Prospects for the market supply of wood and other forest products from areas with fragmented forest-ownership structures

Task II

Case study: Catalonia/Spain

Centre Tecnològic Forestal De Catalunya (CTFC)
Forest Harvesting and Biomass Area

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1 Introduction

This study has been prepared in the framework of the project “Prospects for the market supply of wood and other forest products from areas with fragmented forest-ownership structures”.

The present case study provides quantitative and qualitative information about the situation of the forest sector in the region of Catalonia, focused on fragmented forest private ownerships.

Data compilation procedure included the following phases:

- Secondary data search (documents, books, articles and data bases) about forest ownership. This task took place from the very beginning of the project.

- Expert interviews: technicians, forest administration, forest ownerships, forest operators and industry, representing all Catalonia territory. This task has been developed since November 2009 until January 2010, visiting personally each expert.

- Focus group: two focus groups have been developed in January 2010. According to the experts availability, one focus group meeting took place in Solsona (Lleida) and the second was in Santa Coloma de Farners (Girona). Both places are strong poles in the forest activity of Catalonia. Attendance reached 7 and 8 persons respectively.

Data compilation, analysis and document preparation has been in charge of the Forest Harvesting and Bioenergy Department of the Forest Technology Centre of Catalonia (CTFC).

Participating experts have been:

- Eng. Pere Josep Navarro Maroto: interviews, FG’s, data compilation, analysis and document preparation


- Eng. Mireia Codina i Palou: document preparations and interviews support

- Dr. Glòria Domínguez i Torres: FG’s support

- Eng. Ignacio López Vicens: translation support
2 Overview

2.1 What is the total forest (incl. plantation, not other wooded land) cover in the region?

2.1.1 Total cover forest in percent of the total area?

About 63.51% of the total Catalonia area are Forests and other wooded land (IDESCAT\(^1\), 2007). Cover figures vary according to the source (Table 1).

Table 1. Forest areas according to different sources

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalonia total area</td>
<td>3,199,011</td>
<td>3,208,938</td>
<td>3,187,429</td>
<td>3,199,011</td>
<td>3,208,592</td>
<td></td>
</tr>
<tr>
<td>Forest &amp; other wooded land (Forests + Shrubland + Other)</td>
<td>1,938,601</td>
<td>2,038,037</td>
<td>1,961,855</td>
<td>1,938,281</td>
<td>1,930,482</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>60.60</td>
<td>63.51</td>
<td>61.55</td>
<td>60.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forests</td>
<td>1,214,615</td>
<td>1,231,006</td>
<td>1,332,994</td>
<td>1,214,664</td>
<td>1,626,212</td>
<td>1,373,415*</td>
</tr>
<tr>
<td>Shrubland</td>
<td>525,904</td>
<td>648,144</td>
<td>515,917</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (grasslands, barren land, etc.)</td>
<td>198,082</td>
<td>158,887</td>
<td>197,699</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-forest (no-timber)</td>
<td></td>
<td></td>
<td>625,891</td>
<td></td>
<td>304,720</td>
<td></td>
</tr>
</tbody>
</table>

* It's not specified if shrubs are/aren't included

2.1.2 Development of the total forest area during the last 10 years (approx)

Statistical data show an increasing trend in forest cover development (IDESCAT).

---

\(^1\) IDESCAT: Institut Català d’Estadística, Catalan Institute of Statistics.

\(^2\) SIGPAC does not disgress object forest areas according to types.
The share of forests showed a slight decrease because of shrub lands increase.

According to MARM\(^3\) data, in 1986 forests occupied 920,502 ha out of 1,787,643 ha of all forests & other wooded lands (forests+shrublands+other). In 2000, this forest area increased 0.75% resulting in 927,430 ha out from 1,930,482 ha of total forest cover.

From the data showed on Graphic 1 (IDESCAT 2001-2007), forests occupied in 2001 48% of the total forested area (1,902,856 ha), while in 2007 it was 60.4 % out of a total of 2,038,037 ha.

2.1.3 What future development can be expected?

Wooded land is expected to increase because of land abandonment (crops, grasslands and other rural activities) (Alfaras 01/12/2009; Rovira 03/12/2009; Angel & Minguell 04/12/2009; Famadas 01/12/2009; Riera 30/11/2009). There will be –as today- blocked stands, with low increments, burned areas with high tree densities (Angel & Minguell 04/12/2009), increase of shrublands, and a lack of regeneration fellings (Angel & Minguell 04/12/2009; Famadas 01/12/2009).

Briefly, the main trends are woodland increase and standing volume accumulation.

2.2 What is the wood mobilisation in terms of annual increment?

2.2.1 How much is the annual harvest in cubic meters over bark? (including fuel wood)

Average annual fellings in Catalonia are between 600,000 m\(^3\) ob and 883,980 m\(^3\) ob, depending on the source:

- 777,072 m\(^3\) ob (DMAH statistics 2000-2007)
- 600,000 m\(^3\) ob (Serradora Boix 10/12/2009; Jané 20/11/2009)
- 883,980 m\(^3\) ob (DIBA-OTPMIF studies of 2005 and 2006)

\(^3\) MARM: Ministerio de Medio Ambiente Rural y Marino, Ministry of Environment, Rural areas and Sea
From roundwood harvests, coniferous species represent 77% whilst broadleaves 23%. With respect to firewood, more than 86% come from broadleaved species and 13% from coniferous. Roundwood represents 69% of the total harvest while firewood represents 31%, in Catalonia.

2.2.2 How much is the annual increment in cubic meters over bark?

The annual increment in Catalonia is 3,173,380.05 m³ o.b./year (IFN3-IFN2), with an average figure of 2.61 m³ ob/ha/year.

2.2.3 How did it develop during the last 10 years (approx.)?

Before 2004, the production was more or less constant. In 2004 there was an increase of demand for building wood (not structural wood, but for making building works). Besides this, there is an increasing trend in elaboration of planning documents for wood properties, thus easing felling and silvicultural treatments (Angel & Minguell 04/12/2009).

Since 2008, wood markets have experienced two important changes. First, with the beginning of the economic crisis on 2008, wood products demand was significantly reduced. Second, storms in 2009 left big amounts of low quality wood on closed markets, taking wood prices down.

Table 2: Evolution of annual harvests (m³ o.b./year) (DMAH, 2010⁴)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total fuelwood</th>
<th>Total roundwood</th>
<th>Harvest volume in total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>204,977</td>
<td>394,623</td>
<td>599,600</td>
</tr>
<tr>
<td>2001</td>
<td>232,971</td>
<td>485,078</td>
<td>718,049</td>
</tr>
<tr>
<td>2002</td>
<td>192,619</td>
<td>491,334</td>
<td>683,953</td>
</tr>
<tr>
<td>2003</td>
<td>265,129</td>
<td>502,144</td>
<td>767,273</td>
</tr>
<tr>
<td>2004</td>
<td>183,578</td>
<td>446,205</td>
<td>629,783</td>
</tr>
<tr>
<td>2005</td>
<td>312,125</td>
<td>821,584</td>
<td>1,133,709</td>
</tr>
<tr>
<td>2006</td>
<td>275,319</td>
<td>584,349</td>
<td>859,668</td>
</tr>
<tr>
<td>2007</td>
<td>236,408</td>
<td>588,133</td>
<td>824,541</td>
</tr>
<tr>
<td>Average</td>
<td>237,891</td>
<td>539,181</td>
<td>777,072</td>
</tr>
</tbody>
</table>

⁴ Forest Service, DMAH (Department of Environment and Housing)
2.2.4 What future development can be expected?

It is not clear, mainly depending on the market demand (Famadas 01/12/2009; Vilalta 30/12/2009). In that sense, there has been a long-lasting trend (20 years or more) of closures of small sawmills, and consolidation of some bigger ones. This trend has become more evident since 2008 (Jané 20/11/2009; Domenjó 10/12/2009).

And so, the number of forest operators and workers has also been decreasing (Garolera 30/11/2009; Pujol 20/11/2009; Riera 30/11/2009; Serradora Boix 10/12/2009).

From Focus groups (FG-1 and FG-2) arised the possibility that the bioenergy sector can take off, and then harvestings can increase.

Thus, the expected trend would be to maintain a sustained activity of the current harvestings if demand –mainly bioenergy- does not change.
2.3 Is there legal uncertainty regarding forest ownership

2.3.1 The presence of a restitution process in the region?

There is no restitution process in Catalonia.

Only some economical obligations for the owners, as i.e. (CPF): 

- Forest properties transfer: It is necessary to pay the VAT and a tax for inheritance and donations (ISD: Impost de successions i donacions).
- Real estate tax (IBI: Impost de bens immobles)
- Individual income tax (IRPF: Impost sobre la renda de les persones fisiques)
- Companies tax (hardly ever imposed to forestry activities, because of the variability of forest harvestings)

However, there are other processes occurring as i.e. private forest properties purchased by public administration, forestlands abandonment (FG-1, Vilalta 30/12/2009), properties segregation (Garolera 30/11/2009), land use changes and property acquisition by non-forest-owners (Alfaras 01/12/2009).

2.3.2 Description of a restitution process in the region?

Although they are no restitution processes, some changes in forest ownership can be mentioned:

- **When public administration is purchasing forest properties** (Riera 30/11/2009): public administration contacts the owner and acquires the property. It is not a widespread process. This only happens in some protected or natural interest areas, where public administration wants to ensure the ecosystems protection.

- **Properties segregation** (Garolera 30/11/2009; Alfaras 01/12/2009): Some segregation process is happening in the peri-urban areas. Some properties are sold to new owners in order to build 2nd residences or for other uses i.e. leisure.

