140.4	Maaf
...including aid for private forest management	n.a.	156.1	161.3	115.6	80.1	Maaf
...including incentive tax measures	n.a.	103.6	93.6	106.1	104.0	Maaf
Risk management						
Risk management for forests (and also directly and indirectly for Man)						
...including prevention of fires	37.0	32.6	28.5	25.0	20.9	Maaf
...including firefighting	98.2	154.0	106.5	101.5	93.8	MI
...including restoration of forest cover after storms and recycling of storm-affected timber	n.a.	n.a.	60.1	46.4	31.8	Maaf
...including expenditure for forest health	n.a.	84.8	80.8	46.4	31.8	Maaf
Management of risks by forests installed by Man						
...including restoration of mountain lands	13.3	17.9	18.1	17.4	17.5	Maaf
...including fixing of coastal dunes	0.8	1.1	1.0	1.8	2.5	Maaf
Protection of the forest biodiversity						
...including actions for threatened species	n.a.	n.a.	n.a.	0.3	0.3	Medde
...including biological reserves (creation, monitoring, etc.)	0.1	0.3	0.7	2.1	2.0	Medde
...including Natura 2000 contracts	0.0	0.2	0.7	1.0	0.0	Medde
Knowledge of the forest ecosystem						
...including Arboretum des Barres	n.a.	n.a.	n.a.	0.3	0.3	Maaf
...including management of the Renecofor network	n.a.	n.a.	n.a.	0.2	0.2	Medde
	0.2	0.2	0.2	0.2	0.2	Maaf

Sources: (see column "Sources") Ministry of Agriculture, Agrifood and Forestry (Maaf), Ministry of Ecology, Sustainable Development and Energy (Medde), Ministry of the Interior (MI).

Clarifications:

- Supervision of the forest management, including application of the forestry regulations: compensatory payment.

- Risk management:

- including prevention of fires: ONF Gim – annual convention data + APR data in PC for regional delegations.

- including restoration of forest cover after storms and recycling of storm-affected timber: APR data in PC for Klaus.

- including restoration of mountain lands: ONF Gim – annual convention data + APR data in PC for regional delegations + Medde risks Gim convention.

- including fixing of coastal dunes: ONF Gim – annual convention data.

- Knowledge of the forest ecosystem:

- including Arboretum des Barres: ONF Gim – annual convention data.

- including management of the Renecofor network: annual study and research conventions.

Gim: general interest mission.

APR: annual performance report.

PC: payment credits.

n.a.: data not available

■ Analysis

The main State expenditure to maintain the services rendered by the metropolitan forests stem from public service missions including the supervision of sustainable management, risk management for the forests (including the reconstitution of forest stands following recent storms and Klaus in 2009) or by the forests (restoration of mountain lands and fixing of coastal dunes), protection of the biodiversity and knowledge of the ecosystem.

Supervision of forest management

Expenditure incurred to implement the forestry regulations in public forests has been globally stable since 2005 and is close to 140 million euros. Downward fluctuations in 2012 and 2013 stem from a temporary change in situation in terms of the value added tax (VAT).

Forest management aid expenses in private forests correspond mainly to investments into forest stands and further downstream, to expenses in organization, forest access and operation of the *National Forest Property Center* (CNPF) and the *Technological Institute of Forestry, Cellulose and Wood Construction* (FCBA).

Tax incentives for sustainable private forest management remained stable during the 2000s and then increased during the first half of the 2010s, due mainly to changes in the solidarity tax on wealth (ISF) which increased the impact of the partial forest waiver regarding this tax.

This tax expenditure consist mainly of partial waivers of ISF and free transfer rights, whereby forest owners commit to managing their forests sustainably for thirty years. To a lesser extent, this expenditure also includes tax reductions and credits for certain forest investments under the forest investment tax incentive scheme (DEFI-forêt).

Firefighting

The *Ministry of the Interior's* expenditure for firefighting is divided between airborne resources, military civil security resources and subsidies (including support groups). The heavy airborne equipment (Trackers, Canadairs, Dash) has remained stable over the last two decades but the costs have increased with the more efficient equipment. Over the same period, the staff and the availability of civil security intervention units decreased slightly, but staff training and equipment improved, so their capacity generally remained stable. However, their cost increased sharply. Firefighting costs can vary from one year to the next depending on the extent of interventions which can especially influence the aircraft deployment conditions and potential acquisitions of air tankers to replace decommissioned aircraft.

Forest fire prevention

Expenditure of the Forestry Ministry covers forest workers specializing in forest fire protection structures (DFCI), monitoring and fire outbreak patrols and subsidies for investment and DFCI activities.

Fire prevention expenditure has been dropping since 2010, as some expenses are paid by the departments (forest firefighters), the gradual acquisition of sufficient equipment for the southern half of the country and the lack of major fires (favorable climate conditions, success of the incipient fire extinguishing policy).

Restoration of the forest cover after storms

The expenditure for restoring the forest cover has increased substantially since 2010 following Cyclone Klaus in January 2009. The 2010 and 2011 payments relate mainly to the cleaning and the 2013 and 2014 payments to the reconstitution itself.

Restoration of mountain lands

Mountain land forestry restoration and coastal dune protection operations are provided by the *National Forest Office* on behalf of the *Ministry of Agriculture, Agrifood and Forestry* (Maaf) and relates to:

- advice protection work: torrent correction, drainage of waterlogged and therefore unstable soils, biological engineering work,
- close protection to supplement active protection: restraint or deviation of material flows.

Mountain land restoration expenditure remains stable overall and fluctuates between 15 and 20 million euros a year over the last decade. Expenditure increased in 2012 due to exceptional climate events. Heavy winter snowfall in 2013 caused major spring floods in the South-West.

Dune fixing

The *National Forest Office* maintains and fixes dunes on the edge of State-owned forests by plantings (arenaceous plants), windbreaks, safety fences and footpaths. Most of these operations involve dunes on the Atlantic coast. They aim to protect the dunes from erosion and protect or improve their biodiversity, provide public access without disturbing natural balances and renew forest stands.

Expenditure on dune fixing has increased radically since 2011 due to the costs of reconstituting dunes following Cyclone Xynthia in 2010 and strong winter storms close together in 2014 which prevented the renewal of the dune mattress.

Protection of the biodiversity

The aim of the Natura 2000 network is to contribute to preserving the unusual biodiversity throughout Europe. It consists of sites designated by member States. In France, the Natura 2000 network currently covers over 6.9 million land hectares, i.e. 12.6% of the country. Management measures outlined in documents of objectives drawn up for each site, which aim to maintain or restore the state of conservation of habitats and species of community interest, can be implemented through Natura 2000 contracts, voluntary commitments between area owners or managers and the State, and benefit from public financing (State and European Union).

The first Natura 2000 contracts for forest environments were signed in 2003. The initiatives implemented most relate to projects that promote the development of senescent woodlands, the creation or rehabilitation of clearings or heathlands and unwanted species control operations (ASP, 2010). In the European programming period 2007-2013, over 430 forest contracts were signed, for an amount of about 7.8 million euros, mainly in the Provence-Alpes-Côte d'Azur, Franche-Comté and Rhône-Alpes regions.

Maaf further finances nearly 2 million euros for managing State nurseries and seed orchards to conserve and improve the diversity of genetic forest resources.

Knowledge of the forest ecosystem and state of health of stands

Expenditure on the Renecofor network is stable and financed jointly by Maaf and the Ministry of Ecology, Sustainable Development and Energy (Medde). State expenditure on the state of health of stands corresponds to the operating costs of the forest health monitoring system managed by the Forest Health Department, mainly subsidies paid to the *National Forest Ownership Center* (CNPF) and the *National Forest Office* (ONF) for their involvement in the correspondent-observer network, to the *National Institute of Geographic and Forestry Information* (IGN) for its involvement in the monitoring, data collection and management and the research institutes for collaborating in the development of knowledge in this field. Fluctuations are mainly linked to the research program timetables and the general trend is towards significant growth in budgets set aside for this field.

Note also that the State subsidizes IGN under forest resource monitoring for the implementation of the forest inventory. This also contributes to the knowledge of the forest ecosystem, mainly via the acquisition of ecofloristic data.

■ Data sources and methodology

◆ Producer of data

Ministry of Agriculture, Agrifood and Forestry:

<<http://agriculture.gouv.fr/foret-et-industries-du-bois/foret-et-industries-du-bois>>

Ministry of Ecology, Sustainable Development and Energy:

<<http://www.developpement-durable.gouv.fr/-Eau-et-Biodiversite,5772-.html>>

Ministry of Interior:

<<http://www.interieur.gouv.fr/Le-ministere/Securite-civile>>

◆ Methodology

Expenditure amounts are expressed in million euros and correspond to payment credits.

The Maaf data relate to:

- for the implementation of the forestry regulations: the ONF compensatory payment;
- for the tax incentives: the tax expenditure retraced in the document "Presentation of tax credits and expenses" included every year in the annual performance report on the program 149 Forest of the State budget. These include DEFI-Forêt measures, the increase in decreasing depreciation for certain primary processing corporate equipment, partial ISF waiver, partial waiver of free transfer rights, reduce rate for silviculture and logging and exoneration from land tax on non-constructed holdings;
- for the DFCI prevention expenditure: the payment credits for the regional delegations as stated in the annual performance report and the annual expenditure agreed for the ONF DFCI general interest mission.
- for the reconstitution expenditure after Cyclone Klaus (including cleaning and reconstitution): the payment credits indicated in the annual performance report;
- for expenditure for restoring mountain land: the payment credits indicated in the annual performance report for the regional delegations, the annual expenditure agreed for the general interest mission and the "natural risks" general interest mission annual convention run by Medde;
- for the dune fixing expenditure: the annual expenditure agreed for the ONF "dunes" general interest mission;
- for the management expenses of the Renecofor network: the annual study and research conventions with ONF;
- for the arboretum expenses: the annual conventions with ONF;
- for the expenses linked to the knowledge of the state of health of stands: the subsidies to ONF (forest health general interest mission) and CNPF for their involvement in the forest damage systematic monitoring network (16 x 16 grid) (having deducted European subsidies up to 2006) and IGN for the databases (development of applications, hosting of bases, maintenance, promotion) and the subsidies to research for studies in the forest health field. The interregional operating budgets are not taken into account. The amounts indicate relate to the commitment authorizations.

The following are not included:

- Medde expenses (currently estimated at 1 to 2 million euros per year) for fire prevention, basically to produce forest fire natural risk prevention plans (PPR). The proportion of these plans in all PPR is not available.
- European financing from the *European Agricultural Fund for Rural Development* (EAFRD) mobilized under the implementation of rural development plans and Natura 2000. This financing is however substantial. As a guide, the share allocated to the forest of costs in preparing and organizing objective documents has been estimated roughly by Medde – pro rata to the forest area in the Natura 2000 sites – at 7.3 million euros in 2010 (a more or less stable amount in recent years).

The Ministry of Interior's data do not include the expenses for departmental fire and emergency services (SDIS) for fighting forest fires, where precise figures would require analytical accounting common to the SDIS and supplementary expert assessments. They have been estimated at 231 million euros (Chatry *et al.*, 2010).

Expenditure linked to the biological reserves relates to the Medde financing from 2002 of biological reserves in public forests (under the State-ONF contract).

◆ Bibliography

Annual performance reports (2011, 2012, 2013, 2014):

<<http://www.performance-publique.budget.gouv.fr/documents-budgetaires/lois-projets-lois-documents-annexes-annee/exercice-2014/projet-loi-reglement-rap-2014-mission-agriculture-alimentation-foret-affaires-rurales>>

<<http://www.performance-publique.budget.gouv.fr/documents-budgetaires/lois-projets-lois-documents-annexes-annee/exercice-2013/projet-loi-reglement-rap-2013-mission-agriculture-alimentation-foret-affaires-rurales>>

<<http://www.performance-publique.budget.gouv.fr/documents-budgetaires/lois-projets-lois-documents-annexes-annee/exercice-2012/lr-rap-2012-mission-agriculture-peche-alimentation-foret-affaires-rurales>>

<http://www.performance-publique.budget.gouv.fr/sites/performance_publique/files/farandole/ressources/2011/rap/pdf/DRGNORMALMSNAC.pdf>

Chatry C., Le Gallou J.-Y., Le Quentrec M., Lafitte J.-J., Laurens D., Creuchet B., 2010. *Climate change and extension of areas sensitive to forest fires*, report no. 1796 of the General Council of Food, Agriculture and Rural Areas, Maap, MIOMCT, MEEDDM, Paris, 90 p + appendices.

Authors: Étienne Chapelant, Jean-Luc Flot, Philippe Joannelle, Denys Rocher (Maaf) and Jean-Pierre Cabaret (Medde)

6.5. Jobs in the forest-timber sector

6.5.a. Number of salaried and independent jobs in the forest-timber sector, per professional branch

6.5.a.1. Changes in total employment per activity branch

BOX 7: Employment in the timber sector: potentially more than 800,000 employees overall

Purpose of the indicator

The indicator details the number of jobs and the proportion of salaried and independent employment (**6.5.a**) for each professional branch in the sector: silviculture and logging, woodworking and manufacture of wooden items, paper and paperboard industry and manufacture of furniture (wood and non-wood).

Employment in the sector makes a major contribution to rural economies and the living environment in rural areas. The number of jobs indicates the role of forest-timber-paper-furniture professional branches in the formation of revenues and national employment generally, which are major sources of social well-being. In addition, a “sufficient” and suitably-qualified number of workers is a prerequisite not just for forest management and timber productions but also to ensure the social and ecological functions of forests.

However, some forest- and timber-related jobs are not counted in this indicator (construction, timber processing equipment, etc.) and Box 7 estimates that there are more timber-related jobs based on a broader analysis of the timber sector. Other forest- and timber-related jobs are not counted here, for example: forest- or timber-related jobs within less specialized businesses or bodies (nature leisure activities, construction, teaching and research, etc.).

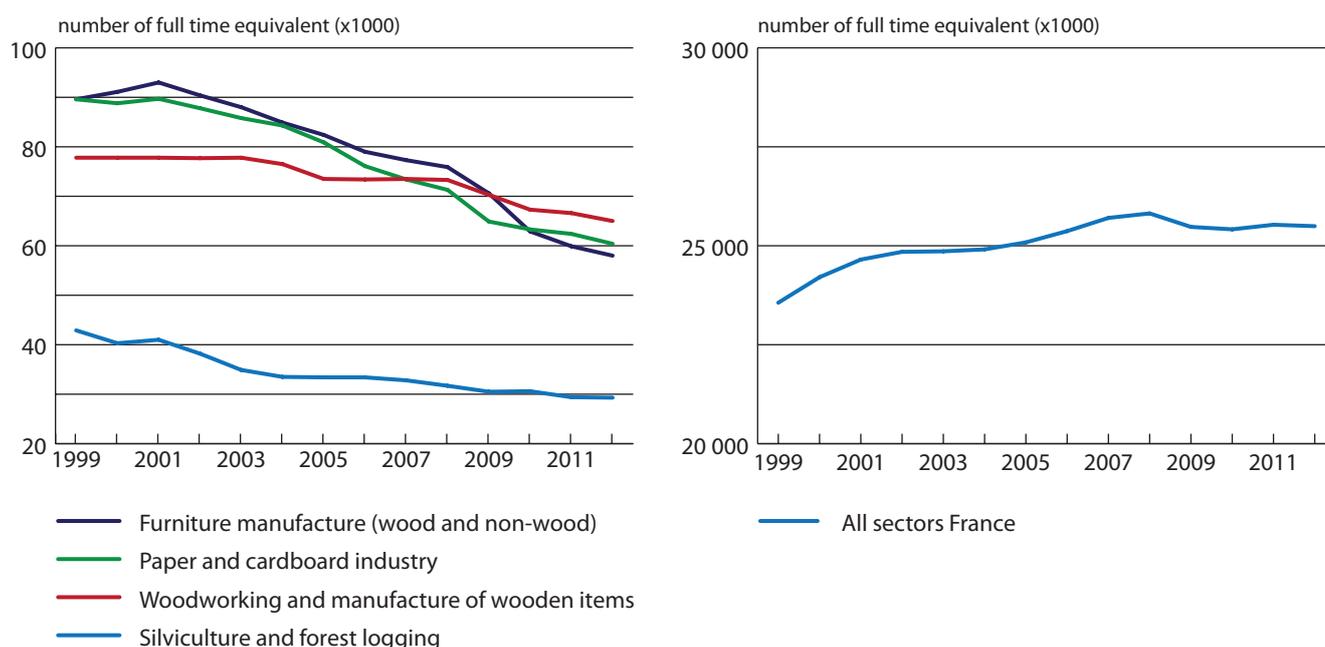
Results

◆ 6.5.a. Number of salaried and independent jobs in the forest-timber sector, per professional branch

		1999-2002	2002-2007	2008-2012
		Number (x 1000) and % independent		
Silviculture and logging	Total FTE employment	40.6	34.4	30.3
	... including FTE salaried job	31.4	25.9	22.8
	... including independent job	9.2	8.5	7.5
	% independent	22.6	24.7	24.7
Woodworking and manufacture of wooden items	Total FTE employment	77.8	75.4	68.5
	... including FTE salaried job	72.2	69.8	62.9
	... including independent job	5.6	5.6	5.7
	% independent	7.2	7.4	8.3
Paper and paperboard industry	Total FTE employment	89.0	81.4	64.5
	... including FTE salaried job	88.6	81.0	64.0
	... including independent job	0.4	0.4	0.4
	% independent	0.5	0.5	0.6
Manufacture of furniture (wood and non-wood)	Total FTE employment	91.0	83.7	65.5
	... including FTE salaried job	77.2	70.2	52.4
	... including independent job	13.8	13.5	13.1
	% independent	15.2	16.1	20.0
All sector branches	Total FTE employment	298.4	274.8	228.7
	... including FTE salaried job	269.4	246.9	202.1
	... including independent job	29.0	27.9	26.6
	% independent	9.7	10.2	11.6
France, all sectors	Total FTE employment	24,316	25,129	25,547
	... including FTE salaried job	21,745	22,541	22,827
	... including independent job	2,571	2,588	2,720
	% independent	10.6	10.3	10.6

Source: National Institute of Statistics and Economic Studies (Insee) via the Forest Economy Laboratory (Lef)

◆ 6.5.a.1. Changes in total employment per activity branch



Source: National Institute of Statistics and Economic Studies (Insee) via the Forest Economy Laboratory (Lef)

■ Analysis

In France, in 2012, employment in the forest-timber-paper-furniture sector account for slightly more than 200,000 full time equivalent (FTE) jobs, including almost 30,000 in the silviculture sector and logging, i.e. 0.8% and 0.1% respectively of the total employment in France (6.5.a). By way of comparison, the “agriculture” branch – cultivation and animal production, hunting and ancillary services – alone accounts for 790,000 FTE jobs (i.e. 3% of total employment in France) in 2012. A fairly marked drop in employment is noted over the period in all branches. This commenced well before the 2008 crisis, even as global employment in France was rising (6.5.a.1). Lastly, the proportion of independent workers, which is relative stable in the total employment in France (around 11%), is rising in all branches of the forest-timber-paper-furniture sector, reflecting a reduction in large corporate structures.