- **Land abandonment** (Vilalta 30/12/2009): A common reason for forest management and harvesting abandonment is low profitability of forest, ranching and agriculture activities.

- **Land use change** (Garolera 30/11/2009; Alfaras 01/12/2009; Riera 30/11/2009; FG-1): Sometimes forest ownership, coming from agroforestry tradition- shifts to a businessman/woman from the tertiary sector. This mainly happens near urban areas or around turistic places.

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http://mediambient.gencat.net/cat/cpf/fiscalitat/
2.4 How can the forests in the region be characterized?

2.4.1 The average stock per hectare in cubic meters over bark?

The standing volume is 102,054,392 m³ ob (IFN³), with a 3% of this amount from dead trees.

<table>
<thead>
<tr>
<th>Trees (stems/ha)</th>
<th>Average</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alive</td>
<td>Dead</td>
</tr>
<tr>
<td></td>
<td>768</td>
<td>25</td>
</tr>
<tr>
<td>Standing volume (m³ ob/ha)</td>
<td>89</td>
<td>2</td>
</tr>
<tr>
<td>Stem biomass (odt/ha)</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Total aerial biomass (odt/ha)</td>
<td>74</td>
<td></td>
</tr>
</tbody>
</table>

* In some areas of Catalonia, there is an important presence of dead trees. Sometimes large numbers of dead trees is atributed to the lack of forest management or to forest ageing. Some studies about this topic are currently in progress.

2.4.2 The shares of coniferous and non-coniferous wood

Regarding the forest area, 54.5% is dominated by confierous, while 45.5% are deciduous and sclerophyllous (broadleaves).

According to the IFN³ (2000-2001, CREAF) the distribution of forest land according to the dominating species is the following:

<table>
<thead>
<tr>
<th>Non coniferous/Broadleaved</th>
<th>Coverage (ha)</th>
<th>Stock (trees)</th>
<th>Coniferous</th>
<th>Coverage (ha)</th>
<th>Stock (trees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Castanea sativa</td>
<td>9,664.59</td>
<td>10,656,351</td>
<td>Abies alba</td>
<td>14,773.49</td>
<td>11,400,912</td>
</tr>
<tr>
<td>Fagus sylvatica</td>
<td>27,484.72</td>
<td>22,451,303</td>
<td>Pinus halepensis</td>
<td>203,850.85</td>
<td>105,050,043</td>
</tr>
<tr>
<td>Quercus ilex</td>
<td>241,418.94</td>
<td>247,703,109</td>
<td>Pinus nigra</td>
<td>109,474.88</td>
<td>90,152,659</td>
</tr>
<tr>
<td>Quercus suber</td>
<td>54,531.34</td>
<td>40,017,256</td>
<td>Pinus pinaster</td>
<td>14,109.96</td>
<td>10,292,312</td>
</tr>
<tr>
<td>Other oaks</td>
<td>107,669.07</td>
<td>79,393,697</td>
<td>Pinus pinea</td>
<td>23,556.61</td>
<td>10,829,665</td>
</tr>
<tr>
<td>Other non coniferous</td>
<td>79,295.08</td>
<td>58,860,688</td>
<td>Pinus sylvestris</td>
<td>181,404.50</td>
<td>136,818,195</td>
</tr>
<tr>
<td>Total</td>
<td>520,063.74</td>
<td>459,082,406</td>
<td>Pinus uncinata</td>
<td>66,060.36</td>
<td>48,523,295</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other coniferous</td>
<td>7,477.94</td>
<td>4,011,922</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>622,855.41</td>
<td>418,364,323</td>
</tr>
</tbody>
</table>

Quercus ilex dominates the most important area of landscape (241,418.94 ha), with the biggest amount of tree numbers (247,703,109 trees/ha). Most commercial species are Quercus ilex, Fagus sylvatica and coniferous. Q.ilex is used mainly for fuelwood, F.sylvatica and coniferous them are used as roundwood, these species are more industrial vocation.

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⁶ IFN³: 3rd National Forest Inventory.
2.4.3 Shares of abandoned and/or unmanaged forests, and the role fragmented ownership plays in this?

Only 30% of the private forests in Catalonia have a planification document (management plan), and these planned forests are mainly in the central and northern part of Catalonia, where ownership size and productivities/yield are higher. There are also plans on these properties that have suffered a forest fire, because that would be to opt for grants.

This planification documents can be:

- Forest management plan (PO, Pla d’Ordenació): the most detailed document for forest planification. It is hardly ever elaborated for private properties, because its elaboration requires a strong effort and it is not so flexible as the other documents (PTGMF, PSGMF).
- Technical plan for forest management and improvement (PTGMF, Pla de Gestió i Millora Forestal): forest planification document for forest properties larger than 25 ha.
- Simple plan for forest management (PSGF, Pla Simple de Gestió Forestal): the only forest planning document for forest properties smaller than 25 ha.

Usually, fragmented private forest properties (smaller than 5 ha) do not have any management plan due to their lack of profitability (Famadas 01/12/2009).
2.4.4 The general topographic situation that may influence wood harvesting in the regions forests

Average slope in Catalonian forest is 46.56 % (IFN3). Thus, more than half the forest area is located on slopes over 45%.

Taking into account that the optimum productivity for a forest tractor is reached in slopes below 10%, and between slopes of 10-50% the productivity sinks to 45%, low profitability is understandable.

In wood harvesting, less than 60% slopes are advisable for yarding, less than 30% for temporary roads, less than 20% for forest roads and the main forests roads should be below 12% (Tolosana, 1998). Therefore, a large part of the forest area is not accessible for harvesting, or a higher road network density is needed.

Flat areas have been historically occupied by crops and agricultural activity. Later, infrastructures (motoways, railways, conduction pipes, etc.) and building took place in some of these areas.

2.4.5 The tree age (class) distribution in the region forest

More than 50% of the standing volume is allocated in ages between 20 and 50 years, and with diameters smaller than 20 cm (IFN3, 2006).

**Graphic 3: Distribution of tree age and number of trees with respect to diameter classes (CREAF-IEFC)**
Catalan forests are characterized by a high number of small diameter trees (mainly below 25 cm DBH), and so big amounts of standing volumes of small trees. This fact has been also emphasized by interviews, although according to forest management experts, forests are not as young as they look like (Angel & Minguell 04/12/2009; Famadas 01/12/2009).

This is the result of the traditional harvesting methods performed till nowadays, where only high quality roundwood, with big diameters, was extracted to ensure an economical profitability. (Palomé 04/12/2009).
2.4.6 Other factors that may influence wood harvesting in the regions forests.

2.4.6.1 Protected areas & wild fauna & pests

In protected areas, forest operations can be limited and restricted, such as fellings or road works (Jané 20/11/2009; Rovira 03/12/2009). There are also cases where there is intention of substituting the species by another more profitable (Garolera 30/11/2009), but it is finally not allowed by the administration because of the rules of the protected area.

There isn’t always a formal restriction, but application procedures are longer, (and more bureaucracy discourages forest owners and operators) and so it is in practice discouraging forest owners and operators.

Figure 2: Private forest surface and protected areas (PEIN)

Table 5: Private forest areas in an area of natural interest

<table>
<thead>
<tr>
<th>Province</th>
<th>Surface (ha)</th>
<th>Share of protected areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lleida</td>
<td>125,001</td>
<td>24.16%</td>
</tr>
<tr>
<td>Tarragona</td>
<td>74,664</td>
<td>14.43%</td>
</tr>
<tr>
<td>Barcelona</td>
<td>163,855</td>
<td>31.67%</td>
</tr>
<tr>
<td>Girona</td>
<td>153,800</td>
<td>29.73%</td>
</tr>
</tbody>
</table>

There are also spatial and temporary restrictions concerning wild fauna and pests.

For example, in mountainous areas is usual to find some protected wild fauna, combined with a difficult accessibility (lack of maintenance, scarce roads, high slopes), and also additional snow and ice restrictions. Therefore, this collection of spatial and temporal limitations does not offer an attractive business for the forest harvester/operator.
Table 6: Calendar limitations for forest harvesting operations regarding wild fauna

<table>
<thead>
<tr>
<th>Species</th>
<th>G</th>
<th>F</th>
<th>M</th>
<th>A</th>
<th>M</th>
<th>J</th>
<th>J</th>
<th>A</th>
<th>S</th>
<th>O</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ursus arctos</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Breeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hibernation</td>
</tr>
<tr>
<td>Tetrao urogallus</td>
<td></td>
<td></td>
<td>Heat (crowning)-nesting-breeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dryocopus martius</td>
<td></td>
<td></td>
<td>Nesting and breeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aegolius funereus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Green months indicate when it is advisable to execute forest operations in areas where the corresponding species is found (Camprodon, 2001).

There are also restrictions in spring because of pest risk (*Ips acuminatus*) mainly for *Pinus sylvestris*. Fight against *Thaumatopoea pityocampa* in pine forests and other pests limits the performance of forest works, as well. In chestnut forests with a treatment against chancre, forest operations are not advised.

2.4.6.2 Forest fire risk

Forest fire risk affects the great majority of forest areas in Catalonia. Since the end of 1998, burnt area and forest fire numbers have been decreasing, thanks to increased resources and efforts.

More mature forests, with less tree density and bigger diameters, could lead to a lower fire risk. Also, coverage division (mosaic landscape) is favourable for large forest fire prevention.

Anyway, the paradox of forest fire extinction shows that as much as the extinction forces are effective, much risk lays in the remaining forest, as larger biomass volumes keep on accumulating.

Then, it can be concluded that silvicultural treatments with low profitability are necessary and advisable to reduce large forest fire risk and to allow better profitability of forests in the future.