In 2012, the weight of the “woodworking and manufacture of wooden items”, “paper and paperboard industry” and “furniture manufacture” branches in employment in the sector is more or less equivalent (around 30% of FTE jobs in each sector), whereas the “silviculture and logging” sector accounts for less than 15%.

There are slightly more independent workers in the forest-timber-paper-furniture sector than the national average: 12.4% against 10.9%. But the situation is very different between the branches: nearly one job in four in silviculture and logging and furniture manufacture is independent, whereas woodworking and the paper-paperboard industry are more concentrated (8.8% and 0.7% of independents respectively).

A comparison of national employment statistics in terms of number of people and number of FTE people shows that there are far fewer part-time workers in the forest-timber-paper-furniture sector than in the entire national economy. The woodworking and manufacture of wooden items branch has the highest part-time rate.

Employment in France in the forest-timber-paper sector (excluding furniture) accounts for 6% of the same sector in the *European Union* of 27 (State of Europe’s Forest, 2011).

The intervention level of the forest workforce can be measured by the amount of labor from silviculture and logging for 1000 hectares of forest. There are fewer than two workers on average for 1000 ha in France against about three in Europe (including Russian Federation), which reflects more extensive forest management in France than on average in Europe.

Employment (in FTE) in the forest-timber-paper-furniture sector in France has been declining steadily over the period 1999-2012 (-29%), whereas total employment in France is increasing (+8%). Thus, the proportion of the forest-timber-paper-furniture sector in the total French employment has dropped from 1.3% in 1999 to 0.8% in 2012 (6.5.a).

All branches of activity in the forest-timber-paper-furniture sector are showing a downward trend (6.5.a.1). The furniture manufacture and paper and paperboard industry branches have lost the most jobs between 1999 and 2012 (32,000 and 29,000 respectively), i.e. more than 305, whereas there is a more modest drop in the woodworking branch (13,000 jobs, i.e. -17%).

In terms of job losses, the forest-timber-paper-furniture sector was more affected than the French economy as a whole by the 2008 crisis: the variation rate of the employment indicator between 2008 and 2009 is -6.3% against -1.3% for all activity sectors together. The paper and paperboard industry lost the most jobs due to the crisis (-9% between 2008 and 2009), followed by furniture manufacturing which dropped 7% between 2008 and 2009 and 11% between 2009 and 2010. The decline continued in all branches in 2012, but seems to have picked up its pre-crisis rhythm.

The employment structure per branch in the forest-timber-paper-furniture sector changes slightly in the period 1999-2012: the logging and silviculture proportion remains stable (14% of total employment in the sector), whereas the proportion of the woodworking branch increases from 26% in 1999 to 31% in 2012. The relative proportion of paper and furniture branches is reduced, from 30 to 285 for the paper and paperboard industry and 30 to 27% for the manufacture of furniture.

The proportion of independent workers in the forest-timber-paper-furniture sector, is higher than the national average in 2012, unlike in 1999 when it was lower. It is showing an upward trend in all branches and remains highest in silviculture and logging. The furniture branch has seen the greatest increase in its proportion of independent workers (+7.1 points over the period).

The downward trend of employment in the sector seems prevalent throughout Europe (State of Europe’s Forest, 2011).

By cross-referencing the information from Indicators 6.2 on the added value and 6.5 on employment in the sector, an added value per job can be calculated which characterizes the apparent productivity of the work in value. It varies little between 1999 and 2012, moving on average from €57k₂₀₁₄ in 1999 to €55k₂₀₁₄ in 2012; it is greater and stable (€72k) in silviculture and logging, at a similar level but decreasing in the paper-making branch (where it drops from €72 to €67k), lower and still decreasing in furniture (€42 to €40k) and in an intermediate position in woodworking, where it remains less than the average but with a slight increase (€48 to €49k). A particular feature of this final branch is also better resistance to the drop in labor (-1.4% per year) than the other three branches (-3.1%/year). In conclusion, mechanical woodworking is a branch which is increasing its apparent productivity of the work and withstands the erosion of its workforce better than the others.

The demographic characteristics of the workforce are also essential for the vitality and sustainable development of an activity sector. *Eurostat* supplements the indications in the table with results that can usefully be summarized here:

- According to data from the European Union Labour Force Survey (EU LFS) conducted by *Eurostat*, 39% of silviculture and logging employees in France in 2010 were over 50 years old (constantly-increasing percentage since the 1990s) when the European average is about 25% (State of Europe's Forests, 2011). In the paper and paperboard industry, 22% of workers are over 50.
- The proportion of women in forest and timber trades is also lower than the European average: 19% in France for 2010 for silviculture and logging and 23% for the paper and paperboard industry when the European averages are 25% and 30% respectively. The trend seems fairly stable (Source: European Union Labour Force Survey (EU LFS) – *Eurostat*). However, the “qualitative” data on the type of employment held by women are not available.
- The education level of workers in the forest-timber-paper sector (excluding furniture) appears to be increasing. For silviculture and logging, the breakdown per education level under the categories “lower secondary education or less, ISCED1997 levels 0, 1 and 2”, “upper secondary education, ISCED1997, levels 3 and 4”, “tertiary education, ISCED1997, levels 5 and 6” changed from 45%, 45% and 11% in 2000 to 31%, 45% and 25% in 2010. The breakdown in 2000 for the woodworking branch was 47%, 44% and 9% against 39%, 50% and 11% in 2010. The same trend is seen in the paper and paperboard industry: 35%, 49% and 16% in 2000 against 22%, 55% and 23% in 2010 (Source: European Union Labour Force Survey (EU LFS) – *Eurostat*).

Forest- and timber-related jobs are under-estimated in this indicator. Firstly, the work by owners themselves in their forests is difficult to quantify and is not counted in the Insee national accounting data. In 1999, in the survey on the structure of private forest ownership, the Statistics Department of the Ministry of Agriculture estimated this work at eleven million days per year, i.e. 49,000 FTE (more than the employment counted in the national statistics for silviculture and logging). Secondly, the activity nomenclature and publication of the Insee data cannot isolate and list many forest- or timber-related jobs both upstream and downstream in the sector. Thus, forest- and timber-related jobs within less specialized businesses or bodies are only partially taken into account in Indicator 6.5, if at all.

- administration or public establishments (ministries, regional administrative divisions, *National Institute of Geographic and Forestry Information* (IGN), etc.)
- education, training and research (technical or higher education, applied research bodies and technical institutes, permanent training, etc.)
- “non-wood” productions: hunting, gathering (mushrooms, plants, seeds, etc.), tourism, etc.
- manufacture of machinery and equipment,
- transport of timber and products after initial processing,
- construction, energy,
- trade and trading,
- product chemistry,
- etc.

Specific studies would be necessary to determine numbers employed in the forest-timber sector and all related activities more exhaustively.

Box 7 presents the employment data calculated by the SSP (Maaf, 2013), which for the 2010s are added to the chain of sectors which can be partially or potentially attached to the timber sector. Thus, the core sector represented 222,000 employees in 2010, to which are added 254,000 and 379,000 employees in the partial and potential forest sectors.

BOX 7: Employment in the timber sector: potentially more than 800,000 employees overall

The analysis conducted for the publication GraphAgriBois 2013 considers a broad scope for the sector: from the tree to the timber product. The timber sector is analyzed using a tool developed by Insee in partnership with the SSP. It is based selecting establishments from their activity (NAF code). The annual production surveys (EAP) and the annual branch survey by the SSP of logging companies and sawmills provide this tool with extra information. All these establishments form the scope of the sector. The data are understood to be workforce not FTE and only relate to employees.

Three levels in the activity code appendix to the GraphAgriBois publication detail the adherence of the sector: the core sector, activities that are fully integrated in it, the partial sectors which have a significant proportion of their activity integrated in it and the potential sectors, where a (very) restricted number of establishments are in the sector. It has been possible to include certain establishments with a partial or potential activity in the core or exclude them from the sector using the responses to the surveys mentioned above.

These data, although taken from an Insee primary source, cannot be compared with those presented in Indicator 6.5: they are shown as workforce numbers, not as FTE, and only relate to employees in a different sector scope from the one adopted in Indicator 6.5. The detailed methodology of data is presented in the original publication (Maaf, 2013).

The core sector includes silviculture, logging, sawing, woodworking or the paper and paperboard industry: the vast majority of the activity is devoted to the timber product.

In other activities like furniture manufacture, timber construction, trade and intrasector transport, the establishments may have only part of their activity linked to the timber sector. They then belong to the partial or potential scope of the sector.

Thus, at the end of 2010, the core timber sector had 58,164 establishments including 39,000 non-employers. The core sector workforce was 222,173 employees. Sectors included partially amounted to 102,535 establishments for 253,924 employees. Lastly, 69,178 establishments counting 378,677 employees could potentially be involved but only (very) marginally in the sector.

Table B.7.1. Workforce in the scope of the national timber sector

	Scope of the timber sector					
	Core		Partial		Potential	
	Establishments	Employed workforce	Establishments	Employed workforce	Establishments	Employed workforce
Silviculture and logging	31,648	20,389	0	0	0	0
Logging equipment	0	0	873	18,553	0	0
Sawing and initial timber processing	4,056	26,432	0	0	0	0
Woodworking	7,648	44,565	0	0	0	0
Paper and paperboard industry	2,101	67,616	0	0	0	0
Furniture manufacture	2,431	26,888	13,373	14,026	0	0
Timber construction work	9,832	31,274	72,482	131,301	24,606	53,749
Miscellaneous wooden objects	32	65	23	107	1,839	4,025
Timber processing equipment	59	1,671	178	1,618	0	0
Intra-sector trade and transport	357	3,273	15,606	88,319	42,733	320,903
Total	58,164	222,173	102,535	253,924	69,178	378,677

Source: Maaf, 2013. GraphAgri Bois

<<http://agreste.agriculture.gouv.fr/publications/graphagri/article/graph-agri-bois>>

■ Data sources and methodology

◆ Producer of data

National Institute of Statistics and Economic Studies (Insee) – National accounts base 2010.
<http://www.insee.fr/fr/themes/theme.asp?theme=16&sous_theme=5.2.2>

◆ Methodology

The data used come from the national accounts base 2010 published by the National Institute of Statistics and Economic Studies (Insee). All the data used when the *sustainable management indicators* (SMI) 2015 were produced were public and available on the Internet (links as at 30 April 2015). They are:

- total in-house employment per branch in number of full time equivalent (thousands of people, “full time equivalent”) (88 items) – 1999-2012: series 6.209D

<http://www.insee.fr/fr/themes/comptes-nationaux/tableau.asp?sous_theme=5.2.2&xml=t_6209>

As defined by Insee, in-house employment, measured in number of people, covers all natural persons, whether or not resident, with a job in a resident production unit. It includes non-residents and seasonal workers working in the economic territory and excludes residents working outside it. The number of jobs is an annual average. All types of job are counted, including casual jobs. In-house employment is calculated here in “full time equivalent” and the total employment includes salaried and non-salaried employment.

The publicly-available data are used to calculate this indicator over the period 1999-2012. The activity branches adopted to qualify the “timber sector” or forest-timber-paper-furniture sector are the same as for Indicator 6.2. The changes between this and the previous SMI publications are also the same as for Indicator 6.2. The Indicator 6.5 data published in the 2015 version of the SMI cannot therefore be compared with the data of this same indicator published in the previous SMI versions. As all the variables for all the years used in calculating this indicator have been recalculated by Insee on base 2010, the series presented in totally uniform.

The national accounts data cannot be used to ascertain the breakdown of jobs per gender, age and education. Failing that, the Labour Force Survey (LFS) of the *Statistical Office of the European Commission* (Eurostat), or employment survey, implemented in France by Insee, gives an indication of these characteristics. However, it is important to bear in mind that the sample in the timber sector is too small to be representative and therefore the results of this survey are inaccurate.

◆ Bibliography

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Forest Europe, Unece, FAO, 2011. *State of Europe's Forests 2011, Status and Trends in Sustainable Forest Management in Europe, Forest Europe, Unece, FAO, Aas, Norway, 337 p.*

Maaf, 2013. GraphAgri Bois, Agreste, 2013 edition:

<<http://agreste.agriculture.gouv.fr/publications/graphagri/article/graph-agri-bois>>

Authors: Claire Montagné-Huck (Lef, Inra-AgroParisTech) and Daniel Desaulty (SSP, Maaf) for the box.

6.6. Occupational health and safety in the forestry sector

6.6.a. Number and rate of accidents at work and occupational illnesses

6.6.a.1. Change in accident rate, number of fatal accidents and occupational illnesses for employees (MSA data only)

Purpose of the indicator

This indicator presents the number of accidents at work, whether or not fatal, and the number of occupational illnesses occurring annually in forestry work (**6.6.a**). Workers signing up to the *Mutualité sociale agricole* (MSA) scheme or, in Alsace and Moselle, the *Caisse d'assurance accidents agricoles* (CAAA) scheme are the population monitored. It does not cover Civil Service forestry engineers and technicians.

Worker health and safety is an essential consideration in analyzing a sector. Forestry work is monitored especially due to the dangers of certain tasks. In this context, this is a fundamental indicator for measuring progress of the sector in terms of occupational health and safety.