Besides this discussion, the forest fire prevention also creates a sort of temporal limitation because in summer, forest operations are only allowed if there is a special administrative authorisation.

![Figure 3: Fire risk in Catalonia](image)

44% of the total area of Catalonia has an elevated forest fire risk, representing 1,420,410.6 ha.
2.4.6.3 Climate

There are different climate types in Catalonia: from semiarid to hypermoist. Areas with higher productivity are where the climate is more humid. In areas with drier climates, forest production (yield) is much lower.

Nevertheless, drier climate places have been historically occupied by most of the cities and villages of Catalonia.

2.4.6.4 Road network

The road network is determining forest harvesting procedures and techniques, and the profitability of the whole operation. According to the main and secondary road network, many private forests are not easily accessible for these harvesting and transport operations.

Average values in Catalonia are given in Table 7 (Centellas & Rodriguez, 2006):
Table 7: Road network in Catalonia

<table>
<thead>
<tr>
<th></th>
<th>Primary roads (m/ha)</th>
<th>Secondary roads (m/ha)</th>
<th>Ways of skidding (m/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.09</td>
<td>24.68</td>
<td>33.95</td>
</tr>
</tbody>
</table>

The figures of Table 7 are the average values for Catalonia. If disaggregated by zones (north, south and center) the variability of the road network is high.

Table 8: Road network comparing different counties (examples of three areas of the region)

<table>
<thead>
<tr>
<th>Counties</th>
<th>Primary roads (m/ha)</th>
<th>Secondary roads (m/ha)</th>
<th>Ways of skidding (m/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gironès (Northeast of Catalonia)</td>
<td>5.8</td>
<td>29.3</td>
<td>63.9</td>
</tr>
<tr>
<td>Ribera d’Ebre (South of Catalonia)</td>
<td>4.5</td>
<td>5.3</td>
<td>0</td>
</tr>
<tr>
<td>Solsonès (Center of Catalonia)</td>
<td>9.2</td>
<td>26</td>
<td>30.8</td>
</tr>
</tbody>
</table>

A forest road network does exist (Vilalta 30/12/2009). This is a conclusion of the interviews. But in most of the network it is necessary to perform improvements, therefore increasing the total harvesting costs (Angel & Minguell 04/12/2009). Some forest owners complain about too accessible forests because of the existence of roads/paths and the small distance from urban areas.

Figure 5: Private forest areas with low accessibility

Taking into account private ownerships more than 1 km far from the main or secondary road network

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7 Primary roads are highways and main roads, where they can move all vehicles.

8 Secondary roads are forest roads where there are restrictions on movement for all types of vehicle
3 The regional wood markets

3.1 The regional wood markets, in terms of wood sellers, industrial buyers, other market participants and other structural market factors?

3.1.1 The structure regional wood markets in terms of wood sellers (forest owners and companies).

3.1.1.1 The number of forest owners

Forests in Catalonia can be divided into four types according to ownership and management:

- State/government ownership (state forests): public administration ownership and management.
- Local administration forests: local authorities ownership and public administration management.
- Forest in consortium: private ownership and public administration management. Also other combinations are possible. It was usual when natural catastrophes happened:
- Private forest ownership: private management and property.

The amount of private forest owners in Catalonia ranges between 174,775 (Llongarriu, 2006) and ca. 160,000 (Rovira 03/12/2009). The amount of registered owners as private forest owners is 3,440, with a surface of 455,216 ha and increasing since the creation of the Forest Ownership Center (20 years).

3.1.1.2 The average annual selling volume in the region by category

These data (DMAI 2000 - 2006) do not provide the wood destination with regards to the property class (public or private), but from the total volume of wood harvested. According to harvesting data, 93% of the total volume comes from private forests. From the available data the evolution of the fellings and sales has been the following:

Table 9: Evolution of the fellings and sales (DMAI 2000-2006)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales volume/year m³.o.b.</th>
<th>Harvests m³ o.b./ year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total*</td>
<td>Public forest</td>
</tr>
<tr>
<td>2000</td>
<td>562,670</td>
<td>599,600</td>
</tr>
<tr>
<td>2001</td>
<td>672,848</td>
<td>718,049</td>
</tr>
<tr>
<td>2002</td>
<td>617,646</td>
<td>683,953</td>
</tr>
<tr>
<td>2003</td>
<td>712,319</td>
<td>767,273</td>
</tr>
<tr>
<td>2004</td>
<td>588,810</td>
<td>629,783</td>
</tr>
<tr>
<td>2005</td>
<td>1,012,703</td>
<td>1,133,709</td>
</tr>
<tr>
<td>2006</td>
<td>755,258</td>
<td>859,668</td>
</tr>
<tr>
<td>Average</td>
<td>726,597</td>
<td>798,739</td>
</tr>
</tbody>
</table>

*Inclou roundwood and fuelwood.

It is necessary to specify however, that the wood production data and use is underestimated (Serradora Boix 10/12/2009) between 15-20% (Famadas 01/12/2009), for certain volumes of timber not enter the statistics for lack of information.
With respect to roundwood harvesting, coniferous species represent 77% of the total amount, whilst broadleaved species are up to 23%. Fuelwood from broadleaved species is 86% of the total fuelwood harvested while fuelwood from coniferous represent less than 13%. Roundwood harvests are 69% of the total volume harvested and the rest 31% is fuelwood.

3.1.1.3 The average selling volume by ownership category and by assortments

There are no official data from the average selling volume by ownership category and by assortments. According to data of the Ministry of the Environment and Rural and Marine Affairs, the average selling volume in Catalonia has been:

<table>
<thead>
<tr>
<th>Assortments</th>
<th>m³ u.b.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawmills</td>
<td>165,920</td>
</tr>
<tr>
<td>Veneer logs</td>
<td>34,385</td>
</tr>
<tr>
<td>Wood of trituration</td>
<td>125,825</td>
</tr>
<tr>
<td>Roundwood posts</td>
<td>30,315</td>
</tr>
<tr>
<td>Other industrial use</td>
<td>28,871</td>
</tr>
<tr>
<td>Others: fuelwood, chips, pelets.</td>
<td>17,506</td>
</tr>
<tr>
<td><strong>Total wood</strong></td>
<td><strong>402,823</strong></td>
</tr>
</tbody>
</table>

The evolution of the sales by assortments in Catalonia has been:

**Graphic 6: Evolution of selling volumes according to destination (MARM, 1996-2006)**

3.1.1.4 The average amount of wood that different ownership size categories within fragmented private forest owners have sold to the market

There are no official data. At the present moment, the forest operations performed in fragmented private areas are aimed at obtaining firewood for self-consumption (Alfaras 01/12/2009) or to prevent forest fires (Vilalta 30/12/2009). Some time ago, charcoal production was profitable in

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9 very different information Table 9, due to: different source estimates longer period of some years with low information (according MARM)
forest areas (Vilalta 03/12/2009), which supposed a complement to agrarian lands (Rovira 03/12/2009).

In northern Catalonia, where the private forest properties are in average bigger, oak species are harvested for firewood production and some other species are felled for roundwood production. (Alfaras 01/12/2009, Garolera 30/11/2009, FG-2 20109). In the center of Catalonia the most common destination is sawnwood and poles (Jané 20/11/2009), and is a complement to the agrarian activity (Rovira 03/12/2009). In southern Catalonia the wood extraction is the smallest; most of the forest operations are aimed at forest fire prevention and little for firewood (Vilalta 30/12/2009). Most of the private forest owners from Montnegre-Corredor sell wood for firewood and cork, but at a very local level (Alfaras 01/12/2009).

There are little commercial fellings in areas less than 5 ha (Serradora Boix 10/12/2009) because the costs would exceed the income. But if this land less than 5 ha is located near to an area where there are commercial fellings, there are more possibilities to work in that one. If there are no subsidies, there is no profitability (Famadas 01/12/2009). There are also opinions that areas less than 10 ha are not profitable due to the operation costs (Jané 20/11/2009).

Most of the private forest owners with properties over 50 ha of forestlands, consider profitable the balance of cost-benefits from forest activity (CFC-CTFC, 2003).

Taking into account that the industry - located at Central Catalonia- that buys 80% of regional wood (Jané 20/11/2009; Serradora Boix 10/12/2009) makes 80 km to buy the wood, The logical conclusion is that the wood consumed mainly comes from forest owners in central Catalonia. There is the same in the area Selva /Osona /Garrotxa /Girona, where there is much industry.

Looking at the data, the results of the interviews and the focus group, it can be concluded that most of the sold wood come from private areas. Cf. 4.1.3.2

3.1.1.5 The average amount of wood that fragmented private forest owners have harvested for their own use (firewood, construction etc.)

There are no data. Properties less than 1 ha are normally used for obtaining self-consumption firewood. (Vilalta 30/12/2009).

3.1.1.6 Indication of the development on the roundwood sellers market structures and explanation of any significant changes over the last approx. 10 years, as well as ongoing trends

In the figure it shown the current distribution of forest companies in Catalonia, which sell or can sell wood:

Figure 6: Estimative number of roundwood sellers
In the region there is the classification of wood traders/sellers (Jané 20/11/2009; Pujol 20/11/2009; Angel & Minguell 04/12/2009; Famadas 01/12/2009):

- Forester: are forest owners who are involved in forestry,
- Public forests: are forest areas managed by the foresters of the administration,
- Forest operators: companies engaged in forest harvesting and selling timber and firewood or fuelwood. They can work both in private forests and in public,

Another actor that performs forest harvestings is the first transformation industry itself (Serradora Boix 10/12/2009). These exploit the forests directly. However they still keep commercial relations with forest companies and operators. These relations are realized in some cases through short term contracts (Palomé 04/12/2009; Riera 30/11/2009).

Traditionally the forest operators carried out the forest harvesting (Garolera 30/11/2009). They also looked for the forests/masses that could interest them to cut. There were also cases where the owner searched the operator to make business (Famadas 01/12/2009). Regardless the way to start working in a forest, the wood was mainly mobilized by the forest operators. These carried out arrangements of roads, cleanings, cuttings, transport and commercialization of wood, earning the benefit and paying the owner a proportional part (Palomé 04/12/2009). The business relation with the owner was mainly with verbal contracts and invoices (Pujol 20/11/2009). There is also the figure of the owner of a big area who worked within his property.

At the present time these actors still stand, but there are more actors entering the sector, reducing the presence of the forest operators and forcing the big owners to dedicate themselves to other services (Riera 30/11/2009).

Big forest owners and foresters operator, apart from carrying out work for timber harvesting, invest in other forestry work. The services that they now do can be: writing planification documents, elaboration of projects, bush cleaning, forest consulting and other associated services (Famadas 01/12/2009; Riera 30/11/2009). Regarding the commerce of wood, the forest operators dedicate to filling up bureaucracy for the forest harvesting. The relations with the owner can be through a contract of exploitation either in paper or verbal (Palomé 04/12/2009).

In certain zones the figure of the forest operator has already disappeared, as it is the case in the south of Catalonia (Vilalta 30/12/2009). In these places some forest companies survive which perform forest works for fire prevention and extinction (Famadas 01/12/2009; Riera 30/11/2009).

3.1.2 The structure of the regional wood markets in terms of industrial buyers

3.1.2.1 The number of industrial buyers in the region

Sawmills in Catalonia form an opaque and little organized productive sector. It is therefore difficult to estimate the real importance of the sector and to discern all the first-stage processing companies (Correal & Rodríguez, 2006).

According to a study carried out by Consorci Forestal de Catalunya (Forest Owners Association), there are 53 first-stage processing companies in the region (CFC, 2007). This amount coincides with the amount given in a study by Rovira (2005) (Table 11), where the number of companies and product types are the same.
Table 11: Number of industry buyers from the first transformation (Rovira, 2005)

<table>
<thead>
<tr>
<th>Industry buyers</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic</td>
<td>24</td>
</tr>
<tr>
<td>Trituration</td>
<td>2</td>
</tr>
<tr>
<td>Construction, wood structure</td>
<td>9</td>
</tr>
<tr>
<td>Liston, pallet</td>
<td>12</td>
</tr>
<tr>
<td>Roundwood posts/poles/RTI</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53</strong></td>
</tr>
</tbody>
</table>

3.1.2.2 Development of the number of industrial buyers during the last 10 years

From the decrease due to the construction boom till now, some sawmills have stopped their activity definitely, especially those which consumed little amounts of wood (Serradora Boix 10/12/2009).

This amount of wood has been reallocated to big sawmills (Serradora Boix 10/12/2009). Many sawmills have changed their traditional economical activity (saw timber) to dedicate to other activities (Correal & Rodríguez, 2006) as for example in the secondary processing industry, manufacture and repair of packing, design and manufacture of other wood products.

3.1.2.3 Total average of the annual buying volume by industrial buyer category and/or assortments

There are no series of this kind of data, but from year 2005 and only related to the industries which buy roundwood (Rovira, 2005).

Table 12: Data the annual consumption (Rovira, 2005)

<table>
<thead>
<tr>
<th>Industry buyers</th>
<th>Annual consumption</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (m³/year)</td>
<td></td>
</tr>
<tr>
<td>Generic</td>
<td>476,123</td>
<td>65</td>
</tr>
<tr>
<td>Trituration</td>
<td>101,500</td>
<td>14</td>
</tr>
<tr>
<td>Construction, wood structure</td>
<td>75,545</td>
<td>10</td>
</tr>
<tr>
<td>Liston, pallet</td>
<td>39,324</td>
<td>5</td>
</tr>
<tr>
<td>Roundwood posts/poles/RTI</td>
<td>22,330</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>17,255</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>732,077</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

3.1.2.4 The share of domestic and imported volume

20 % of the roundwood that is consumed by sawmill industries in Catalonia, comes from France. (Correal & Rodriguez, 2006; Jané 20/11/2009; Serradora Boix 10/12/2009; FG-2).

Analysing the import-export data, some conclusions can be drawn. These are shown in Graphic 7:
According to these and previous data, Catalonia shows a negative balance, with a situation of “net” import of wood products. Nevertheless, it is necessary to clarify that this data shows only international imports-exports. Thus, markets within the rest of Spain are not registered and they should be.

Table 14 shows the imports of wood in Catalonia from different countries during 2009.

Table 14: Main importing countries for wood products\(^\text{11}\) from Catalonia

<table>
<thead>
<tr>
<th>Country</th>
<th>Volume (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>104,657.0</td>
</tr>
<tr>
<td>Germany</td>
<td>26,945.4</td>
</tr>
<tr>
<td>Sweden</td>
<td>14,222.0</td>
</tr>
<tr>
<td>Poland</td>
<td>10,018.1</td>
</tr>
<tr>
<td>China</td>
<td>9,315.0</td>
</tr>
<tr>
<td>Portugal</td>
<td>7,413.9</td>
</tr>
<tr>
<td>Austria</td>
<td>7,365.6</td>
</tr>
<tr>
<td>Italy</td>
<td>5,783.7</td>
</tr>
<tr>
<td>Belgium</td>
<td>5,072.8</td>
</tr>
</tbody>
</table>

There are also wood products coming from Argentina, Brazil, USA, Andorra and the Netherlands.

\(^{10}\) http://customs.camaras.org/

\(^{11}\) CHAPTER 44 of TARIC CODE- wood and articles of wood; wood charcoal
Table 15: Main destination countries for wood products exports from Catalonia

<table>
<thead>
<tr>
<th>Country</th>
<th>Volume (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>23,600.7</td>
</tr>
<tr>
<td>Italy</td>
<td>15,754.5</td>
</tr>
<tr>
<td>Morocco</td>
<td>5,115.5</td>
</tr>
<tr>
<td>Andorra</td>
<td>4,630.2</td>
</tr>
<tr>
<td>Algeria</td>
<td>4,603.0</td>
</tr>
<tr>
<td>Lebanon</td>
<td>2,425.4</td>
</tr>
<tr>
<td>Germany</td>
<td>702.7</td>
</tr>
<tr>
<td>Pakistan</td>
<td>637.3</td>
</tr>
</tbody>
</table>

Wood is also exported to Peru, Panama, Polynesia and Poland.

3.1.2.5 The share of sawmill residues in case of pulp mills, panel mills and heating plants

In general, residues originated in the first-stage processing industry can be around 30-40% (Jané 20/11/2009; Serradora Boix 10/12/2009; FG-2), which can be classified as (Correal & Rodríguez 2006):
- Bark
- Slabs
- Firewood and cutting-edges
- Sawn wood
- Dust and shavings
- Wood chips

Wood chips can represent up to 23% of the residues.

3.1.2.6 The number of traders between forest owners and industrial buyers by industrial buyer category

In general, between forest owners and industrial buyers there are two intermediaries: forest operators (section 2.1.1.6) and owners association’s technicians (Angel & Minguell 04/12/2009). The forest operators harvest, transport and sell wood (Riera 30/11/2009; Pujol 20/11/2009). Technicians manage the performance of the operations and its commerce, by means of subcontracts to other companies (Angel & Minguell 04/12/2009; FG-1). This management and performance is subsided by the provincial council (Diputació de Barcelona).

There are no figures about the total amount of forest operators; however, they are primarily present in central and northern Catalonia (Pujol 20/11/2009; Rovira 03/12/2009; Riera 30/11/2009).

In some cases, forest industries search for available forest owners (Serradora Boix 10/12/2009), removing the intermediate operator. In some other cases the forest owner is the one who looks for the industry (Garolera 30/11/2009).

3.1.2.7 The volume of annual wood that is transferred by regional traders between forest owners and industrial buyers by industrial buyer category

It is difficult to quantify the volume of annual wood that is transferred by regional traders, because it depends on the demand of the companies and the market, which are very variable (Pujol 20/11/2009).

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12 CHAPTER 44 TARIC CODE- wood and articles of wood; wood charcoal
3.1.2.8 Indication of the development on the wood buyers market structures and explanation of any significant changes over the last approx. 10 years, as well as ongoing trends

In Table 16 it is shown the evolution of some macroeconomic indicators for the wood, cork and packaging sector (IDESCAT, 200913).

Table 16: Business volume (Idescat 2005-2007), in thousand euros

<table>
<thead>
<tr>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business volume</td>
<td>4,153,858</td>
<td>4,400,653</td>
</tr>
<tr>
<td>Sales</td>
<td>4,091,127</td>
<td>4,360,525</td>
</tr>
<tr>
<td>Consumption goods</td>
<td>2,943,082</td>
<td>3,108,651</td>
</tr>
<tr>
<td>Purchase goods</td>
<td>2,993,207</td>
<td>3,140,727</td>
</tr>
</tbody>
</table>

Along the three years showed, the Business Volume as well as the Consumption of Goods have increased in the industry. Unfortunately, main statistics are until 2005-2007, so the effects of the 2008 crisis and 2009 storms are still not shown.

The future trend is uncertain. If biomass use for energetic purposes continues growing, we can expect an increased volume of mobilised wood and a better survival of forest companies (FG-1; FG-2; and the total interviews).