Results

6.6.a. Number and rate of accidents at work and occupational illnesses

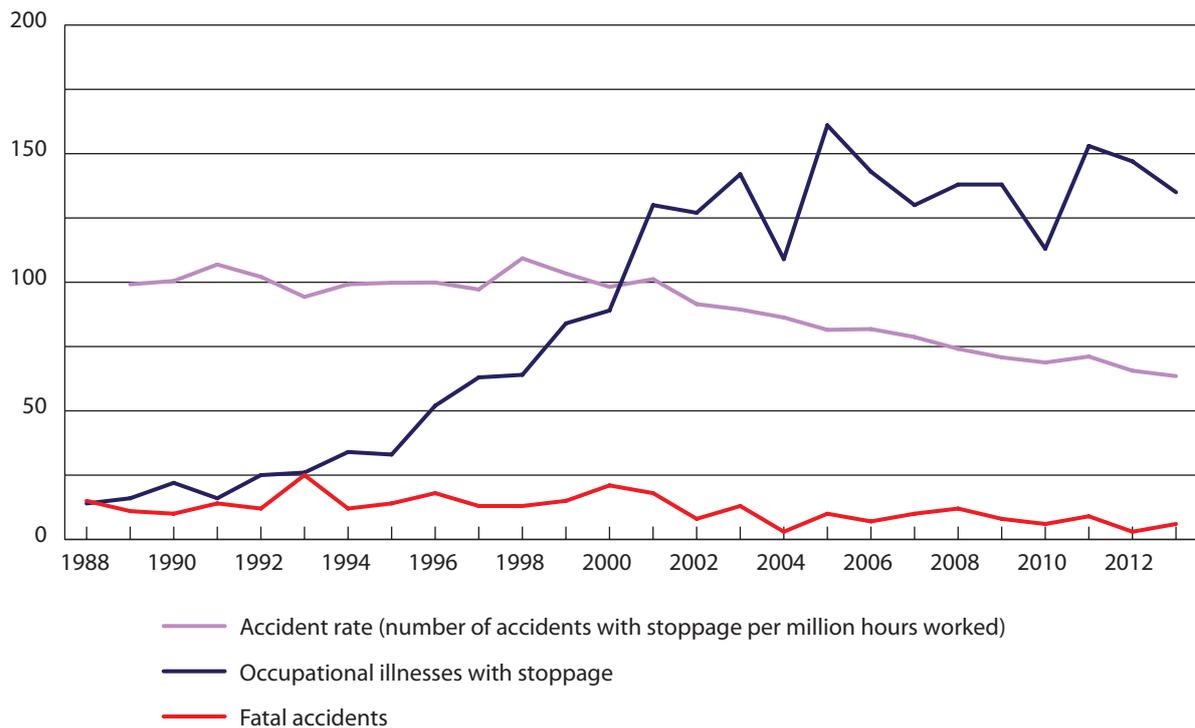
		1988-1992	1993-1997	1998-2002	2003-2007	2008-2012		2013		2014	
		MSA				MSA	CAAA	MSA	CAAA	MSA	CAAA
Fatal accidents	Employees	12	16	15	9	8	1	6	2	n.a.	0
	...including silviculture	1	2	1	1	0	0	0	0	n.a.	0
	...including timber logging specifically	8	11	11	6	5	1	5	1	n.a.	1
	...including fixed sawmills	4	3	3	2	2	0	1	1	n.a.	0
	...including office staff	0	0	0	0	0	0	0	0	n.a.	1
	Non-salaried	-	-	-	6	6	0	4	1	n.a.	0
	...including silviculture	-	-	-	0	0	0	0	0	n.a.	0
	...including timber logging specifically	-	-	-	5	5	0	4	1	n.a.	0
	...including fixed sawmills	-	-	-	0	0	0	0	0	n.a.	0
Accidents at work with stoppage	Employees	6,781	5,912	5,490	3,799	2,816	381	2,415	351	n.a.	339
	...including silviculture	1,087	1,102	974	729	624	63	592	73	n.a.	66
	...including timber logging specifically	2,514	2,394	2,172	1,364	983	236	801	194	n.a.	197
	...including fixed sawmills	3,158	2,403	2,343	1,706	1,209	78	1,020	77	n.a.	69
	...including office staff	22	12	1	0	0	4	2	7	n.a.	7
	Non-salaried	-	-	-	576	534	17	472	24	n.a.	16
	...including silviculture	-	-	-	35	26	1	20	2	n.a.	1
	...including timber logging specifically	-	-	-	520	493	16	430	21	n.a.	13
	...including fixed sawmills	-	-	-	21	15	0	22	1	n.a.	2
Number of hours of work (millions)	Employees	68	60	54	45	40	0	38	0	n.a.	0
	...including silviculture	12	11	10	8	8	0	8	0	n.a.	0
	...including timber logging specifically	20	18	16	13	12	0	11	0	n.a.	0
	...including fixed sawmills	33	28	25	21	18	0	16	0	n.a.	0
	...including office staff	3	3	3	3	3	0	3	0	n.a.	0
	Non-salaried	-	-	-	-	-	0	-	0	-	0
Rate (number of accidents with stoppage per millions of hours worked)	Employees	100	98	101	84	70	0	64	0	n.a.	0
	...including silviculture	92	98	99	86	78	0	75	0	n.a.	0
	...including timber logging specifically	126	137	136	103	85	0	72	0	n.a.	0
	...including fixed sawmills	97	85	92	82	68	0	63	0	n.a.	0
	...including office staff	7	4	0	0	0	0	1	0	n.a.	0
	Non-salaried	-	-	-	-	-	0	-	0	-	0
Occupational illnesses with stoppage	Employees	19	42	99	137	138	22	135	14	n.a.	14
	Non-salaried	-	-	-	19	27	1	45	1	n.a.	1

Source: Mutualité Sociale Agricole (MSA) and Caisse d'assurance-accidents agricoles d'Alsace et de Moselle (CAAA)

Clarification: The CAAA data provided for the period 2008-2012 are average annual data over 2010-2012.

n.a. : data not available

◆ 6.6.a.1. Change in accident rate, number of fatal accidents and occupational illnesses for employees (MSA data only)



Source: MSA (only)

■ Analysis

Having dropped substantially in the 1980s, the frequency of accidents at work in the forestry sector remained globally stable until 2001. It has improved significantly since 2002 (6.6.a) and all branches are showing a downward trend. Although logging has traditionally been the most risky activity, clear progress has been made as the accident frequency per million hours worked in this activity is now at the same level as for silviculture.

There are several social protection systems side-by-side in the forestry sector in France: the *Mutualité sociale agricole* (MSA), the *Association des assureurs* (which has delegated the Réunion de sociétés d'assurances) and a special scheme (inherited from the 1801 Concordat) for Alsace and Moselle: the *caisses d'assurance-accidents agricoles* (CAAA) Since 2002, the MSA data group the MSA's own statistics and those of the insurer group.

MSA data

The following trends are apparent for employees:

- continuous drop in accidents at work with stoppage since the 2000s, both in number and in frequency;
- the changes are less linear for fatal accidents at work and no clear trend emerges. However, taking the averages of the last five years, the figures are dropping compared with the five previous years (2009-2013 versus 2004-2008);
- the year 2000 seems to be an exception given

the storms in December 1999 which meant logging a large volume very quickly in extremely difficult conditions;

- the increase in the number of occupational illnesses at the end of the 1990s is mainly due to joint disorders. These were recognized for the first time in 1993 and the time between exposure to the risk and diagnosing the illness is often fairly long. However, taking the averages of the last five years, the number of occupational illnesses remains stable compared with the five previous years (2009-2013 versus 2004-2008);

The following trends are apparent for non-salaried workers:

- the year 2003 is atypical given the upsurge of the accident at work occupational illness regime;
- continuous drop in accidents at work with stoppage;
- the number of fatal accidents at work remains

- stable in recent years;
- increase in the number of occupational illnesses on average in the last five years.

CAAA data

The caisses d'assurance-accidents agricoles (CAAA) in Alsace and Moselle have recorded a drop in the number of accidents at work in the last five years. Occupational illnesses, after a rise in declarations in the late 1990s, have proved relative stable in the last five years.

■ Data sources and methodology

◆ Producer of data

Mutuelle santé agricole – MSA – <<http://www.msa.fr>>

Caisse d'assurance-accidents agricoles – CAAA – <<https://www.3caa.fr>>

◆ Methodology

The accident frequency rate represents the number of accidents with work stoppage per million hours of work declared. There is no point in calculating this frequency rate for the occupational illnesses as the times between exposure to the risk and diagnosing the occupational illness can be fairly long.

MSA

The data come from:

- for the non-fatal accidents, statements of accidents at work specifically and occupational illnesses (ATMP) which resulted in an initial payment of benefits in the period in question, for the salaried and non-salaried population governed by the agricultural regulations in metropolitan France, excluding the departments of Bas-Rhin, Haut-Rhin and Moselle (these three departments enjoy a special social protection scheme for accidents at work and occupational illnesses);
- for fatal accidents, surveys within the “Professional risk prevention” and “Occupational health” departments of the MSA *caisses*.

Non-fatal accidents are qualified with stoppage:

- for salaried employees, as soon as daily indemnities are paid, in the knowledge that the daily indemnities are paid from the first day of stoppage;
- for non-salaried staff, as soon as there is payment of benefits associated with stoppage days or daily indemnities.

Data relating to the non-salaried staff are only available from 2003 onwards. The ATEXA scheme (ATMP of non-salaried staff) has been in operation since April 2002, but there seems no point in presenting a truncated year. In addition, 2003 should be considered with caution given the upsurge in the scheme.

CAAA

The data of three CAAA come from the identical sources as the MSA. These are ATMP declarations sent to the three CAAA. The same is true for the qualification of non-fatal accidents at work. The data are only available from 2010 onwards.

Authors: Nicolas Viarouge (MSA) and Pascal Jan (CAAA)

6.7. Wood consumption

6.7.a. Production and apparent consumption of roundwood, sawn timber and wood panels

6.7.b. Harvesting, apparent consumption of roundwood and population

6.7.c. Production and apparent consumption of sawn timber and wood panels

6.7.d. Production and apparent consumption of paper pulp, paper and paperboard

Purpose of the indicator

The indicator presents the production and apparent consumption (production + imports – exports) of roundwood and timber by-products. The following are considered:

- roundwood and all initial processing products (**6.7.a**),
- logging products only (**6.7.b**): roundwood, including timber intended for the manufacture of forest wood chips),
- wood products only from the initial processing of the timber (**6.7.c**: sawn timber, cask wood and railway ties, veneer and plywood, particle and fiber board),
- paper products only from the initial processing of the timber (**6.7.d**: pulp, paper and paperboard).

Schematically, the roundwood supplies the initial processing which in turn supplies the second processing stage (not presented here). But other flows which are not separated from the data supplied here are grafted onto this scheme: recycling of sawmill by-products, salvaging old papers (see Indicator 6.7.1).

An analysis of the production and apparent consumption of timber and by-products positions the timber in relation to the needs of the entire economy represented by changes in demographics and assesses the weight of foreign trade (by comparing production and consumption), which is itself the subject of another indicator (6.8). It means assessing theoretically and in hindsight the public policies which tend to promote increased use of this understated, renewable material.

Results

6.7.a. Production and apparent consumption of roundwood, sawn timber and wood panels

		1993-1997	1998-2002	2003-2007	2008-2012	2013	2014	1993-1997	1998-2002	2003-2007	2008-2012	2013	2014
Products	Unit	Total production						Total apparent consumption					
Roundwood	million m ³ /year	69.1	69.0	61.8	62.6	60.5	62.3	68.3	66.6	60.0	58.4	56.4	58.9
Sawn timber, cask wood and railway ties	million m ³ /year	9.7	10.3	10.0	8.7	8.1	7.9	10.8	12.2	12.6	11.2	9.6	9.3
Veneer and plywood	million m ³ /year	0.7	0.7	0.5	0.4	0.3	0.3	0.8	0.8	0.8	0.7	0.6	0.6
Particle board	million m ³ /year	2.9	3.8	4.5	4.2	4.1	4.0	2.5	3.1	3.3	3.3	2.9	2.8
Fiber board	million m ³ /year	0.5	0.9	1.3	1.1	1.1	1.0	0.3	0.7	0.8	1.4	1.0	0.9
Paper pulp	million tonnes/year	2.7	2.5	2.4	1.9	1.7	1.7	4.3	4.3	4.0	3.2	3.4	3.1
Paper and paperboard	million tonnes/year	8.5	9.6	10.1	8.7	8.0	8.2	9.8	11.0	11.0	9.7	8.8	8.8
Products	Unit	Production per inhabitant						Apparent consumption per inhabitant					
Roundwood	m ³ /1000 inhabitants/year	1,197	1,172	1,014	998	951	974	1,183	1,131	984	931	886	922
Sawn timber, cask wood and railway ties	m ³ /1000 inhabitants/year	168	175	164	138	128	124	187	207	206	178	150	146
Veneer and plywood	m ³ /1000 inhabitants/year	11	11	8	6	5	5	14	14	13	12	10	10
Particle board	m ³ /1000 inhabitants/year	49	64	74	67	64	62	44	53	55	52	46	43
Fiber board	m ³ /1000 inhabitants/year	9	16	22	17	17	16	4	11	12	22	16	14
Paper pulp	tonne/1000 inhabitants/year	47	43	40	30	27	26	75	73	66	51	53	49
Paper and paperboard	tonne/1000 inhabitants/year	146	164	165	138	126	128	170	187	180	155	138	138

Sources:

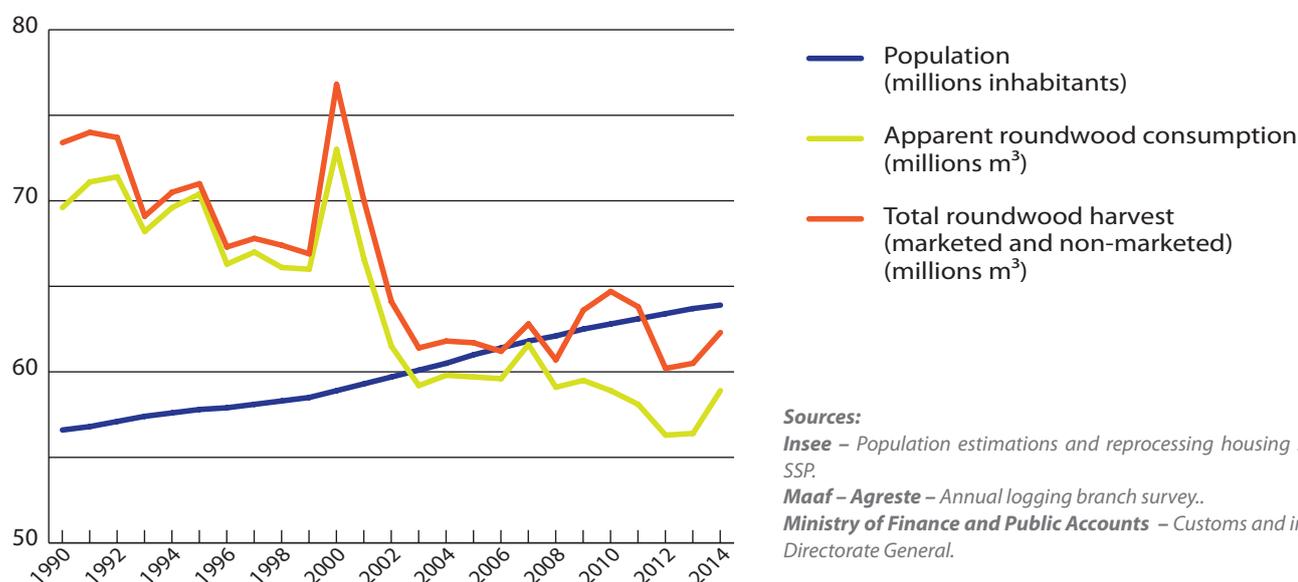
Insee – Population estimations and reprocessing housing survey SOeS/SSP.
Maaf – Agreste – Annual branch surveys, logging, sawing, planing and impregnation of the timber.

UFC: Plywood manufacturers union.

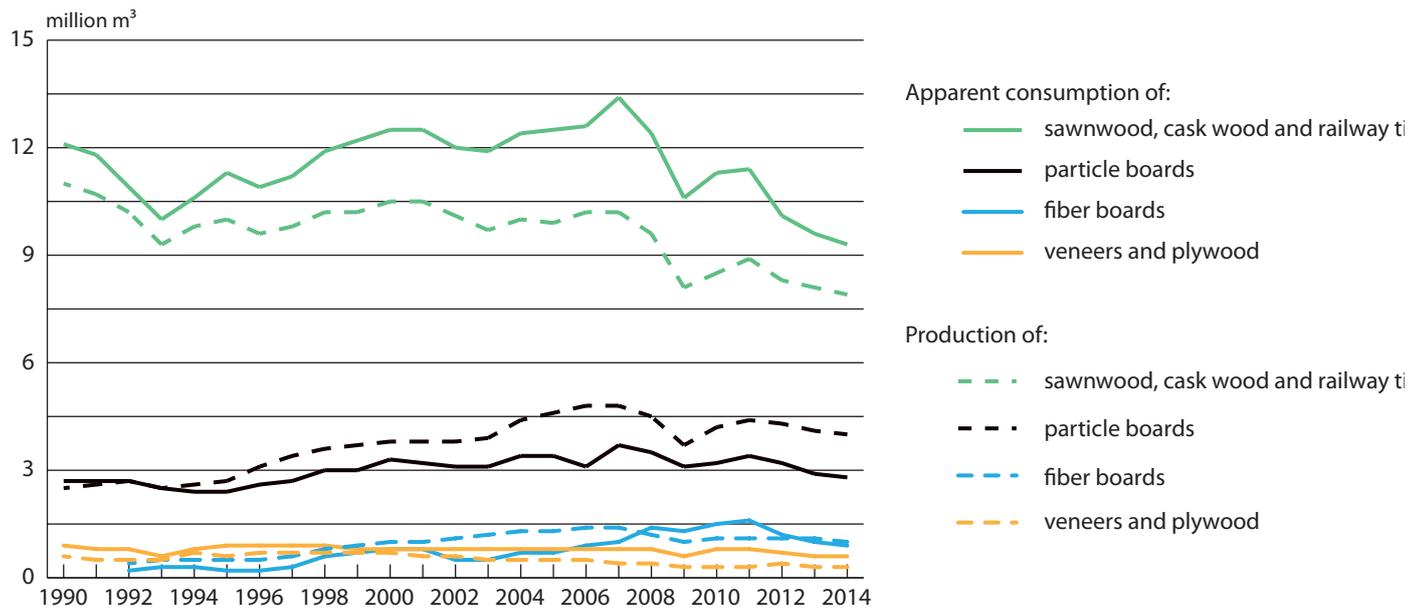
Copacel

UIPP: Process Panel Industry Union.

6.7.b. Harvesting, apparent consumption of roundwood and population



◆ 6.7.c. Production and apparent consumption of sawn timber and wood panels



Sources:

Maaf – Agreste – Annual branch surveys, logging, sawing, planing and impregnation of the timber.