3.1.3 The structure of the regional wood markets in terms of other market participants

3.1.3.1 The number of direct buyers/consumers

There are no statistical data on this structure, because in most cases they are very local and with little influence in the sector (Alfaras 01/12/2009; Vilalta 30/12/2009).

3.1.3.2 The availability and capacity of harvest contractors or forest operators

There are no data on the activity level among forest operators. Furthermore, this relation is very dependent on the market (Riera 30/11/2009; Palomé 04/11/2009), on the operation costs (Serradora Boix 10/12/2009) and on productivity (Famadas 01/12/2009).

Considering that a big industry in Catalonia can consume between 500 t of timber/day (Pujol 20/11/2009) and 800,000 t/year of pulp/panel wood (Serradora Boix 10/12/2009), probably all the forest operators could together mobilize more than 1,000,000 m3 o.b.

3.1.3.3 Indication of the development of other market participants and explanation of any significant changes over the last (approx.) 10 years, as well as ongoing trends

During the last 2 years, some forest operators have changed and broadened the scope of their traditional activity in order to perform services such as cleanings, consultancy and biomass development (Riera 30/11/2009). Some of them even impulse or help projects, such as biomass plants (Pujol 20/11/2009). Some other simply trade and perform less forest operations, even exporting wood (Pujol 20/11/2009; FG-2).

A forest operator from Berguedà-Osona area said: “…5 years ago I had 40 workers, 2 skidders, 3 trucks and some horses; now it’s extremely difficult to maintain a transporter and 5 workers…” (Personal communication from Albert Codina, spring 2008).

13 http://www.idescat.cat/industria
3.1.4 The structure of the regional wood markets in terms of other structural market factors

3.1.4.1 The average distance between different types of sellers and different types of buyers

The average distance is now about 80 kms radius from the industry to the forest works, basically because of the costs (Jané 20/11/2009; Serradora Boix 10/12/2009). In some areas, especially in the north-east, this radius can be 50 kms thanks to the short distance from woods to industry (Famadas 01/12/2009). Maximum distances are between 100 kms (Riera 30/11/2009) and 150 kms (Jané 20/11/2009).

If selling the wood is imperative, distances of up to 450 km (Famadas 01/12/2009), to Valencia, Murcia (Spain) or St. Gaudens (France) can be managed.

3.1.4.2 The average harvesting costs to forest road by ownership category (excluding stumpage sales)

Costs vary depending on previous arrangements forest (roads, ways, clearings) (Angel & Minguell 04/12/2009; FG-1). These costs can be up to 72 €/m³ (Angel & Minguell 04/12/2009), where lower costs mean easy-to-operate areas (approx. 20-30 €/m³) and higher costs would be caused by the need to arrange roads, perform cleanings and other unanticipated actions.

3.1.4.3 The average transportation costs from forest to industrial buyer

Approximate cost of transport is around 10 €/t (FG-2). Transport costs can be up to 30-40% of the total cost (Serradora Boix 10/12/2009).

If 30-40% of the total cost is supposed to come from transport (2.1.4.2), the total cost of the wood in industry could be around 35 €/t.

3.1.4.4 The approximate volume of informal market segments not covered by wood supply statistics and the particular role of fragmented ownership in this segment

In general, to execute a forest harvesting operation it is necessary to have a planification document (PTGMF, PSGMF) or, at least, a permission from the competent administration (Garolera 30/11/2009; Riera 30/11/2009; Angel & Minguell 04/12/2009; Serradora Boix 10/12/2009). In this case, when executing the operations, a forest engineer from the administration can visit and supervise them. Forest harvesting is therefore very regulated and covered by forestry statistics.

In the case of the realization of forest works without any type of permission or regulation, control is undertaken by rural agents, a body of the regional administration to watch all what can happen in the forest.

There are some cases in which forest works are realized with the aim of forest fire prevention (Vialta 30/12/2009), which gives firewood as a product commonly taken by people who live next to the forest for particular use, or for self-consumption of the owner (Alfaras 01/12/2009). These so local uses and fellings are not covered by the statistical data of the region.

3.1.4.5 The approximate volume of informal market segments not covered by wood supply statistics to be? What is the particular role of fragmented ownership in this market segment?

There is no official data on wood volume in markets out of the regional statistics.

3.1.4.6 Expectations regarding the development of informal market segments

The forest production is not very much valued and in general returns little income to the owners (Riera 30/11/2009; Famadas 01/12/2009). This fact does not motivate for the realization of
works and operations, and therefore generates a diminishing of the offer of local products on the market.

If the use of forest biomass increases the value of the products and helps to keep costs and prices with some profit, people would mobilize more forest local resource (FG-1). Perhaps in this context could we see some cases of informal markets develop.

3.1.4.7 The reliability of statistics that are available on actual fellings in the region and the covering of small properties in case of systematic over-/underestimation

As said in section 3.1.1.2, the felling data is underestimated, because of the statistical method (Famadas 01/12/2009).

3.1.4.8 The market information access by ownership category (information flows)

Usually the active and dynamic owners look by themselves for the information to realize actions (Garolera 30/11/2009; Pujol 20/11/2009; Rovira 03/12/2009; FG-1; FG-2), whereas the most passive or expectative get to know about the information by means of oral conversations (Ángel & Minguell 04/12/2009; FG-1).

Besides, there are zones of the region where many owners do not know about this information, those active ones as well as others old owners who already have given up the management (Vilalta 30/12/2009).

Many know about the information, but perhaps more dissemination would be necessary with this respect (FG-1).

3.1.4.9 The wood quality requirements by buyer category.

In general, the first-stage process industry requires wood with the following characteristics (Jané 20/11/2009):

- Particle board: smaller Ø >12 cm plus curved or branched trees
- Sawmill: DBH below 60 cm and smaller Ø >12 cm
- Poles: straight stem and cylindrical

<table>
<thead>
<tr>
<th>Industry</th>
<th>Diameter (cm)</th>
<th>Length (m)</th>
<th>Rectitude (cm/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trituration</td>
<td>&gt;7</td>
<td>&gt;1</td>
<td>&gt;5</td>
</tr>
<tr>
<td>Packing</td>
<td>14 (8-20)</td>
<td>&gt;2.4</td>
<td>2-5</td>
</tr>
<tr>
<td>Structural</td>
<td>20 (15-30)</td>
<td>&gt;4.5</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Veneer logs</td>
<td>20 (20-25)</td>
<td>&gt;2</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Roundwood posts</td>
<td>12-20</td>
<td>7-14</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Quality board</td>
<td>&gt;20</td>
<td>&gt;2</td>
<td>2-5</td>
</tr>
</tbody>
</table>

Table 17: Wood requirements according to destination (CPF, 2008)

3.2 What are the typical sales methods/contract types/marketing channels in the region?

3.2.1 Description of the sales methods/contract types/marketing channels in the region

The forest owners who want to take out any profit from their forest establish contact with operators to test if any type of harvesting can be realized there. (Rovira 03/12/2009; Pujol
20/11/2009) The forest operator studies the case, if the industry requires this product and if it is profitable do the performance. In most of the cases, the forest operator does all the paper work (Riera 30/11/2009), if the forest owner does not do it by himself.

There are cases in which the forest operator searches for the owner of a forest where commercial fellings can be performed (Riera 30/11/2009; Palomé 04/12/2009).

The current trend is that private forestlands with PTGMF and subsidized forest stands, are the ones where forest harvests take place. In many cases the subsidies are also used to realize silvicultural treatments by forest operators which also perform integral management (Famadas 01/12/2009).

Regarding forest and industry, the relationship is dual. The forest operator searches the industry or the industry the forest operator (Riera 30/11/2009; Palomé 04/12/2009). In some cases it is the industry directly which searches for the forest owner (Serradora Boix 10/12/2009).

Usually the agreements are verbal (Riera 30/11/2009) both with the industry and the owner, and these usually represent 80% of the agreements, since in the majority of cases the links forest owner – forest operator – industry are ancient and they know each other well (Famadas 01/12/2009). At the contrary, sawmills operate with written agreements (Serradora Boix 10/12/2009).

In the case of the forest owners associations driven by the Provincial Council (Diputació) of Barcelona, the technicians and managers help with the commercialization and sale of the products taken out of the associated forests (Angel & Minguell 04/12/2009).

Something different occurs in public forests, in which wood is sold by public tender. The administration offers a forest to those who want to harvest in it, fulfilling the limitations and obligations that the administration commands. In these cases the agreements are written.

*Contracts can be written or verbal

3.2.2 Description of the importance of these sales methods/contract types/marketing channels in the region (percentage of sales methods of total sales).

There are no data about the sort of agreement and the sales methods because in most of the cases, the agreement is verbal (Riera 30/11/2009; Famadas 01/12/2009).

But according to FG-2, it is not the sales methods the main limiting factor, but the demand.
3.2.3 Sales methods/contract types/marketing channels by assortments (percentage of sales methods of total assortment sales)

There are no data.

3.2.4 Importance of sales methods/contract types/marketing channels by ownership category (percentage of sales methods of total sales by ownership category)

As it happens in 2.1.2, there is no data. This has importance, because with verbal agreements, short term trades are made and they are therefore easy to accomplish. Many forest operators would prefer written agreements and in longer terms because in this way they can ensure their work and optimize investments (Famadas 01/12/2009; Palomé 04/12/2009).

Regarding the property type, if small then it is difficult to agree with any operator because of the low profitability. In larger areas the balance can be positive and the agreements easier to reach and meet (Riera 30/11/2009).