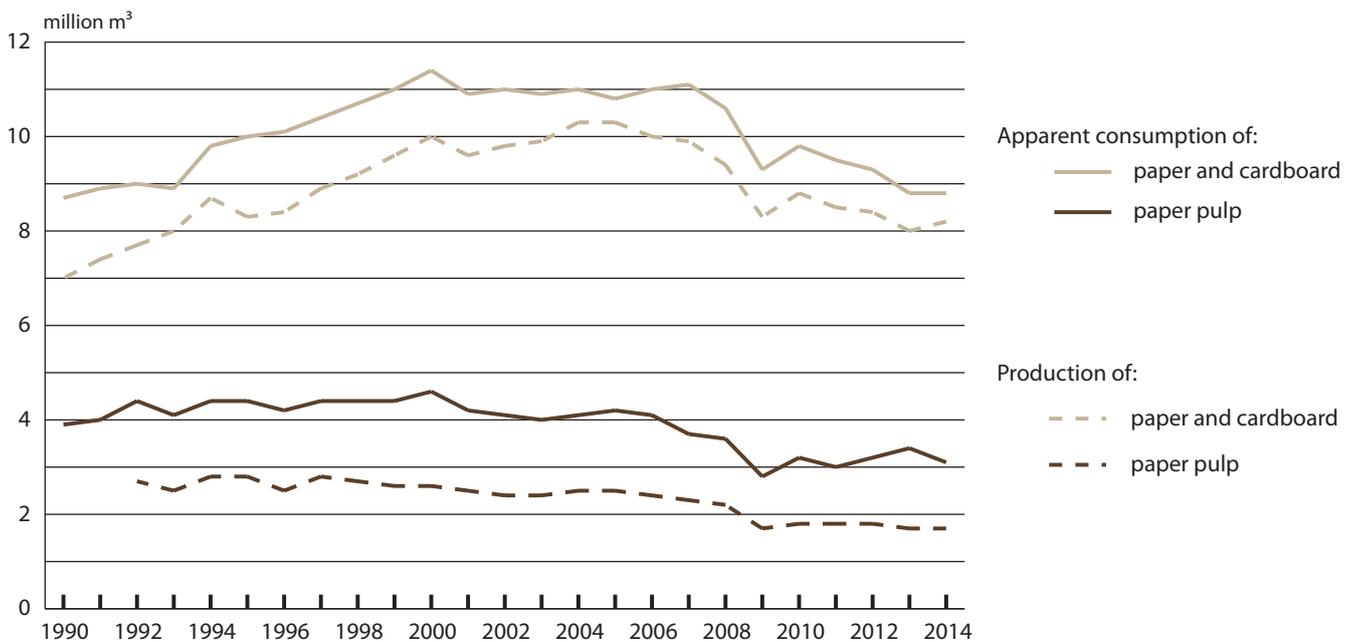
UFC: Plywood manufacturers union.

UIPP: Process Panel Industry Union.

EUROSTAT – JFSQ

Ministry of Finance and Public Accounts – Customs and indirect duties Directorate General.

◆ 6.7.d. Production and apparent consumption of paper pulp, paper and paperboard



Sources:

Copacel

EUROSTAT – JFSQ

Ministry of Finance and Public Accounts – Customs and indirect duties Directorate General.

■ Analysis

The apparent consumption of timber products in the period 1990-2013 is more than the national production except for roundwood and panels; it shows a downward trend for virtually all products.

The apparent consumption (sum of quantities produced and imported from which the quantities exported are deducted) changes in different ways depending on the type of product; comparing it with the national production demonstrates where France is self-sufficient, an exporter or rather an importer.

Table **6.7.a** "Production and apparent consumption of roundwood, sawn timber and wood panels" indicates the values in units per inhabitant. It can be seen that the apparent consumption of roundwood drops below the bar of 1 m³ per inhabitant.

Graph **6.7.b** "Timber harvest and population" shows the continuous increase in the population and the simultaneous decrease in the total harvest and apparent consumption. This drop in apparent consumption of wood is mainly the result of increasing exports of French raw material.

Graph **6.7.c** "Production and apparent consumption of sawn timber and wood panels" highlights the substantial drop in production and apparent consumption of sawn timber. The wood panel sector seems more stable with a upsurge in production in the early 2000s. The production of particle board is the only one to exceed consumption.

Graph **6.7.d** "Production and apparent consumption of paper pulp, paper and paperboard" highlights the reduction in consumption and production of paper pulp. The production and consumption of paper and paperboard has risen until the middle of the 2000s before starting to drop significantly. The production shortfall is recurrent for both these types of product.

Changes in timber consumption can be seen in graphs **6.7.c** and **6.7.d** and also reflects a change in products and behaviors: consumption of furniture manufacture from particle board rather than solid wood, use of digital technology meaning less use of paper.

Timber consumption in Europe (roundwood, sawn timber, panels, pulp and paper) increased strongly until the 2008 crisis which had a negative effect on the consumption of timber products and more general the forestry sector as a whole. Only the consumption of fuelwood seems to have withstood the crisis, mainly due to public policies encouraging renewable energies (Forest Europe, 2011).

■ Data sources and methodology

◆ Producer of data

Ministry of Agriculture, Agrifood and Forests, Statistics and Forecasting Department <<http://www.agreste.agriculture.gouv.fr>> heading "timber and by-products", sub-headings "timber harvest and sawn timber production" and "timber and by-products economic conditions".

Ministry of Finance and Public Accounts – <http://lekiosque.finances.gouv.fr/portail_default.asp>

EUROSTAT – <<http://ec.europa.eu/eurostat>>

◆ Methodology

- Results of annual branch surveys, logging, sawing, planing and impregnation of the timber. SSP – Maaf
- Professional production data:
 - UFC: Plywood manufacturers union
 - Copacel: French Union of paperboard, paper and cellulose.
 - UIPP: Process Panel Industry Union.
- Data from the Ministry of Finance and Public Accounts – Customs and indirect duties Directorate General.

◆ Bibliography

Forest Europe, Unece, FAO, 2011. *State of Europe's Forests 2011, Status and Trends in Sustainable Forest Management in Europe*, Forest Europe, Unece, FAO, Aas, Norway, 337 p.

6.7.1. Recycling and salvage

6.7.1.a. Recycling and salvage in the timber sector: paper, paperboard, sawmill by-products

6.7.1.b. Volume and destination of sawmill by-products

Purpose of the indicator

This indicator focuses on papers and paperboard for recycling (PCR) and sawmill by-products (quantity and destination for recycling) (6.7.1.a and 6.7.1.b). The “consumption of paper and paperboard for recycling” covers the paper and paperboard used as raw material by the factories in the sector in the paper and paperboard manufacturing cycle. The “use rate of paper and paperboard for recycling” is the consumption of paper and paperboard for recycling (PCR) divided by the production of paper and paperboard. It reflects changes in the proportion of reusing recycled fibers compared with all fiber resources used. The “salvage rate” is equal to the salvage of used paper divided by the consumption of paper and paperboard. It conveys the changes in the proportion of paper and paperboard consumed which has been salvaged after use and the development of a salvage system or the increase in its efficiency. The “apparent salvage” is equal to the PCR consumption to which is added PCR exports and from which PCR imports are deducted, modulo variation in stocks.

The sustainable management of the resource also involves the processing (recycling and salvage) of production waste and end-of-life products. The importance of recycling and salvage shows the ability of the sector to become part of a circular economy which improves the life cycle of products from their origin to their return to the natural environment.

Results

◆ 6.7.1.a. Recycling and salvage in the timber sector: paper, paperboard, sawmill by-products

		1988-1992	1993-1997*	1998-2002	2003-2007	2008-2012	2013	2014
Paper and paperboard for recycling	Consumption (million tonnes/year)	n.a.	4.3	5.5	5.9	5.2	5.1	5.4
	Use rate (%)	n.a.	48.8	56.6	59.0	60.5	64.0	65.9
	Apparent salvage (million tonnes/year)	n.a.	3.9	5.2	6.6	7.1	7.3	7.3
	Salvage rate (%)	n.a.	40.2	47.5	60.3	72.3	81.6	82.2
Sawmill by-products	Sawmill by-products (million tonnes/year)	6.0	6.8	7.9	8.3	8.3	8.3	8.2
	...including destined for crushing	3.6	3.9	4.4	4.5	3.8	3.2	2.9
	...including destined for energy	n.a.	n.a.	n.a.	n.a.	0.9	1.7	1.6
	Proportion destined for crushing (%)	59	57	55	54	46	38	36
	Proportion destined for energy production (%)	n.a.	n.a.	n.a.	n.a.	25	53	55

Sources:

Maaf, Statistics and Forecasting Department, Agreste, Annual branch survey, sawing, planing and impregnation of the timber (for the sawmill by-products). **COPACEL** (for the paper and paperboard for recycling).

Clarifications:

The consumption of paper and paperboard for recycling covers the paper and paperboard used as raw material by the factories in the paper and paperboard sector in the manufacturing cycle.

The use rate of paper and paperboard for recycling is the consumption of paper and paperboard for recycling (PCR) divided by the production of paper and paperboard. It reflects changes in the proportion of reusing recycled fibers compared with all fiber resources used.

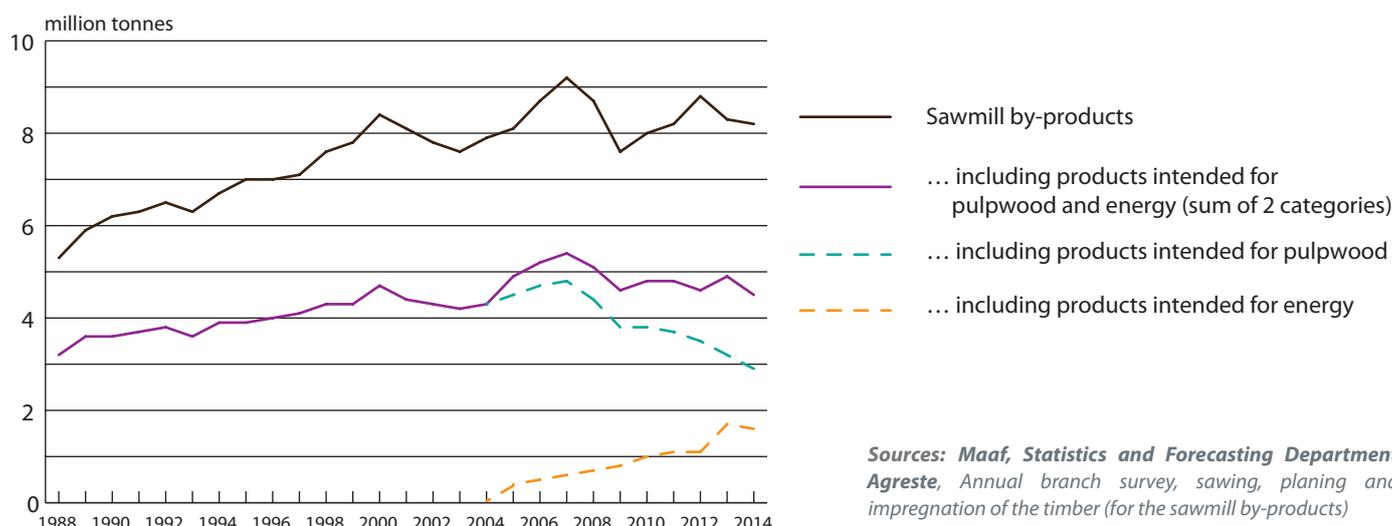
The salvage rate is equal to the salvage of used paper divided by the consumption of paper and paperboard. It conveys the changes in the proportion of paper and paperboard consumed which has been salvaged after use and the development of a salvage system or the increase in its efficiency.

The apparent salvage = PCR consumption + PCR exports = PCR imports + stock variations/

* For recycled paper and paperboard, average 1993-1997 produced from years 1995-1997 only/

n.a. : data not available

◆ 6.7.1.b. Volume and destination of sawmill by-products



Sources: Maaf, Statistics and Forecasting Department, Agreste, Annual branch survey, sawing, planing and impregnation of the timber (for the sawmill by-products)

■ Analysis

Sawmill by-products are increasingly important both economically and ecologically. They are no longer considered as waste but as raw material for crushing and energy generation industries and a large increase in quantities destined for this second application has been seen since the late 2000s. Since the end of the 1990s, the main raw material used in the paper industry is made up of paper and paperboard for recycling (PCR). The proportion is consolidating incessantly and virtually accounts for two-thirds.

Sawmill by-products (6.7.1.a and 6.7.1.b) are made up of bark, sawdust, shavings and miscellaneous offcuts from the sawing process. These volumes are declared in the annual branch survey "sawing, planing and impregnation of the timber". As the sawing output is around 50% on average (slightly more for conifers and broadleaved boules, slightly less for broadleaved square-edged sawing), about half of the volume of logs entering the sawmill are in the form of by-products. Their recycling is a not insignificant input for the company. They are used mainly for the direct production of energy, either within the sawmill, for example to supply the timber drying kilns, or after-sales to fuelwood suppliers. The crushing industries are a second outlet for these by-products; the offcuts, normally turned into wood chips, are purchased by manufacturers of paper pulp, fiber boards and particle boards. Bark is destined more for green spaces and gardens whereas sawdust and shavings can supply compressed wood fuel production units as pellets or briquettes or serve as animal bedding.

In 2013, energy production involved over half the 8.3 million tonnes of by-products generated by the sawmills and 38% supplied the crushing industries.

The increase in these products, which seems surprising in the light of the drop in production of sawn timber volume, can be explained by their improved use, from their status as infrequently-recycled waste to that of a sought-after raw material.

Paper and paperboard for recycling are collected from industrialists, households and shopkeepers, manufacturing offcuts and unsold items. They are used to produce paper and paperboard instead of virgin cellulose fibers extracted from the timber. Propelled by growing demand, mainly from the corrugated paperboard sector, the consumption of paper and paperboard for recycling settled at 5.4 Mt in 2014, an increase of 4.9% over the previous year. The use rate of paper and paperboard for recycling, which is confirming the increasing proportion of packaging (large consumer of paper and paperboard for recycling) in paper and paperboard production continued to grow in 2014, reaching 65.9%.

Paper and paperboard salvage has expanded considerably thanks for the development of selective collecting and the mobilization of the paper industry and all players in the recycling chain to promote collection, sorting and recycling. The apparent salvage is therefore increasing in 2014 (+1.1%) and is close to 7.3 Mt. France has a salvage rate of 82.2% (2014), above the European average, as in 2013, (71.7% in 2013) and is one of the most advanced European countries for salvage.

■ Data sources and methodology

◆ Producer of data

French Union of paperboard, paper and cellulose (Copacel) <<http://www.copacel.fr>>

Ministry of Agriculture, Agrifood and Forests – Statistics and Forecasting Department
<<http://www.agreste.agriculture.gouv.fr>>

◆ Methodology

Paper and paperboard consumption and recycling data come from Copacel surveys of French paper and paperboard producers. The import and export data come from the Directorate General of Customs. Results of the annual branch survey “sawing, planing and impregnation of the timber” from the SSP at Maaf.

◆ Bibliography

Agreste site <<http://www.agreste.agriculture.gouv.fr>> “timber and by-products” heading under “timber harvest and production of sawing” heading

Authors: Daniela Barrat (Copacel) and Guilhemine Astrié (Maaf – SSP)

6.8. Imports and exports

6.8.a. Import and export volumes in the forest-timber sector (million m³ EQ)

- 6.8.a.1. Structure in import and export volumes in the forest-timber sector in 2014
- 6.8.a.2. Volume of the 2000-2014 trade balance per branch
- 6.8.a.3. Volume of the trade balance of the forest-timber sector in volume
- 6.8.a.4. Comparison in volume of imports and exports in the forest-timber sector

6.8.b. Value of imports and exports in the forest-timber sector

- 6.8.b.1. Structure in value of imports and exports in the forest-timber sector in value in 2014
- 6.8.b.2. Value of the 2000-2014 trade balance per branch
- 6.8.b.3. Comparison in value of the forest-timber sector trade balance and the French trade balance
- 6.8.b.4. Comparison in value of imports and exports in the forest-timber sector

Warning: To analyze external trade, the sector is considered in its broadest acceptance consistent with the other economic indicators (6.2, 6.3 and 6.5 mainly).

Purpose of the indicator

The trade balance is the difference between the export volumes or values and the import of goods. The sector's trade balance is firstly presented in volume, converted into "cubic meters roundwood equivalent) for aggregation and comparison between the branches and detailed per branch (**6.8.a**, **6.8.a.1**, **6.8.a.2**, **6.8.a.3**, **6.8.a.4**) then in value, also detailed per branch (**6.8.b**, **6.8.b.1**, **6.8.b.2**, **6.8.b.3**, **6.8.b.4**).

The imports and exports are used to measure the economic performance of the forest-timber-paper-furniture sector in terms of international trade. A positive trade balance means that the country exports more goods than it imports. The terms "trade surplus" or "surplus balance" are then used. The term "trade deficit" is used for a negative balance.

Dynamic trade in timber and processed products is essential to sustainable forest development inasmuch as they fill the needs of individuals in France, Europe and worldwide. A trade surplus is normally held to create jobs whilst a trade deficit can lead to more competitive prices and lower inflation. The trade balance has a major impact on the gross domestic product, currency values, inflation and employment.

The indicator monitors changes in the trade balance deficit in the French forest-timber-paper-furniture sector in volume and value and compares the relative performance of different branches (including secondary processing products).

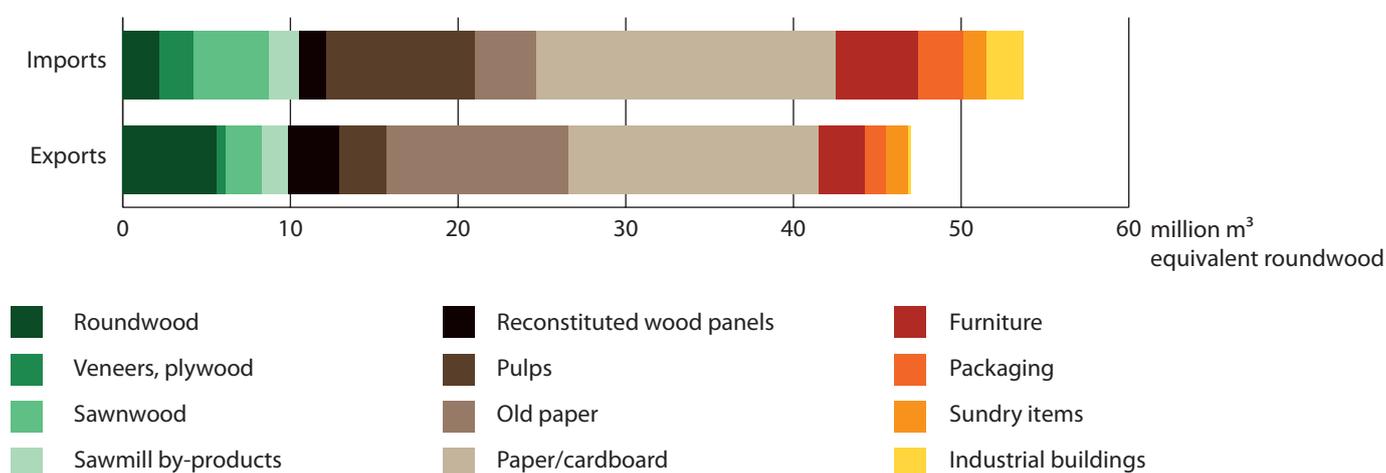
Results

6.8.a. Import and export volumes in the forest-timber sector (million m³ EQ)

	1990-1992	1993-1997	1998-2002	2003-2007	2008-2012	2013	2014
<i>million m³ roundwood equivalent/year</i>							
Imports	38.6	39.7	52.3	59.0	54.2	48.3	53.8
...including roundwood	2.4	2.0	2.2	2.8	2.0	1.6	2.2
including veneer and plywood	1.1	0.9	1.1	1.4	1.6	0.8	2.0
...including sawn timber	3.6	3.7	5.4	6.9	5.7	4.4	4.5
...including sawmill by-products	0.5	0.9	0.7	0.9	0.9	0.9	1.8
...including reconstituted wood panels	1.0	0.9	1.2	1.5	1.8	2.6	1.6
...including pulp	8.8	9.1	9.3	9.6	8.0	7.2	8.9
...including old paper	3.5	4.2	4.6	4.3	3.3	2.9	3.6
...including paper/paperboard	14.3	14.5	21.7	23.0	20.6	16.7	17.9
...including furniture	2.1	1.9	3.1	4.8	5.5	4.8	4.9
...including packaging	0.5	0.6	1.0	1.1	1.7	2.2	2.7
...including miscellaneous objects	0.5	0.7	1.1	1.3	1.4	2.1	1.4
...including industrial buildings	0.3	0.3	0.8	1.3	2.0	2.1	2.2
Exports	24.8	26.8	38.3	46.4	48.1	43.7	47.0
...including roundwood	4.7	2.8	4.7	4.6	6.8	6.5	5.6
including veneer and plywood	0.6	0.7	0.7	0.6	0.7	0.3	0.5
...including sawn timber	2.4	2.1	2.4	2.7	1.9	1.8	2.2
...including sawmill by-products	1.1	0.8	1.2	1.5	1.2	1.0	1.5
...including reconstituted wood panels	1.0	1.5	2.1	3.2	2.4	3.9	3.1
...including pulp	1.8	2.2	2.4	2.9	3.1	1.6	2.8
...including old paper	2.2	2.6	3.8	6.8	11.5	11.0	10.9
...including paper/paperboard	9.1	11.3	16.4	19.3	16.4	14.2	14.9
...including furniture	0.8	1.0	1.6	1.8	1.5	1.0	2.7
...including packaging	0.8	1.1	2.0	2.1	1.7	1.4	1.3
...including miscellaneous objects	0.2	0.3	0.4	0.4	0.3	0.7	1.3
...including industrial buildings	0.3	0.5	0.6	0.6	0.4	0.4	0.2
Balance	-13.8	-12.9	-13.9	-12.6	-6.1	-4.6	-6.8

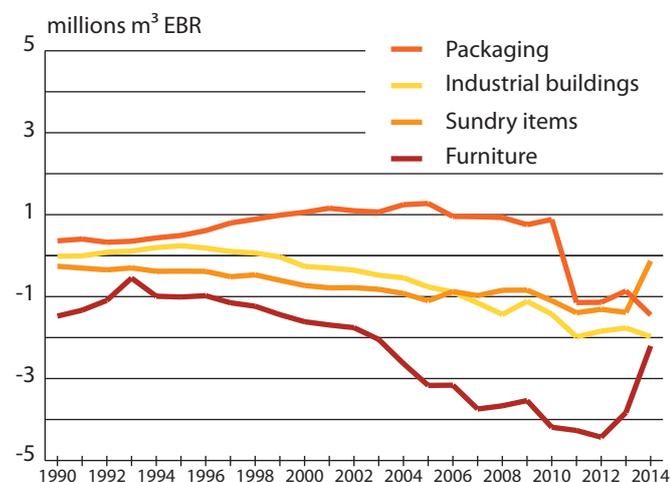
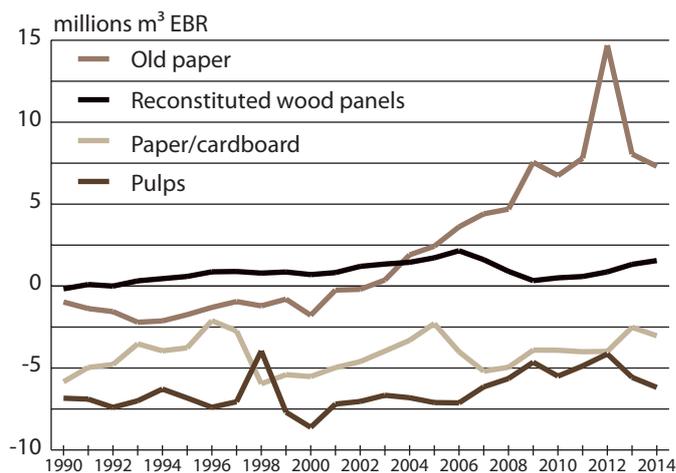
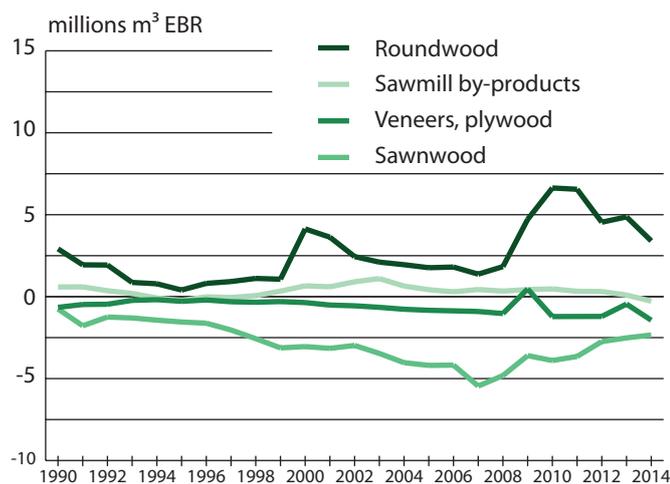
Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

6.8.a.1. Structure in import and export volumes in the forest-timber sector in 2014



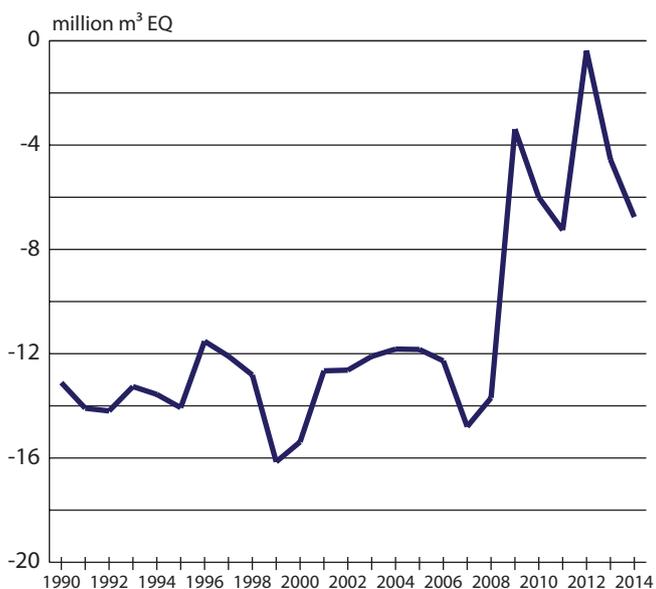
Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

◆ 6.8.a.2. Volume of the 2000-2014 trade balance per branch



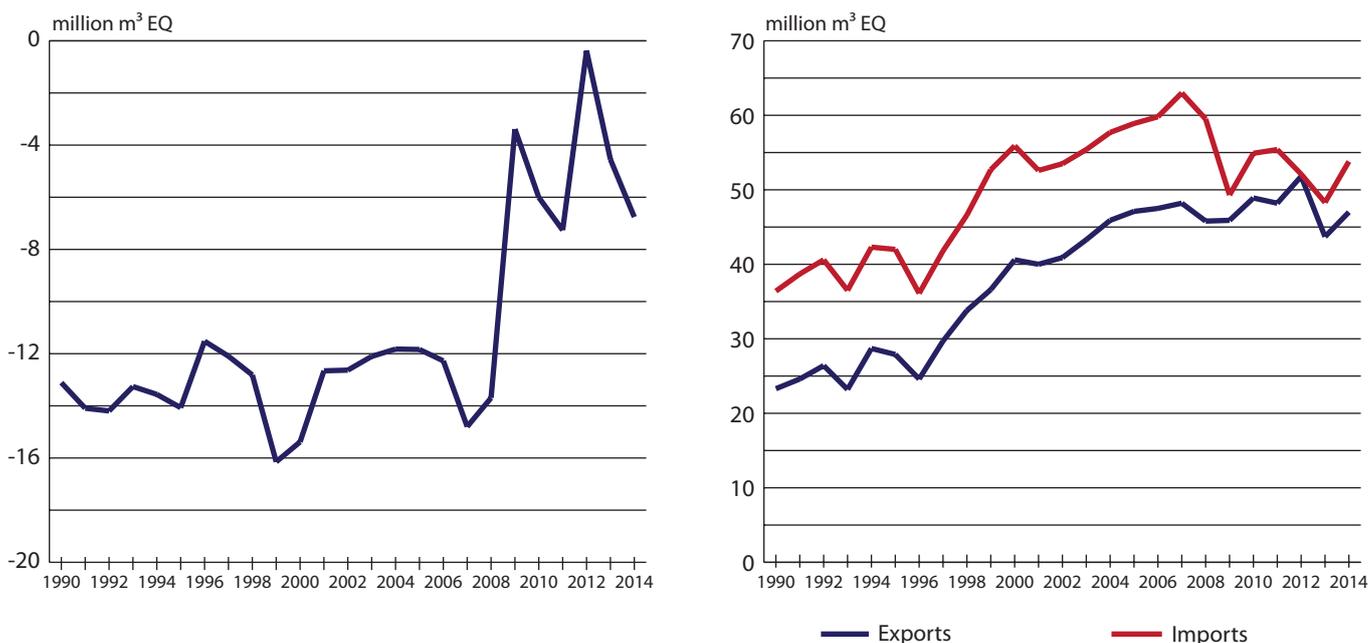
Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

◆ 6.8.a.3. Volume of the trade balance of the forest-timber sector in volume



Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

◆ 6.8.a.4 Comparison in volume of imports and exports in the forest-timber sector



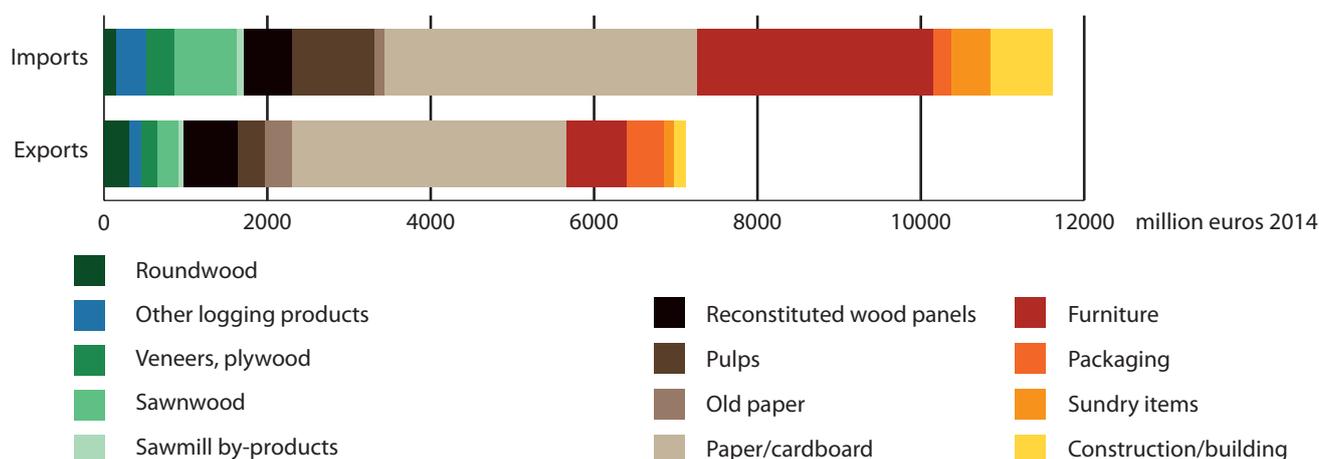
Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

◆ 6.8.b. Value of imports and exports in the forest-timber sector

	2000-2002	2003-2007	2008-2012	2013	2014
<i>million euros 2014/year</i>					
Imports	14,076	13,621	13,010	11,723	11,617
...including roundwood	344	300	183	126	149
...including other logging products	493	435	380	358	367
including veneer and plywood	374	417	368	326	347
...including sawn timber	1,004	1,116	959	763	757
...including sawmill by-products	34	49	56	71	90
...including panels	481	529	630	629	594
...including pulp	1,583	1,107	1,068	1,121	1,002
...including old paper	151	118	119	106	127
...including paper/paperboard	5,711	5,037	4,388	3,977	3,824
...including furniture	2,764	3,142	3,283	2,792	2,894
...including wooden packaging	226	220	228	209	225
...including miscellaneous objects	416	481	521	467	472
...including construction/building	495	670	827	778	771
Exports	9,315	8,812	7,808	7,149	7,119
...including roundwood	416	282	306	284	300
...including other logging products	154	150	148	139	156
including veneer and plywood	334	286	211	173	187
...including sawn timber	382	364	254	229	260
...including sawmill by-products	60	63	74	82	70
...including panels	588	745	610	629	664
...including pulp	288	248	311	328	330
...including old paper	145	200	353	344	329
...including paper/paperboard	4,652	4,403	3,818	3,460	3,360
...including furniture	1,339	1,190	965	754	736
...including wooden packaging	451	444	418	445	456
...including miscellaneous objects	179	158	146	128	127
...including construction/building	328	278	193	154	144
Balance	-4,761	-4,810	-5,202	-4,574	-4,497

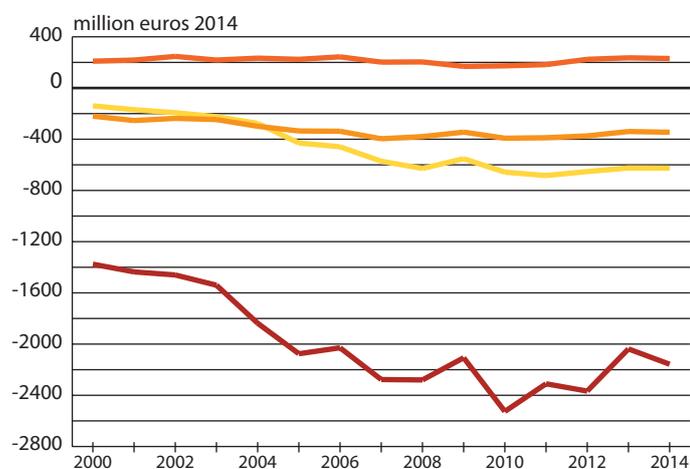
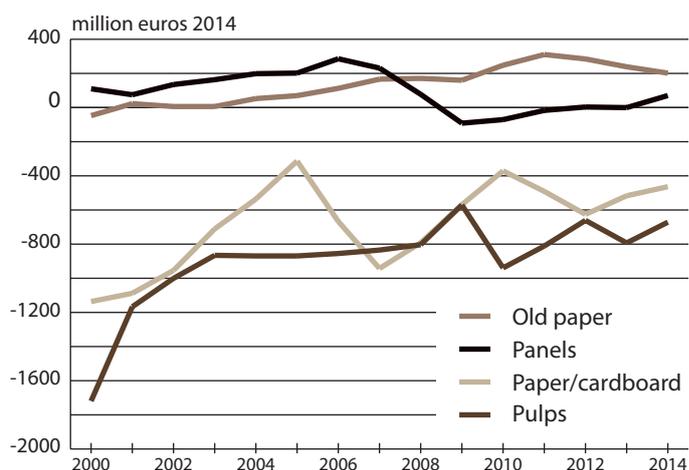
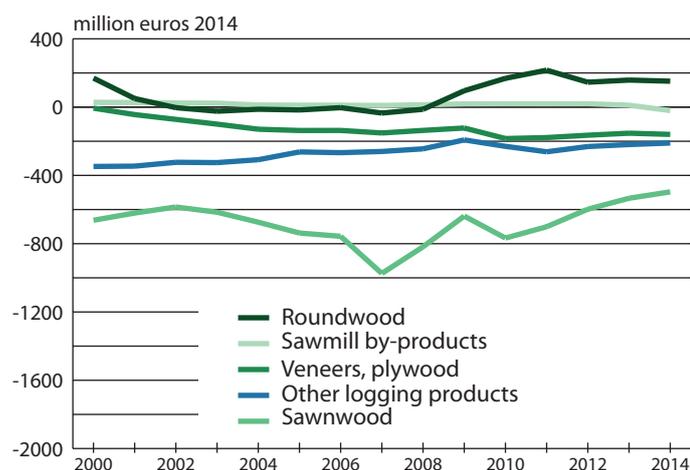
Source: Agreste – Timber and by-products economic conditions Area covered: Whole of France (excl. overseas territories) and World.