3.2.5 Explanation why categories of fragmented private forest owners prefer some sales methods/contract types/marketing channels over others that are not/hardly used

Cf. 2.2.1

3.2.6 Indication of the development of sales methods/contract types/marketing channels and explanation of any significant changes over the last approx. 10 years, as well as ongoing trends

As explained in 3.1.1.6 and 2.2.1, there is currently a change in the trading relationships. The forest operators are evolving towards forestry service companies, performing any forest or environmental operation, such as consultancies, silvicultural treatments and others, including forest harvests.

Furthermore, the industry broadens its activity, performing by itself the forest operations (Serradora Boix 10/12/2009)

3.3 How are the wood sellers and buyers to be characterised?

3.3.1 Characterisation of the forest owner’s side

3.3.1.1 The share of “organised” and “un-organised” forest owners

There is no data available regarding the number of organized and not organized owners of the whole region of Catalonia however, there are data with regard to the Catalan Federation of Associations of Forest Owners (BOSCAT\(^{14}\)) which represents 610 owners, mainly from the province of Barcelona. Another entity to be taken into account is the Consortium Forestal of Catalonia (CFC\(^{15}\)), which has 1,200 owners. Both together account roughly for 1,800 owners – it is not a total sum since some owners of Boscat belong to the Consortium- (personal communication with Josep Rius, vocal of BOSCAT). This approximate figure represents 52.6%

\(^{14}\) http://www.boscat.cat/

\(^{15}\) http://www.forestal.cat
of the registered owners, who are 3,440 (CPF 2008). But if compared with the 174,775 owners of forestlands (Llongarriu 2006), organized owners represent only 1% of the total.

It must be taken into account too that many forest properties belong to non-forest owners (Vilalta 30/12/2009), or to agrarian owners that have forestland as a complement (Rovira 03/12/2009). There are agrarian unions such as the Union of Farmers, Young Agriculturalists and Graziers of Catalonia and Association of Young Agriculturalists, which represent a big number of agrarian owners, many of them also owning a forestland (Vilalta 30/12/2009).

3.3.1.2 The share of wood sales by “organised” and “unorganised” forest owners by assortment and/or buyer category

There is no data available, but in year 2007 153,412 tones of roundwood and 61,179 t of fuelwood were extracted from properties adhered to CPF. This represents, with regard to 2007 total harvest (section 2.2.3), 74% of the total harvests. This indicates that most of the harvests are performed in registered owner’s forestlands, more than 50% of which are associated.

It must be emphasized that the forest properties with a document management, representing about 440.983 ha of forests on the entire region. Of this area, over 99% are forest owners who are over 25 ha (CPF, 2009).

3.3.1.3 Explanation of the types of organised forest owners associations in the region

There is little tendency to forest associations (FG-1; FG-2), mainly because a lack of knowledge of its possibilities (Angel & Minguell 04/12/2009), as well as a lack of cooperative work trend (FG-2). Some associations are:

- Forestry Consortium of Catalonia - Consorci Forestal de Catalunya
- Catalan Federation of Associations of forest owners - Federació Catalana d’Associacions de Propietaris Forestals
- Farmers union - Unió de Pagesos
- Association of young farmers - Associació de joves agricultors
- Young farmers and livestock in Catalonia - Joves agricultors i ramaders de Catalunya
- Agrupacions de defensa forestal
- Forest Ownership Center.

The figure of the CPF has been mentioned before and it will be described in 5.1.2.

3.3.1.4 Description of how these associations work

Consorci Forestal de Catalunya: private association created by forest owners of Catalonia in 1948, having as a main objective to safeguard the interests of private owners and the forest sector in general. The first Forest Cooperative has been created within, and also a guide of the forest sector and a Biomass Observatory

Federació Catalana d’Associacions de Propietaris Forestals: federation created from 14 forest owner associations from Barcelona province. It has been created under the supervision of Diputació de Barcelona. The associations that are:

16 Forest Ownership Center (see section 5.1.2.)
• Bages Anoia
• Bages Vallès i Valls Montcau
• Baix Llobregat
• Berguedà verd
• Boscos del Bages nord
• Entorns de Montserrat
• Lluçanès
• Montnegre-Corredor
• Premià de dalt
• Rebrot
• Serra de Bellmunt
• Serra de Rubió
• Serralada Prelitoral del Penedès
• Tres Castells

In Figure 8 it is shown their territorial distribution:

![Forest owners associations belonging to the Federació d'Associacions de Propietaris Forestals](image)

**Figure 8**: Forest owners associations belonging to the Federació d'Associacions de Propietaris Forestals

**Agrarian syndicates**: *Unió de Pagesos, Associació de joves agricultors* and *Joves agricultors i ramaders de Catalunya*. They are syndicates with the aim to defend the interests of their farmers, giving information and support to those owning forestlands.

**Agrupacions de defensa forestal**: Forest Defense Associations: they are groups organized with the aim to prevent and extinct forest fires. They have a 20% minimum participation of forest ownership.

**Forest Ownership Center (CPF)**: it is not an association but an institution that belongs to the Forest Public Administration (see section 5.1.2.).

### 3.3.1.5 Indication of the future development of the degree/level of organisation of forest owners

The trend is an increase on the number of partners, because the experiences of the forest owners associations of the Barcelona province as well as the work that performs the Consortium are very positive and help to dynamize to forest owner (FG-1).

There are more and more properties which adhere to the Forest Ownership Center (Graphic 8).
In 1991, there was a forest area of 180.2 ha with a Management Plan approved, and in 2008 this figure was 438,416.3 ha (CPF 2009).

The increasing number of owners implementing management plans is due to the benefits (section 2.6.3) that provides, (PTGMF, PSGMF), lesser bureaucracy, greater control and improvement in management of forest activities.

With regard to the associations of forest owners of Diputació de Barcelona, forest owner subscriptions are increasing too. There are a range of benefits, such as technical management performed by public administration, silvicultural treatment and improvement works with subsidies that are very attractive to the owner. Moreover, the owner has the freedom to leave the association when he/she wants without any commitment (FG-1).

But the degree of organisation of forest owners will depend on the existent and emergent markets (such as the biomass market), which give the forest owner good expectations (Riera 30/11/2009). This process presents however some difficulties because many owners perceive their properties as an unique and untransferable thing, where only he/she can go in. There is a lack of collective sense (Vilalta 30/12/2009).

Regarding the use of forest biomass as energy, it is a kind of fashion, but there are not enough-decisive projects to secure this sector (FG-1; FG-2).

As an example,...“in a zone of Tarragona (south of Catalonia) a lot of owners have fields of hazels and till lately each worked on its own with his/her tractor. Now the tractor stays in the garage because it is not profitable. Now they are starting to think about working jointly, but who will put the tractor? Who will pay in case of failure of the machinery? Etc., There
appear so many personal cons, that at the end it’s better to give it up”... (Vilalta 30/12/2009)

3.3.1.6 Is there a trend towards increased cooperation between small/fragmented private forest owners?

As commented in the section 3.3.1.5, the associative phenomenon is increasing, but its evolution depends a lot on the mind and psychology of the owners (Vilalta 30/12/2009; Riera 30/11/2009). However there are other variables to add such as uneven-aged forests and the presence of different types of forests among different owners (Riera 30/11/2009), which results in difficulties to share the costs among owners (Jané 30/11/2009).

As there is an increasing number of forest owners who understand cooperation as a way to obtain benefits, there is a parallel increase in the number of forest associations registrations.

3.3.2 Characterisation of the wood industry side

3.3.2.1 The share of “organised” and “unorganised” industrial buyers

There are 39 companies adhered to the Association of Forest Harvesters and Sawmillers (Associació de Rematants i Serradors de Catalunya17, ARESCAT), which include forest operators and first-stage process industries. It is difficult to quantify the percentage that are organized since many of the companies that perform forest operations have disappeared or evolved giving other services. As an overview (with respect to industrial buyers and first stage process) it could be stated that 60-70% are organized, which is a high percentage in comparison to the forest owners.

3.3.2.2 The share of wood bought by “organised” and “unorganised” industrial buyers

Taking into account that the important sawmills are in ARESCAT consuming round 600,000 m3 (Serradora Boix 10/12/2009) meaning that it consumes 85% of the timber that produces Catalonia, then total production is about 750,000 m3

3.3.2.3 The types of organised industry associations (cooperatives, co-operations, unions)

Association of Forest harvesters and Sawmillers (Associació de Rematants i Serradors de Catalunya, ARESCAT): sectorial organization, which associates, coordinates and represents forest harvesting enterprises and first-stage processing industries. This association belongs to the Catalan Wood Federation (Federació Catalana de la Fusta18), which covers all the industries related to the wood: furniture, carpenters, sawmills of second processing, etc.

3.3.2.4 how do these associations work (by type of organisation)? Legal set-up, activities (including, but also beyond timber procurement), who initiated them and why? Are they linked to special sales methods?

Idem 3.3.2.3.

3.3.2.5 How is the degree/level of organization of industrial buyers expected to develop in future?

Is maintained as this.

17 http://www.minorisa.es/gr-serradors/catala.htm
18 http://www.fustacat.com/
3.3.3 Cross forest owners and wood industry associations

3.3.3.1 The share of forest owners (by owner type) and industrial buyers (by buyer type) in cross forestry-industry associations

This figure of an association between owners and industry does not exist as such, although there can be agreements between industrial and forest owners for wood trading (Serradora Boix 10/12/2009).

Yet, in the region there is the Taula Intersectorial Forestal. Institution where the professional organizations related to the sector are represented and, by means of their associations, the forest owners, public and private, the forest companies, the industries of wood and forest products processing, the industries that use in their products direct or indirect derivatives of forest productions, and those that produce machinery and equipment for forest works.

The functions are:

a) Take part in the elaboration of forest policy
b) Contribute to catalogue, normalize and standardize forest products, machinery and equipment.
c) Coordinate forest sector yield forecasts with the industrial needs.
d) Propose lines of promotion, improvement and experimentation in the forest sector and in the derivative industries.