◆ 6.8.b.1. Structure in value of imports and exports in the forest-timber sector in value in 2014



Source: Maaf, Statistics and Forecasting Department, Agreste – Timber and by-products economic conditions Area covered: Whole of France (excl. overseas territories) and World.

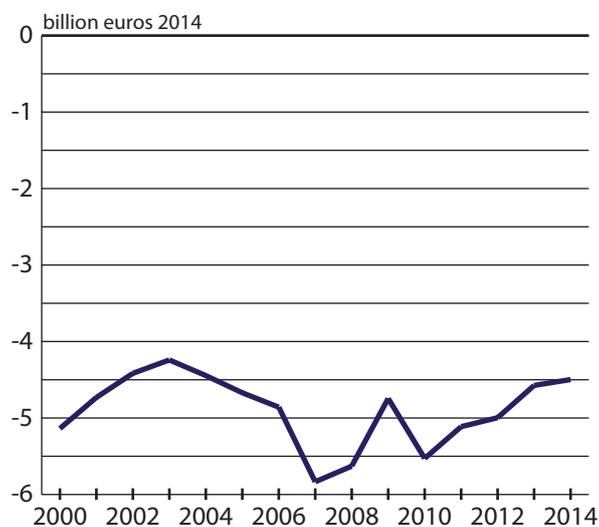
◆ 6.8.b.2 Value of the 2000-2014 trade balance per branch



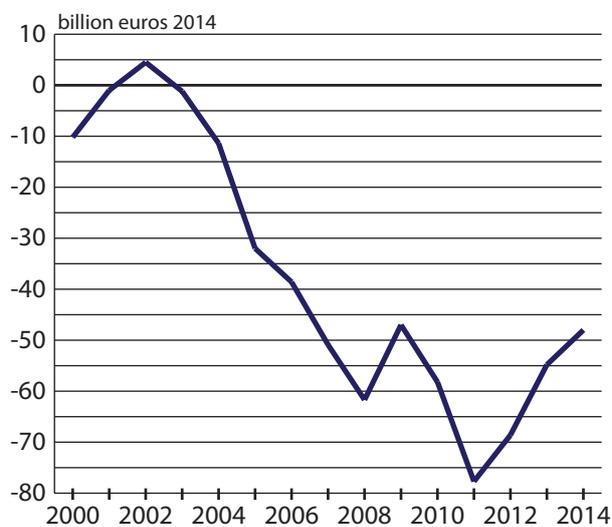
Source: Maaf, Statistics and Forecasting Department, Agreste – Timber and by-products economic conditions
Area covered: Whole of France (excl. overseas territories) and World.

◆ 6.8.b.3. Comparison in value of the forest-timber sector trade balance and the French trade balance

Changes in the trade balance for the forest wood paper furniture sector

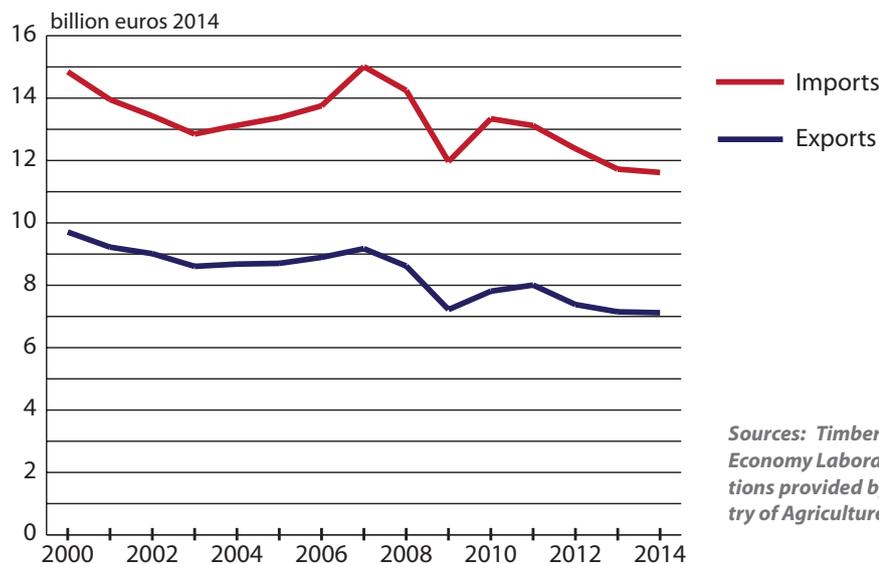


Balance of the French trade balance



Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

◆ 6.8.b.4. Comparison in value of imports and exports in the forest-timber sector



Sources: Timber sector management charts prepared by the Forestry Economy Laboratory from Customs data published by Agreste and estimations provided by the Statistics and Forecasting Department of the Ministry of Agriculture.

■ Analysis

The forest-timber-paper-furniture sector external trade has been discussed, studied and analyzed at length (Agreste 2014, 2015, Chamber of Agriculture, 2014, Timber committee, 2014, Levet *et al*, 2014, CGAAER 2015, etc.). Regardless of the calculation method, the forest-timber-paper-furniture sector trade balance shows a chronic deficit in both volume and value. However, it seems that the deficit has tended to decrease over the last five years in both volume and value. External trade was deeply affected by the 2008 crisis which saw a significant downturn in trade.

Trade balance in volume

In 2014, imports of timber and processed products are estimated at 53.8 million m³ roundwood equivalent (EQ) (6.8.a). The main imported products are paperboard (32%), pulp (17%), furniture (9%) and sawn wood (8%) (6.8.a.1). Exports are around 47 million m³ EQ (Table 6.8.a). The main exported products are paperboard (33%), old paper (23%), roundwood (12%) and panels (6%) (6.8.a.1). The trade balance therefore shows a deficit of 6.8 million m³ EQ in 2014 (6.8.a).

The trade deficit in the forest-timber sector relates mainly to the pulp (-6 million m³ EQ), paper and paperboard (-3 million m³ EQ), sawn timber (-2.5 million m³ EQ) and furniture (-2 million m³ EQ) sectors (6.8.a.2). Conversely, external trade of old paper (+7 million m³ EQ), roundwood (+3.4 million m³ EQ) and reconstituted wood panels (+1.5 million m³ EQ) has a credit balance (6.8.a.2).

Having almost doubled between 1990 and 2007 (36 to 63 million m³ EQ), the volume of imports in the sector has dropped considerably to 54 million m³ EQ in 2013 (6.8.a.4). The structure of imports is relatively stable compared with 1990. The main imported products are paperboard (37% in 1990, 33% in 2014), old paper (8% in 1990, 7% in 2014), furniture (6% in 1990, 9% in 2014)

and sawn timber (9% in 1990 and 8% in 2014) (6.8.a.1). The proportion of pulp and roundwood in imports has dropped, from 23% and 6% in 1990 to 17% and 3% in 2014 respectively (6.8.a).

Export volumes followed roughly the same trend until 2007. This increase noted since the early 1990s continued, however, until 2012 (23 to 52 million m³ EQ), before dropping to 47 million m³ EQ in 2014 (6.8.a.4).

The structure of imports is fairly different compared with 1990. In 1990, France mainly exported paper and paperboard (33%), roundwood (22%), sawn timber (10%), old paper (8%) and industrial building (7%). In 2014, the proportion of paper and paperboard is virtually identical (32%), roundwood only accounted for 12% of exported volumes, sawn timber only 5%, whilst, conversely, old paper saw its proportion rise (23% of exported volumes in 2014) and 6% for the industrial building branch. Panel exports expanded, from 3 to 6% of exported timber volumes (6.8.a).

The result is a fairly contrasting changed in the trade balance in volume: there is a huge deficit up to 2008, with slight dip between 2003 and 2006 (globally between -12 and -16 million m³ EQ, before achieving close to balance in the following years (between -7.3 and -0.4 million m³ EQ) (6.8.a, 6.8.a.3). The year

2008 seems to mark a break in the trade balance in volume, which drops from -14 million m³ EQ in 2008 to -3 million m³ EQ in 2009. This break is mainly due to a decline in imported volumes of all products.

The roundwood trade balance displays a credit balance over the entire period, with upwards and downwards periods alternating. It was the main branch with a surplus volume trade balance in 1990 with a positive balance of nearly 3 million m³ EQ. It is second behind the "old paper" branch in 2014 with a balance of 3.4 million m³ EQ. The sawmill by-product branch improved its external trade balance between 1998 and 2003, stabilized close to balance up to 2013 before returning to a deficit in 2014.

The packaging branch shows a trade surplus until 2010. It becomes a negative balance in 2011. The panels branch improves its balance until 2006 then declines until 2009. The sawn timber branch external trade, close to balance at the start of the 1990s, declined strongly until 2007 before an apparent recovery in 2014.

The external trade balances for the industrial building, veneer and miscellaneous objects branches remain close to balance but with a downward trend. The furniture branch showed a rapid decline in external trade from the middle of the 1990s, but seems to have picked up in the most recent years. Pulp and paper and paperboard have alternated between improved and declining external trade balance in volume, but remain among the main deficit items in the forest-timber-paper-furniture sector.

Overall, in 2014, the sectors with surplus international trade in volume have performed better in 2014 than in 1990 and deficit sectors are slightly less in 2014 than in 1990 (6.8.a.3), hence a global improved in the trade balance in volume in the forest-timber-paper-furniture sector (6.8.a.4).

Trade balance in value

Imports of timber and processed products are estimated in 2014 at 11,617 million euros, including 33% for paper and paperboard, 25% for furniture, 9% for pulp, 7% for construction and 6% for sawn timber. Roundwood only accounts for 1% of the value of imports in the sector (6.8.b and 6.8.b.1).

Exports are in the order of 7,119 million euros in 2014, including 47% for paper and paperboard, 10% for furniture, 9% for panels, 6% for packaging, 5% for pulp and 5% for old papers. Roundwood accounts for 4% of the value of exports in the sector (6.8.b and 6.8.b.1).

The trade balance therefore shows a deficit of -4,497 million euros in 2014, mainly due to the imports of high added value products, i.e. over 8% of the global French external trade deficit. (6.8.b and 6.8.b.3).

In 2014, four of the thirteen activity branches in the sector show a trade surplus: old paper (€202 million), packaging (€231 million), roundwood (€152 million) and panels (€70 million). Sawmill by-products (-€20 million in 2014, the first year with a deficit), veneer (-€160 million) and the other logging products (-€210 million) show low to moderate negative trade balances. Conversely, the miscellaneous objects (-€346 million), paper and paperboard (-€464 million), sawn timber (-€497 million), construction/building (-€626 million), pulp (-€671 million) and above all furniture (-€2,157 million) show huge deficits.

According to the Agreste Conjoncture data prepared using Customs data, for 2014:

- Exports of timber and timber by-products are mainly destined for the European Union:
 - Roundwood: 72% EU, 20% China,
 - Sawn timber: 65% EU, 12% North Africa, 8% non-EU Europe, 6% China,
 - Veneer and plywood: 90% EU, 3% non-EU Europe,
 - Pulp: 82% EU, 7% China, 5% South-East Asia,
 - Bulk paper and paperboard: 77% EU, 4% non-EU Europe, 4% North America,
 - Processed paper and paperboard: 78% EU, 6% non-EU Europe, 3% Sub-Saharan Africa, 3% North America.
- Imports of timber and timber by-products come mainly from the European Union:
 - Roundwood: 70% EU, 17% Sub-Saharan Africa,
 - Sawn timber: 73% EU, 8% Russia, 6% Sub-Saharan Africa,
 - Veneer and plywood: 84% EU, 5% Sub-Saharan Africa, 4% China,
 - Pulp: 55% EU, 32% South America, 8% North America,
 - Bulk paper and paperboard: 93% EU,
 - Processed paper and paperboard: 85% EU, 7% China,
 - Furniture: 72% EU, 16% China.

France's main European partners for imports and exports of timber by-products are Germany, Belgium, Spain and Italy.

Overall, Europe is a net exporter of timber and timber products (excluding paper, paperboard and furniture – State of Europe's Forests, 2011). However, the western countries (United Kingdom, Italy, France, Netherlands and, to a lesser extent, Spain and Belgium) are net importers.

Imports and exports show a global downward trend in value in the period 2000-2014. The amount of imports which was nearly 15 billion euros in 2000 reached slightly more than 11.5 billion euros in 2014, i.e. a drop of 22%. Exports dropped from nearly 10 billion euros in 2000 to 7 billion euros in 2014, i.e. a drop of 27%. The 2008 crisis seems to be marked by an overall decline in external trade (mainly a significant drop in imports) (6.8.b.4).

This means that the trade balance in value is fairly stable and shows a chronic deficit of about 5 billion euros 2014 over the entire period (6.8.b.3). Thus, although the volume of French external trade seems to be close to balance at the end of the period, its value continues to show a considerable deficit.

The structure of imports and exports in value per branch is relatively stable over the period. The main products imported are paper and paperboard, sawn timber and pulp. The proportion of paper and paperboard and pulp in the imports in value is tending to decrease – 40% and 14% in 2000 to 33% and 9% in 2014 respectively -, whereas the proportion of sawn timber rises from 19% to 25% of the value of imports (6.8.b). In terms of exports, the proportion of paper and paperboard is around half the total value of exports and the proportion of sawn timber has dropped slightly, from 14% in 2000 to 10% in 2014 (6.8.b).

Only the packaging branch of the thirteen branches considered in the trade balance calculation shows a surplus balance over the entire period. The roundwood external trade balance shows a “slight” trade deficit between 2001 and 2008, but seems to have recovered

its surplus of the beginning of the period since then. The old paper external trade balance has improved over the entire period. The panels trade balance, which showed a surplus at the beginning of the period, was affected considerably by the 2008 crisis: the branch trade balance dropped from +230 million euros 2014 in 2007 to -90 million euros 2014 in 2009; it is once more showing a surplus in 2014 with a balance of +70 million euros. Among the largest contributors to the trade balance deficit in the forest-timber-paper-furniture sector, sawn wood, paper and paperboard and pulp have fluctuated the most over the period, but although they are stilling showing deficit there seems to be a tendency to improve. The construction branch trade deficit worsened until 2011 before stabilizing at the end of the period around -620 million euros. The furniture branch shows the largest trade deficit in 2014 of -2,160 million euros in 2014. (6.8.b.2)

The trade balance curves of the forest-timber-paper-furniture sector and the trade balance of all French goods external trade show similar upward or downward trends.

■ Data sources and methodology

To analyze external trade, the sector is considered in its broadest acceptance consistent with the other economic indicators (6.2, 6.3 and 6.5 mainly).

The trade balance plots the volume and value of exported and imported goods. To calculate the trade balance in volume, imports and exports of goods are estimated from customs statistics for goods converted into a single, uniform unit – the cubic meter roundwood equivalent. To calculate the trade balance in value, the national accounting assesses the imports and exports of goods from customs statistics for goods. The term trade surplus (it has a surplus trade balance) is used if the export value is more than the import value; if imports are greater than exports, the country has a trade deficit or its trade balance is showing a deficit.

For the 2015 edition of *Sustainable management indicators* (SMI), the entire series was recalculated using the same data sources and the same categories of products instead of two “Restricted range” and “Expanded range” in the 2010 edition. The values presented here cannot be compared entirely with those in the previous SMI editions. In addition, the multiple conversions, estimations and possible methodological breaks in this series makes caution essential in executing time comparisons.

Imports and exports in volume

◆ Producer of data

The data used for this indicator are taken from timber sector management charts prepared by the *Forestry Economy Laboratory* from *Customs* data published by *Agreste* and estimations provided by the *Statistics and Forecasting Department (SSP)* of the *Ministry of Agriculture*. The customs' data have been incomplete since 2006 as information on detailed trading volumes is not mandatory. The SSP therefore produces estimates to compensate for this lack of information – <<http://www6.nancy.inra.fr/lef>>

◆ Methodology

The available data are used to calculate this indicator over the period 1990-2013. The data in volume for the various products in basic units (m³, tonnes) are converted into “cubic meter roundwood equivalent” (EQ) using conversion coefficients. For the roundwood, the volume data are also shown as overbark using technical coefficients.

The following products are considered: roundwood, veneer and plywood, sawn wood, sawmill by-products, reconstituted wood panels, pulp, old paper, paper and paperboard, furniture, packaging, industrial building, miscellaneous objects. This indicator therefore covers a broader field than the corresponding *Forest Europe* international indicator.

Imports and exports in value

◆ Producer of data

The data used for this indicator are published by: *Agreste – Timber and by-products economic conditions Area* covered: Whole of France (excl. overseas territories) and World.

Internet site (link as at 30/04/2015): <<https://stats.agriculture.gouv.fr/disar/faces/report/welcomeReport.jsp>>

◆ Methodology

The available data are used to calculate this indicator over the period 2000-2014. For time comparisons, the data have been corrected for inflation and converted into euros 2014 using conversion coefficients provided by Insee. <<http://www.insee.fr/fr/service/reviser/calcul-pouvoir-achat.asp>>

The following products are considered: roundwood, other logging products and miscellaneous logging products, sheets for veneer and plywood, sawn wood, sawmill by-products, reconstituted wood panels (particle board, fiber board, fiber-chip board), pulp (chemical and mechanical pulp + other wood pulp), old paper (paper and paperboard for recycling), gross paper and paperboard; furniture, packaging (structures for packaging and transport + cooperage), industrial building (wools, wood for parquet flooring, densified wood, joinery, prefabricated construction), miscellaneous objects (cross beams, charcoal, frames, objects for the table, decorative objects, manufactured objects). This indicator therefore covers a broader field than the corresponding *Forest Europe* international indicator.

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6.9. Fuelwood

6.9.a. Proportion, quantity and origin of fuelwood in the national energy consumption

6.9.a.1. Proportion in volume of different products in fuelwood consumption in 2013

6.9.a.2. Proportion of different sources in energy consumption in 2013

Purpose of the indicator

This indicator presents the proportion of wood in the national energy consumption (6.9.a). It underlines especially the proportion of different sources of fuelwood in 2013 (6.9.a.1) and the relative proportion of fuelwood in global energy consumption (renewable and non-renewable) (6.9.a.2).

It gives an idea of the development of the fuelwood sector which is a major challenge in renewable energies and which is paid particular attention in combating the greenhouse effect under the auspices especially of the "climate" convention, the European Union's "energy climate" package and the French "low carbon" strategy.

Results

6.9.a. Proportion, quantity and origin of fuelwood in the national energy consumption

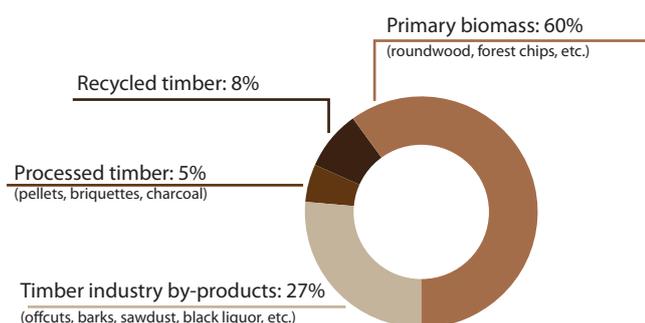
	2007		2009		2011		2013	
	Terajoule	million m ³						
Energy directly from the woody biomass	262,611	27.1	233,069	24.0	281,586	29.0	268,218	27.7
...including direct energy from forests and other wooded land	190,413	19.6	141,523	14.6	144,343	14.9	208,169	21.5
...including direct energy from trees outside forests	69,395	7.2	73,337	7.6	51,551	5.3	55,757	5.7
Energy from co-products of the timber industry	73,619	6.7	128,154	11.6	67,688	6.2	134,000	12.2
...including energy from offcuts, bark, chips and sawdust	46,486	4.8	96,618	10.0	44,066	4.5	87,824	9.1
Energy from processed woody fuels (pellets, briquettes, charcoal)	4,814	0.7	7,767	1.2	13,112	1.8	17,542	2.4
Energy from recycled timber	18,625	2.1	19,196	2.2	14,554	1.6	34,184	3.8
Total fuelwood consumption	359,669	36.6	388,186	39.0	376,940	38.6	453,944	46.1
Renewable energy consumption	707,008	-	798,308	-	765,769	-	975,705	-
National energy consumption (primary)	11,313,304	-	10,873,777	-	10,802,838	-	10,856,257	-
Proportion of wood in national energy consumption	3%	-	4%	-	3%	-	4%	-
Proportion of wood in renewable energies	51%	-	49%	-	49%	-	47%	-

Sources:

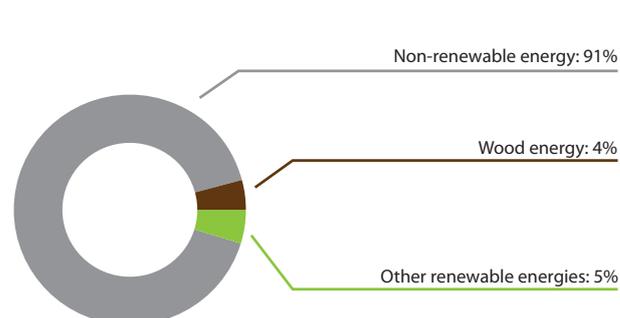
SOeS, Medde, according to the survey by the International Energy Agency (AIE) Eurostat 2007, 2009, 2011, 2013.

SSP, Maaf, according to the Joint Wood Energy Enquiry (JWEE) FAO 2007, 2009, 2011, 2013.

6.9.a.1. Proportion in volume of different products in fuelwood consumption in 2013



6.9.a.2. Proportion of different sources in energy consumption in 2013



Source: SSP – Maaf, according to JWEE FAO 2013

Source: SOeS, Medde, according to the survey IEA Eurostat 2013

■ Analysis

Fuelwood accounts for nearly half (47%) of renewable energy consumed in France in 2013 and 4% of the entire national energy package. Wood logs and forest chips directly from the forest head the list of fuelwood sources (61%) but their proportion is dwindling with the more frequent use of recycled timber and the upsurge of new products like wood pellets and briquettes.

Table 6.9.a indicates the primary energy consumption in France, the proportion of renewable energies and of wood-related energy. It uses the same headings as the biennial survey of the *Food and Agriculture Organization of the United Nations* (FAO) of fuelwood, which differentiates between:

- products, roundwood or forest chips destined directly for the production of energy;
- timber industry co-products (offcuts, sawdust, bark, sawmill chips, black liquor from the paper pulp manufacturing process, etc.);
- processed woody fuels (charcoal, pellets and briquettes);
- recycled timber.

In 2013, the equivalent of 46 million m³ of wood was required to provide this energy, a significant rise since the introduction of measures to increase the proportion of renewable energies to achieve the target objective of 23% by 2020. Although fuelwood has made huge progress globally between 2007 and 2013, the data cannot be compared directly from one year to the next as they have become more complete and

accurate over the years.

Graph 6.9.a.1 shows that in 2013 most fuelwood (61%) came from burning roundwood and forest chips directly from the forest. The timber industry by-products, which cover bark, sawdust, miscellaneous sawmill offcuts and co-products from paper pulp manufacture, come in second place with 26% of the energy consumed. Recycled timber come third, providing 8% of the fuelwood. The new products, pellets and briquettes are making very swift progress, reaching 5%.

Graph 6.9.a.2 shows the proportion of fuelwood which accounts for nearly half the renewable energy total. It also highlights the supremacy of non-renewable energies (91%).

■ Data sources and methodology

◆ Producer of data

Ministry of Ecology, Sustainable Development and Energy – Observation and Statistics Department <<http://www.statistiques.developpement-durable.gouv.fr>>

Ministry of Agriculture, Agrifood and Forests – Statistics and Forecasting Department <<http://www.agreste.agriculture.gouv.fr>>

◆ Methodology

Link to Indicator 3.2: the volume indicated in the line “energy directly from woody biomass” in Table 6.9.a comes from the sum of the volume of firewood (marketed and non-marketed) indicated in Table 3.2.a, with bark removed for inclusion in the co-product category. For example: the 27.7 million m³ indicated in 2013 in Table 6.9.a correspond to the 6.9 + 25.1 = 32 million m³ of firewood (marketed + non-marketed) in 2013 with bark (4.3 million m³) deducted.

The “energy” data in Table 6.9.a have been prepared using total fuelwood consumption data which have then been listed as per the types of product figuring in the FAO survey on energy from wood.

Definitions and results of the JWEE, FAO survey available online on: <<http://www.unece.org/forests/jwee>>

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6.10. Public access to the forests

- 6.10.a. Forest area per inhabitant, at national level
- 6.10.b. Forest area per inhabitant, per department
- 6.10.c. Forest area per inhabitant, per municipality
- 6.10.d. Number of forest visits by the general public
- 6.10.e. Proportion of private forests visited
- 6.10.f. Proportion of private forests open to the public, per administrative region

Purpose of the indicator

Public access to forest spaces is a social issue of prime importance which can be tricky to measure. This indicator addresses the question from several viewpoints: a comparison of forest areas with the number of inhabitants at national, department or municipal scales (**6.10.a, b and c**), forest visitor number surveys of the general public (**6.10.d**) and lastly a survey of private forest owners on numbers of visitors to their forest (**6.10.e**) and the opening of their forest to the general public (**6.10.f**).

This indicator therefore assesses the forest area per inhabitant at different scales and brings in the practices of visitors and of private owners towards them.

Results

◆ 6.10.a. Forest area per inhabitant, at national level

	1993	1998	2003	2006-2010	2008-2012
Metropolitan population (1000 inhabitants)	57,369	58,299	60,102	62,135	62,765
Metropolitan forest areas (including poplar plantations) (1000 ha)	14,811	15,220	15,408	15,137	16,418
Forest surface area per inhabitant in metropolitan France (ha)	0.26	0.26	0.26	0.24	0.26

Sources: Maaf-SSP, Insee, IGN

Clarifications:

For the metropolitan population:

Years 1993 to 2003: Insee, general population census, estimations as at 1 January of the year.

Years 2006-2010: Insee, according to the surveys of 2006 to 2010.

Years 2008-2012: Insee, definitive value for 2010.

For the metropolitan forest area:

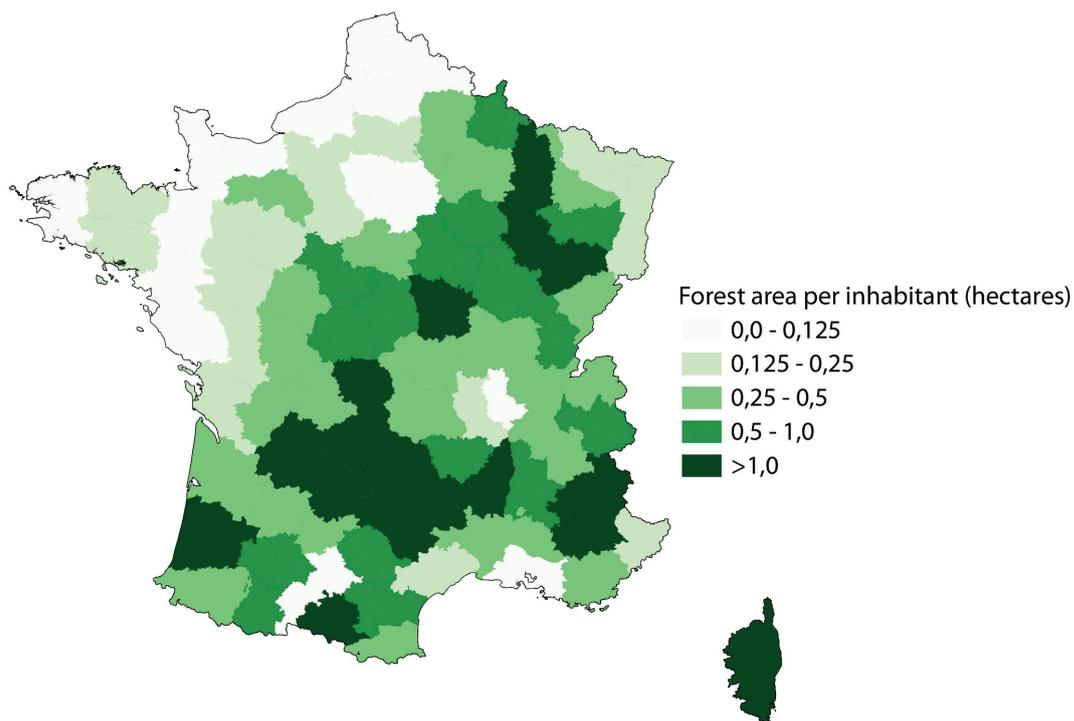
Years 1993 to 2003: source Maaf-SSP, Teruti annual survey of the use of the territory.

Years 2006-2010: source Maaf-SSP, Teruti-Lucas annual survey of the use of the territory (2010).

Years 2008-2012: IGN, inventory campaigns 2008 to 2012.

Changing the source for the forest area (move from Teruti-Lucas to IGN) results in a jump in the forest area.

◆ 6.10.b. Forest area per inhabitant, per department

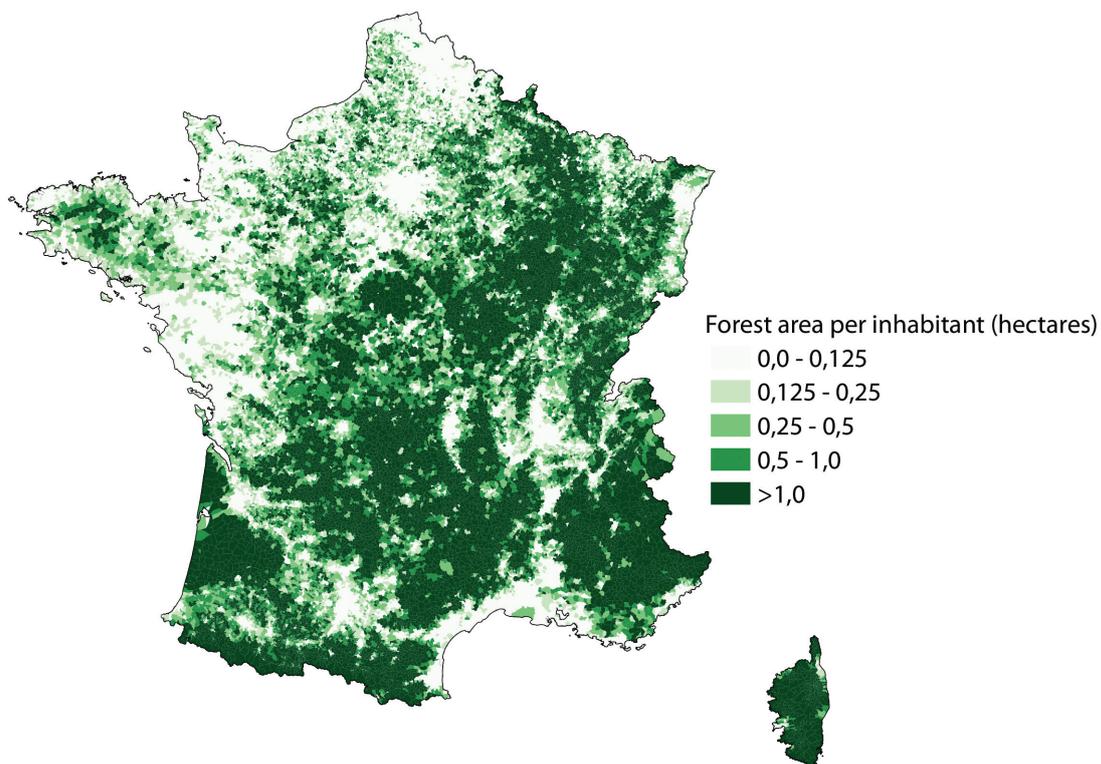


Sources: IGN (BD Forêt®) and Insee

Clarifications:

BD Forêt® (IGN), version 2 for certain departments and "végétation express" for the others (mean year 2008, between 2004 and 2013).
Insee, metropolitan population 2012 (provisional value of end 2014).

◆ 6.10.c. Forest area per inhabitant, per municipality



Sources: IGN (BD Forêt®) and Insee

Clarifications:

BD Forêt® (IGN), version 2 for certain departments and "végétation express" for the others (mean year 2008, between 2004 and 2013).
Insee, metropolitan population 2012 (provisional value of end 2014).