3.3.3.2 The share of wood sold/bought by cross forestry-industry associations

Idem.

3.3.3.3 Operating principles of these cross forestry-industry associations

Idem.

3.3.3.4 Is there a trend towards a more vertical cooperation or integration which involves also small owners?

The interviews show that, when the industries are in search of forest owners in order to harvest wood, they may proceed to harvest it into small owner properties only if it is profitable for them and the properties are located near the industry exploitation. (Serradora Boix 10/12/2009).

3.4 What is the general atmosphere of the relationship between forest owners especially fragmented private forest ownerships and the industry?

It is a purely commercial relationship, and if profitable, the relationship will be good (Serradora Boix 10/12/2009). But if the owner does not come from forest tradition and devotes to another economic activity (Alraras 01/12/2009), he/she could not let to do the harvests because of a conservationist viewpoint (Jané 20/11/2009). The execution of a forest operation can generate opposed opinions from the perspective of owners because of social or conservationist questions (Angel & Minguell 04/12/2009).

Due to low profitability of wood (Famadas 01/12/2009) and the abandonment of land in many cases by small owners, (Vilalta 30/12/2009), this commercial relationship is likely to be absent.
3.5 How do wood prices and wood price changes influence the regional supply?

3.5.1 In context to forest ownership structure? Describe different reactions by ownership category and assortments

When the price is higher than 35 €/t (for pulp or panels) the forest owner or the forest operator are prone to perform the operations (FG-2), either for large or small properties. Any harvest is dependent on the wood price (Pujol 20/11/2009).

It is important to remind that many owners have economic activities not linked to the forest property (Alfaras 01/12/2009) and therefore negative balances do not affect considerably his/her economy, but an increase in the price of wood would facilitate the performance of forest works (FG-2).

3.5.2 Price developments during the last approx. 10 years

In the last years wood price has been decreasing, particularly in the beginning of the crisis and due to some recent storms. After these storms, public administrations reacted subsidizing the withdrawal of fallen trees, which facilitated the performance of improvement works but also drove wood at very low prices.

Table 18: Price developments for different assortments €/m³ (Source: Taula de Preus de la Fusta de Vic ; updated to 2008 prices)

<table>
<thead>
<tr>
<th>Year</th>
<th>Saw wood</th>
<th>Fuelwood</th>
<th>Trituration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>68</td>
<td>59</td>
<td>40</td>
</tr>
<tr>
<td>1994</td>
<td>69</td>
<td>69</td>
<td>37</td>
</tr>
<tr>
<td>1995</td>
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<td>66</td>
<td>38</td>
</tr>
<tr>
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<td>72</td>
<td>63</td>
<td>32</td>
</tr>
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<td>1997</td>
<td>71</td>
<td>63</td>
<td>32</td>
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</tr>
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</tr>
<tr>
<td>2008</td>
<td>56</td>
<td>42</td>
<td>26</td>
</tr>
</tbody>
</table>
As a general rule, price trend is decreasing. A comparison of average price of wood sells from 2001 until 2006 (Graphic 10) shows a parallel fall on the prices and an increase in the volume of harvested wood, although prices are lower.

As a general rule, price trend is decreasing. A comparison of average price of wood sells from 2001 until 2006 (Graphic 10) shows a parallel fall on the prices and an increase in the volume of harvested wood, although prices are lower.
3.5.3 Wood supply price elasticity’s by ownership categories and/or assortments

For elasticity analysis, it has been taken into account values of selling volumes and price variability for fuelwood and roundwood, from 2001 to 2006 The used formula has been that of Hernández (200919).

\[ \varepsilon = \frac{\Delta Q / Q}{\Delta P / P} \]

Q=Selling volume
P=Product price

Having a look at the sales and price development (Graphic 11), price decrease does not generate a decreasing offer of wood. It seems to be due to public subsidies for sustainable forest management and natural disasters (forest fires, wind and snow storms, etc.)

So there is no detected elasticity for price and offer.

3.6 What is the role of forest authorities regarding fragmented private forest ownerships participation in the wood markets concerning guidance & control on harvests and wood sales, forest management & wood trading regulations and wood-related taxes & subsidies?

3.6.1 Guidance and control on harvests of fragmented private ownerships

According to Catalan forest law, forest harvesting operations and silvicultural treatments require one specific authorization from the Department of Environment and Housing. In these authorizations technical conditions for operations are established. Exceptionally, in case of major force or natural disasters this procedure can be eased. Once authorized, forest administrations control the execution of the activities (Garolera 30/11/2009; Riera 30/11/2009).

If there is a management planning document in force, authorizations are not needed. In this case, it is only required a communication in the beginning of the operations. A technician of the Forest Ownership Center ensures that operations are executed as described in the management plan. In 2008, only 30% of the forest area had a management plan, however most of the planned operations have not been executed due to lack of resources for investment (CPF).

In some cases, there are more public administrations involved in the authorization process regarding forest operations and silvicultural treatments. This is the case of natural parks, where it is also required an authorization from the technicians of these entities (Garolera 30/11/2009).

It seems an easy procedure, but it may take several months from the request of the authorization to the execution of the forest operation, (in case of no management plan). Then the opportunity for a harvesting operation may also be lost. If administrative

procedures lasts so long, final resolution can be delayed one year having consequences in the profitability of the harvests or adding many technical requirements in the authorization (Jané 20/11/2009, FG-1).

3.6.2 Guidance and control on wood sales of fragmented private ownerships

There is no data of this control on the wood sales.

3.6.3 Forest regulations

The main applicable forest regulations are the national forest law (Ley de montes 43/2003) and the Catalonia forest law (Llei 6/1998). Both laws detail the need of approving a management plan or other planning or dasocratic instrument in order to perform harvest operations. If these conditions are not fulfilled, it is required to proceed according to section 2.6.1.

In the case of small fragmented properties it is applicable the Plans Simples de Gestió (PSGMF), which is a management and planning document destined to forest properties with less than 25 hectares of surface. With the approval of the plan the forest owner has the following rights:

- Exemption of permissions for the performance of works and harvests.
- Fiscal reductions in the personal income tax and in the tax of inheritance, donations and documented judicial acts.
- Reduction in the tariffs of the property registry and notaries.
- Access to insurance against forest fires and to one of civil responsibility.
- Access to the economic aids of the DMAiH
- Information access to forest taxation.

3.6.4 Wood trading regulations

To be able to trade with wood, after the performance of the works, the companies acting must be accredited as first-stage processing industry (Law 6/1988) by means of a document of entrepreneurial qualification that provides the DMAiH.

For the transport of wood exist the norm of load limitation. The load cannot exceed 26 t, including the tare of the truck. According to the normative, the maximum load for each axis is 9,5 t, for the transport of goods. But the forest trucks differ from the normal trucks on a greater robustness and hardness, which weight more, but also have greater load capacity. Since this type of trucks are under the general rule, the legal maximum load is less than the capacity to transport (Serradora Boix 10/12/2009).

3.6.5 Forest or wood related taxes

There are no taxes or direct taxes to the wood, with the exception of common indirect taxes as the corporation tax, social security, income tax, and other related.

3.6.6 Forest or wood related subsidies

From the competent forest public administration, there are annual subsidies/grants to promote the mobilization of wood, maintenance of jobs, carrying out forest fire prevention tasks, repair of disasters, and other goals prioritized in the region. Calls in 2008 included:

- Subsidies for hiring forest property insurance
- Subsidies for recovering and removing fallen wood from wind storms and snow
- Subsidies to promote activities of the Forest Defense Groups (ADF’s) and their federations
- Subsidies for sustainable forest management in private forest properties, and for removing fallen wood by snowfall, drought or wind storms
- Subsidies for sustainable forest management in private forest properties
- Program of forest restoration and improvement of the Barcelona Province Council, to promote forest planning and management.
- Subsidies for economic diversification of rural areas in Catalonia, Leader program
- Subsidies for forestry operations located in the Natural Parks managed by the Barcelona Provincial Council
- Support for elaboration and modification of management plans on privately owned properties
- Line for the improvement of competitiveness of wood and furniture manufacturing sector. By the Institute of Crédito Oficial (ICO). Investment in production machinery, building enlargement, etc.
- Subsidies to support transport and stock regulation for primary processing industries, due to emergencies of wind storms and snow.

3.7 What is the role of stakeholders with interests in forestry (e.g. chambers of agriculture and forestry, forestry NGOs, environmental NGOs) concerning barriers and support in:

3.7.1 The role stakeholders with interest in harvest activities of fragmented private forest ownerships?

Apart from the players involved in the market (forest operators, industry, forest owners and administration), in Catalonia there are not too many figures involved in forest management and wood transport. However, certain groups outside the forestry work (Angel Minguell 04/12/2009) have a negative image of forestry (Alfaras 01/12/2009). These groups directly or indirectly influence the society by giving a conservationist perception (Rovira 03/12/2009).

This conservationist message makes that some owners feel the productive focus as inappropriate (Angel Minguell 04/12/2009).

3.7.2 The role of stakeholders with interest in forestry concerning wood sales of fragmented private forest ownerships

According to interviewees, the involved stakeholders are the already mentioned (section 2.2.1, 2.7.1). Intermediaries may appear sporadically bringing wood from the rest of Spain (Famadas 01/12/2009), and even some Catalan companies export to other countries, particularly forest chip to Italy (Pujol 20/11/2009).