◆ 6.10.d. Number of forest visits by the general public

	1995	2004	2010	2015
	% of responses (during the 12 months prior to the survey)			
Every day or nearly		3	3	3
Once a week		12	9	18
Sub-total: at least once a week (since 2004)/very often (1995)	22	15	12	21
Once a fortnight		11	9	13
Once a month		16	12	17
Sub-total: at least once a month (since 2004)/often (1995)	33	42	33	51
Several times a year (since 2004)/2015 rarely (1995)	26	29	22	36
Sub-total: at least once a year	81	71	55	87
Never	19	29	45	13

Sources:

Medde-SOes: Year 1995

ONF-University of Caen: Years 2004 and 2010 (face-to-face interview) and 2015 (Internet survey).

Forest estate involved: public and private forests

Clarifications: Moving to an Internet survey in 2015 makes direct comparison with the previous surveys difficult.

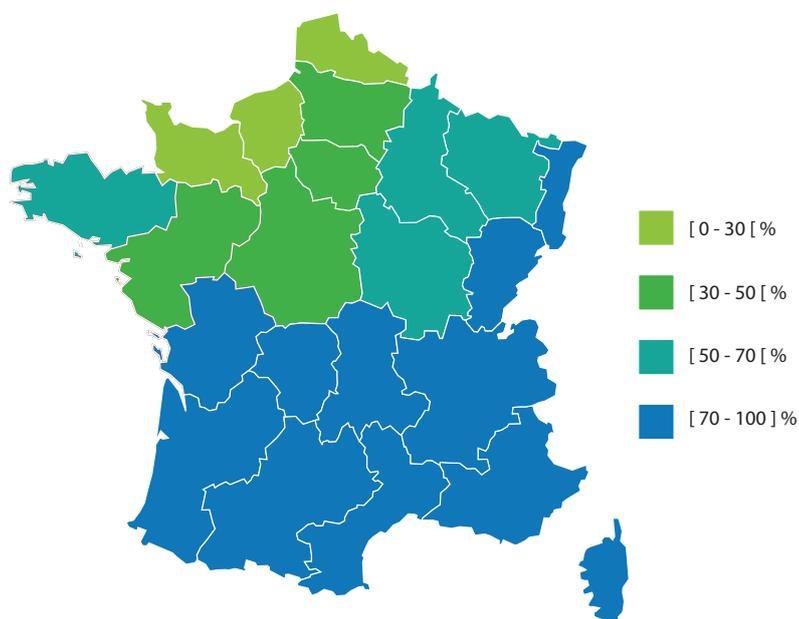
◆ 6.10.e. Proportion of private forests visited

	1999		2012	
	Number of owners (x 1000)	Wooded surface areas (1000 ha)	Number of owners (x 1000)	Wooded surface areas (1000 ha)
Total	1,118	9,848	1,142	9,751
With a forest visited by the general public	75%	84%	72%	80%
- infrequent visits	51%	46%	53%	54%
- moderate visits	19%	25%	15%	21%
- frequent visits	5%	12%	4%	6%
Stating that the public causes no inconvenience	87%	67%	75%	59%
Tolerating the gathering of minor products	88%	78%	31%	32%

Sources: Maaf-SSP, surveys on the structure of private forests in 1999 and 2012.

Forest estate involved: Private holdings of more than one hectare, excluding owners residing abroad and who have responded to a simplified questionnaire.

◆ 6.10.f. Proportion of private forests open to the public, per administrative region



Sources: Maaf-SSP, survey on the structure of private forests in 2012.

Forest estate involved: Private holdings of more than one hectare, excluding owners residing abroad and who have responded to a simplified questionnaire.

■ Analysis

The metropolitan forest area counted in number of inhabitants is 0.26 hectare (6.10.a). The forest areas per inhabitant are largest in the central-southern departments of France and in Lorraine, the Landes, Provence-Alpes-Côte d'Azur and Corsica (6.10.b). More than half of French people state that they visit a forest for recreation purposes at least once a year (6.10.d) and in 2012 the vast majority of owners (85%) stated that they opened their forests to the public, accounting for nearly three quarters of private forest areas (6.10.f).

The average forest area per inhabitant in metropolitan France is 0.26 ha in mean year 2010 (6.10.a); this value has been stable since 1993 thanks to an increase in forest area at the same time as an increase in the population. The maps (6.10.b and 6.10.c) show logically that in sparsely-populated and fairly wooded areas (or very wooded like the Landes and Dordogne), more than one hectare of surface area is available per inhabitant (Lozère, Alpes-de-Haute-Provence, Corse, Hautes-Alpes, Ariège, Landes, Lot, Haute-Marne, Cantal, Meuse, Creuse, Corrèze, Aveyron, Dordogne and Nièvre). It is low in highly-urbanized areas (Île-de-France, outskirts of Lyon, Toulouse, Bordeaux, Nantes or Strasbourg). On the other hand, in areas with a less dense population, even in regions with little woodland, the proportion of accessible forest per inhabitant is often fairly high (more than 0.25 ha, even 0.5 ha).

Of the territories with little woodland and not very densely populated, only the departments on the north-west coast have less than 0.125 ha per inhabitant on average, which in fact reflects a population distribution mainly near the coast: Finistère has an average below 0.125 ha whereas a good number of municipalities in the department go well beyond this value.

According to the ONF-University of Caen survey, in 2015, 87% of French people visited a forest at least once a year (6.10.d). This result cannot be compared directly with the 2004 and 2010 figures given the move to an Internet survey in 2015, but it confirms the popularity of a forest outing as a leisure activity with a low assumption of 770 million visits in the year.

In 2015, sporting activities in a forest environment were analyzed specifically: occurring most frequently are walking (54% of the population), hiking for more than two hours (39%), running races, jogging (21%), cycling on roads and good paths (19%) and mountain biking (19%). More than two-thirds of sports enthusiasts practice several sports and their profile is fairly distinctive according to the activities.

According to the survey of the private forest structure by SSP in 2012 (6.10.e and 6.10.f), the vast majority of owners of private forest of one hectare and more (85%) state that they allow free access to their forest, which accounts for 72% of the private forest area. Most of them consider that the public causes little inconvenience, if any. Prohibited access is conveyed by signs (23% of surface areas) or physical barriers (5% of surface areas). They are more often applied by legal entities (33% of them, representing 48% of their surface area) than natural persons (14% of them, representing 22% of their surface area). The private forests in Normandy and Nord-Pas-de-Calais are the least accessible to the public.

The proportion (80%) of private forests actually visited is very high (80%), but visitor numbers are only considered high by 4% of owners and are limited to 6% of the surface area.

Half the owners (60% of surface areas) have declared gathering minor products on their holding as another forest use, but less than one third of all owners (32% of surface areas) tolerate this and 14% (22% of surface areas) have stated that it occurs on their land. A small number (5%) state that they reserve it for themselves.

The significant surface areas available per inhabitant can be related to the results of the private forest survey, which suggest fairly low pressure from recreation activities on the forests.

■ Data sources and methodology

◆ Producer of data

Ministry of Agriculture, Agrifood and Forestry – Statistics and Forecasting Department (SSP) - <http://www.agreste.agriculture.gouv.fr>

National Institute of Statistics and Economic Studies – <http://www.insee.fr>

National Institute of Geographic and Forestry Information – <http://www.ign.fr>

Ministry of Ecology, Sustainable Development and Energy – Observation and Statistics Department - <http://www.statistiques.developpement-durable.gouv.fr>

National Forest Office – <http://www.onf.fr>

◆ Methodology

Private forest surveys (SSP)

The SSP surveys of 1999 and 2012 used the land registry as a surveying base, with the owner of 1 ha and more of forests in one department as the statistical unit listed.

The 2012/1999 changes should be viewed with caution as the values were declared.

Forest areas available per inhabitant (Insee and IGN)

Table **6.10.1**: the surface area is the statistical area given by the IGN Forest Inventory Department and the population is the definitive population of 2010 given by Insee on its Internet site.

Maps **6.10.b and c**: the surface area used for the calculation is the mapping surface from the IGN BD Forêt® (version 2 for the fully-available departments and “végétation express” layer for the other departments, i.e. a 2008 mean versions, reflecting aerial photographs taken between 2004 and 2013). The population per department and per municipality is a provisional Insee datum for 2012.

The private forest survey results (declared) should be considered as an under-estimation of the proportion of (accessible) forest and the mapping results as an over-estimation (or potential access), as firstly, they do not take into account forests where access is impossible (prohibited, for example) and secondly, the mapped forest area incorporates elements that are not strictly forest (paths, bodies of water, etc.). No distinction is made between the different types of leisure activities in forests.

◆ Bibliography

Ministry of Agriculture-Agrete, 2013. Structure of the private forest in 2012 – Production objectives for one third of owners, *Agreste Primeur*, 306, Montreuil-sous-bois, 4 p.

Ministry of Agriculture-Agrete, 2014. Structure of the private forest in 2012, *Agreste figures and data*, 222, Montreuil-sous-bois, 75 p.

Ministry of Agriculture-Agrete, 2002. Structure of the private forest in 1999, *Agreste figures and data*, 144, Paris, 94 p.

Ministry of Agriculture, 1987. Private forest ownership 1976-1983, Agricultural statistics collection, *SCEES studies*, Paris, 268, 104 p.

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6.11. Forests with cultural or spiritual value

6.11.a. Forest sites with recognized cultural or spiritual value

Purpose of the indicator

The cultural or spiritual value of forests is without doubt very important for the populations but also very difficult to measure. The aim of this indicator is to count the forest sites with a recognized cultural or spiritual nature and if possible give their surface area (**6.11.a**). The sites considered here have received a label or officially-recognized international or national classification.

Forests with particular cultural or spiritual leanings can therefore be identified.

■ Results

See next page

◆ 6.11.a. Forest sites with recognized cultural or spiritual value

Categories Forest Europe	Categories France	Source	Date of data	Number	Forest surface area (ha)	Details
Cultural heritage sites	World Heritage Site	UNESCO INPN and IGN for the forest area by crossing the geographical information layer (INPN) with the forest points from the inventory (campaigns 2005-2013 for further clarification)	2015	2	Less than 15,000 ha (insufficient forest inventory points to qualify the surface area accurately)	1) Golfe de Porto: calanche de Piana, golfe de Girolata, Scandola Nature Reserve 2) Pyrénées, Mont-Pertdu
	Registered and classified historical monuments in State-owned forests	Mérimée database of the Ministry of Culture and Communication verified for localization in FD by ONF	2010	204	-	
Forested landscapes with cultural and spiritual values	MAB reserves (Man and Biosphere)	UNESCO INPN (2013) and IGN (campaigns 2005-2013 for further clarification) for the forest area by crossing the geographical information layer (INPN) with the forest points from the inventory	2015 (for the current number of UNESCO reserves) 2013 (for the INPN layer) 2005-2013 (for the IGN forest inventory campaigns)	Eleven in the INPN layer of September 2013 There are twelve biosphere reserves in metropolitan France, with one which has no forest (Iroise Sea)	1,511,000 ± 32,000	The INPN layer (Sept. 2013) used to calculate the forest area includes the following biosphere reserves (the three areas are counted: cooperation area, buffer zone and central zone are counted): Bassin de la Dordogne, Cévennes, Iroise Sea, Luberon, Mont-Ventoux, Pays de Fontainebleau, Vallée du Fango, Vosges du Nord, Camargue, Marais Audomarois, Mont Viso
	Classified and registered sites, large sites ...including classified sites identified in State-owned forests ...including classified sites identified in the other forests governed by the forestry regulations	Medde ONF ONF	not available 2013 2013	not available 173 738	not available 86,796 87,047	i.e. 5% of the surface area of State-owned forests. i.e. 3% of the surface area of other forests governed by the forestry regulations
	Trees with cultural and spiritual values	Unusual stands in State-owned forest Unusual trees in State-owned forests	ONF ONF	2010 2010	14 181	
Other sites with cultural and spiritual values	Arboretums managed by ONF	ONF	2014	about 150		including 15 of national interest, including 7 of heritage interest. i.e. 3% of the surface area of State-owned forests.
	Forêt d'Exception Label allocated in State-owned forests	ONF	2015	4	49,140	Territorial consultation and dialog process: 4 regions, 5 departments, 111 municipalities and 3 regional nature parks involved in these 4 forest massifs.

Sources and clarifications: identified in the table

■ Analysis

The cultural and symbolic dimensions of the forest feature highly in the imagination of French people. The majority portrayal of the forest as “heritage to be passed on to future generations” and as a “nature reservoir” testifies to this, as underlined in a survey by ONF and the University of Caen in 2004 and 2010 (Dobré, 2006; Granet, 2012). Forest sites with strong cultural or symbolic value include sites classified as partially wooded, arboretums in public forests, biosphere reserves, world heritage sites, unusual trees and stands and *forêts d'Exception* in State-owned forests.

The law defines **classified sites** as sites where conservation or preservation is of general interest from an artistic, historical, scientific, legendary or scenic viewpoint. Some sites fall under several criteria. All forestry work likely to alter the state or appearance of the classified site must have a permit issued by the Minister responsible for the sites. The surface areas of State-owned and municipal forests under forestry regulations in classified sites account respectively for nearly 90,000 ha, i.e. about 5% of State-owned forests and 3% of municipal forests. This is a significant proportion and illustrates the protective role of the forestry regulations in conserving forest massifs in sensitive areas subject to major land pressure: peri-urban areas, coastal areas and mountain and Mediterranean areas.

French **arboretums** are a biological heritage which can sometimes be undervalued. They have an enormous biological diversity, rare species (endangered, vulnerable or symbolic) and very special ecosystems. In France, 144 arboretums are in public forests and are managed by the *National Forest Office*. They vary in size, origin and design and therefore have different features. All arboretums were analyzed in 2006-2007. They were rated using three criteria deemed decisive in identifying sites of national interest:

- conservation interest (at least ten wild species classed as threatened or extinct included on the National Red List of threatened species, with each one having at least ten individuals);
- scientific interest (presence, with at least ten individuals, of at least one species of known origin in at least one other arboretum with interesting characteristics in terms of forthcoming changes in climate);
- heritage interest: interest linked to the variety of the collection, the history, the presence of unusual individuals or attraction of the landscape. In State-owned forests, this inventory has identified fifteen arboretums of potential national interest and as such justifies a specific management policy.

The *National Forest Office* launched the **unusual trees** inventory in public forests in 1996. They are defined using dendrological (size, age), aesthetic (stem shape, foliage, roots) or cultural (historical, religious, ethnographic value) criteria.

These trees are generally not legally protected but they are taken into account in forest management plans. The National Forest Office thus conducted local inventories with regional and national harmonization and four interest levels. Around 181 trees and groups of trees and 14 unusual stands and tree rows were recognized as being of national interest in State-owned forests.

The **Forêt d'Exception**[®] qualification is based on confirmed and shared values of the forest heritage: biodiversity, landscapes, cultural and forest elements and social heritage. The sites involved are designated to form a network representative of the wealth and diversity of State-owned forests. These emblematic forests have a recognized heritage foundation and testify to the continuous, marked relationship between man and the forest over the centuries. Four labels have been awarded between 2012 and 2015 (State-owned forests of Fontainebleau, Verdun, Grande Chartreuse and Rouen).

■ Data sources and methodology

◆ Producer of data

National Forest Office – <<http://www.onf.fr>>

Unesco-Man and Biosphere – <<http://www.mab-france.org/fr/reserves-de-biosphere/>>

National Inventory of the Natural Heritage – <<http://inpn.mnhn.fr>>

National Institute of Geographic and Forestry Information – <<http://www.ign.fr>>

◆ Methodology

National Forests Office

Data on historical monuments, arboretums and unusual trees or stands in State-owned forests have not been updated since the last version of SMI. These data are internal to ONF (with cross-references to the Mérimée base for the historical monuments).

The *Forêt d'exception*® label in State-owned forests is recent. It is appearing in the SMI for the first time. It is a label specific to State-owned forests and the Labelling Committee is made up of representatives of bodies outside ONF. The public forest areas in classified sites come from GIS cross-referencing by ONF between the national forest layer under forestry regulations (source ONF) and the boundary limits of classified or registered sites (source Dreal).

UNESCO – Man and Biosphere

Current biosphere reserve numbers are provided by MAB France.

INPN-IGN

Biosphere reserve forest areas

Using the geographical information layer on the INPN Internet site, a statistical forest area is calculated by crossing them with the IGN forest inventory points on these boundaries. As many inventory campaigns available as possible (campaigns 2005 to 2013) have been used to make the value more accurate. The INPN layer used includes the following reserves: Bassin de la Dordogne, Cévennes, Camargue, Iroise Sea, Lubéron, Marais audomarois, Mont Ventoux, Mont Viso, Pays de Fontainebleau, Vallée du Fango, Vosges du Nord. The last reserve created in 2015, the Gorges du Gardon, is not included in the INPN layer. All biosphere reserve areas are taken into account (cooperation area, buffer zone and central zone).

Forest areas in the natural World Heritage Sites

The forest area has been calculated in the same way as for the biosphere reserves. Given that few national forest inventory points fall in these areas, it is impossible to give a precise forest area in these sites.

◆ Bibliography

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