3.7.3 The role of stakeholders with interest in forestry concerning the overall framework conditions related to harvests & wood sales of fragmented private forest ownerships

Industry of first transformation of wood are the first ones interested in forest operation performances, because their raw material comes from forests (Jane 20/11/2009). For them
is not important if the material comes from fragmented or not forest ownerships, the only condition is the profitability (Boix Sawmill 10/12/2009).

Other actors involved, belonging or linked to public administration:

As a decentralized entity of the Department of the Environment and Housing was established the Forest Ownership Center (see section 5.1.2). Its main objectives are to organize forest production and to promote conservation and improvement of forests and grasslands in private ownership. This entity integrates private forest owners and associations. Support for management plans and forest management is given to these participants.

Also from the Barcelona Province Council, owners associations are promoted and a forest technician support is provided for the promotion and management of forest operations, as well as support for wood marketing actions.

Also coming from the administration side a forest sectorial table has been created (cf. 3.3.3.1.).

### 3.8 How are the wood markets in the region most likely to develop in the future?

#### 3.8.1 The expected development of prices (by assortments) and reasons for changes

The expected evolution of prices is to continue downward for at least next year, due to importing of sawn wood from other countries, cheaper than the local one (Famadas 01/12/2009). Anyway, in recent years prices of imported products are increasing due to costs of transport and manufacture, and this is again promoting the local timber (Jane 20/11/2009).

Some interviewees claim that the development of forest biomass as energy resource can increase the price of wood (Pujol 20/11/2009, 30/11/2009 Riera; Rovira 03/12/2009; Alfaras 01/12/2009), and expect increasing demand not only in volume but also in buyers number (FG-1). Anyway, these are speculations, because no big bioenergy project is in a mature phase of execution (Rovira 03/12/2009).

#### 3.8.2 The expected development of wood supply (by assortments) and reasons for changes

There is some divergence about this trend: some interviewees expect an increase due to forest biomass as an energy resource (FG-1); others are more sceptical, because of lack of a quality product, high operating costs, low prices and heavy administrative processes (FG-2).

#### 3.8.3 The expected development of demand (by assortments) and reasons for changes

The products of Catalan sawmill industry are mainly particle board and pallets (or other packing products), products with low added value. If there is no development of higher added value products, demand will keep as now or will decrease (FG-2).

As previously mentioned in section 2.8.2, if there is some development of forest bioenergy, current conditions of wood harvesting and selling may improve (FG-1). It's indicated to

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promote heating facilities of 500 kW to 1MW in municipalities and industries (Famadas 01/12/2009).

On the contrary, by the industrial side an increase of the demand is perceived as difficult, because lack of offer due to lack of forest management, activities and capacity (Jane 20/11/2009).

3.8.4 The expected development of the market’s structure and reasons for changes

Increasingly, forest operators are dedicated to carrying out other tasks that are not purely forestry (FG-1). There is an expected decrease in the number of forest owners available to sell wood, because an increase in the abandonment of forest activity (Famadas 01/12/2009; Angel Minguell 04/12/2009; Alfaras 01/12/2009). It’s also foreseen the closing down of some small industries and a similar level of demand volumes due to possible enlargement of the biggest industries (Boix Sawmill 10/12/2009).

3.8.5 The expected development of wood imports

Decrease in imports due to increasing costs of exporting countries (Jane 20/11/2009). Anyway, because of the lack of innovation and optimization of resources in the forest companies and industry (Famadas 01/12/2009), there is a weak potential for competition against foreign products.

3.8.6 The expected development of exports

Nowadays Catalonia is exporting to other countries, but this exported wood is not associated with local precedence: it can –and it’s expected to be- from imported products(FG-1). There are real exports of wood chips from Catalonia to Italy for bioenergy purposes (Pujol 20/11/2009).

Future is foreseen in a not optimistic way if there is not an increase in the development of wood products from local wood (FG-2).

3.8.7 The expected development of forest authorities and interest representations

Public administration is considered to play an important role, giving support and investing on demand improvement (FG-2), because the forest sector does not feel to be enough supported by competent administrations (Garolera 30/11/2009; Famadas 01/12/2009).

Technological innovation and research, market structures improvement, dissemination and promotion of local forest products, are some of the measures where public administrations, forest owners associations and industry are expected to be participating (FG-1; FG-2)

Other important stakeholders are local entities (personal communication, E. Plana). These entities could sell forest products as a whole, including forest externalities, non-wood products and all wood products (including firewood and roundwood).

3.9 What other factors may be important to describe the wood markets relating to the harvest level/mobilisation and fragmented forest ownership?

There are other important factors in wood mobilisation, as is the loss of harvesting professionals and lack of forestry knowledge. This is an important point; there is a
decreasing number of people involved in forestry and harvesting activities, on a experienced and profitable way (FG-1).

Other factors are beliefs and vision of the whole society regarding forest management and forest harvesting. It is really important to disseminate the importance of forest activity for rural activity and for forest fire prevention (FG-1, FG-2) and to increase awareness of these aspects.
4 Forest Owners

4.1 Description of the structure of forest ownership in the area in terms of forest resources

4.1.1 Indication of the overall distribution of ownership categories, the share of private ownership, the share of fragmented private forest ownership, and its development

4.1.1.1 The overall distribution of ownership categories in terms of forest land in hectare

Cf. 3.1.1.1. by the division of forests according to ownership and management.

With respect to the surfaces, there are diverse sources with diverse values which are somehow similar. In Table 19 is shown a collection of values with their respective source.

Table 19: Summary data on surface

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest &amp; other wooded land</td>
<td>1,938,601</td>
<td>2,038,037</td>
<td>1,961,855</td>
<td>1,938,281</td>
<td>1,930,482</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>60.60</td>
<td>63.51</td>
<td>61.55</td>
<td>60.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forests</td>
<td>1,214,615</td>
<td>1,231,006</td>
<td>1,332,994</td>
<td>1,214,664</td>
<td>1,626,212</td>
<td>1,373,415*</td>
</tr>
<tr>
<td>Private forest land</td>
<td></td>
<td></td>
<td>1,512,758</td>
<td></td>
<td>1,196,862</td>
<td></td>
</tr>
<tr>
<td>Public forest land</td>
<td></td>
<td>449,097</td>
<td></td>
<td></td>
<td>176,553</td>
<td></td>
</tr>
</tbody>
</table>

* It is not specified if shrubs are or are not included

In Graphic 12 is shown the disaggregation of the public areas in Catalonia.

Graphic 12: Public area distribution in Catalonian forests (a-Departament de medi ambient; b Diputacions; c Patronats)

The spatial distribution of the private forest lands is shown in Figure 9, according to data from SIGMAP.
4.1.1.2 **The share of private forest ownership**

About 87% of the forest cover of Catalonia is owned by private owners (SIGMAP), (c.f. 2.1.1.). According to SIGPAC, forest areas in Catalonia totalize 1,373,415 ha, where 1,196,862 ha are private lands.

CPF presents slightly different figures, where the total forest area is 1,961,855 ha and 1,512,758 ha are privately owned (77%).

There are about 174,775 private owners in Catalonia (Llongarriu, 2006) (cf. 3.1.1.1), owning 1,196,861.86 ha (SIGPAC). Thus, the average area per ownership is 6.84 ha. Thus, each owner has more than two forest stands as a general rule (average size per property is 2.71 ha; cf. 4.1.1.3.).

**Table 20: Number of owners according to property size in Catalonia**

<table>
<thead>
<tr>
<th>Area</th>
<th>Number of owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.5</td>
<td>62,405</td>
</tr>
<tr>
<td>0.5 - 1</td>
<td>26,298</td>
</tr>
<tr>
<td>1.1 - 5</td>
<td>53,869</td>
</tr>
<tr>
<td>5.1 - 10</td>
<td>13,405</td>
</tr>
<tr>
<td>10.1 - 25</td>
<td>9,415</td>
</tr>
<tr>
<td>25.1 - 50 ha</td>
<td>3,859</td>
</tr>
<tr>
<td>50.1 - 100 ha</td>
<td>2,598</td>
</tr>
<tr>
<td>100.1 - 350 ha</td>
<td>2,302</td>
</tr>
<tr>
<td>350.1 - 750 ha</td>
<td>393</td>
</tr>
<tr>
<td>&gt;750 ha</td>
<td>231</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>174,775</strong></td>
</tr>
</tbody>
</table>
4.1.1.3 The share of fragmented forest ownership thereof

89% of the owners have properties with less than 10 ha, representing 31.22% out of the total private forest land (see 2.1.1, page 6) in the region (SIGPAC, 2009).

Table 21: Owner numbers and area covered according to property size in fragmented private ownership in Catalonia

<table>
<thead>
<tr>
<th>Area</th>
<th>Number owners</th>
<th>Share of private forest owners</th>
<th>Forest land (ha)</th>
<th>Share of area</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.5 ha</td>
<td>62,405</td>
<td>35.71%</td>
<td>42,398</td>
<td>3.54%</td>
</tr>
<tr>
<td>0.5-1 ha</td>
<td>26,298</td>
<td>15.05%</td>
<td>44,078</td>
<td>3.68%</td>
</tr>
<tr>
<td>1.1-5 ha</td>
<td>53,869</td>
<td>30.82%</td>
<td>178,982</td>
<td>14.95%</td>
</tr>
<tr>
<td>5.1-10 ha</td>
<td>13,405</td>
<td>7.67%</td>
<td>108,233</td>
<td>9.04%</td>
</tr>
<tr>
<td>Total</td>
<td>155,977</td>
<td>89.24%</td>
<td>373,693</td>
<td>31.22%</td>
</tr>
</tbody>
</table>

About 265,500 ha are properties under 5 ha.

Private forest fragmented ownership is in major part in the south and south-west of Catalonia, with an average of more than 400 forest owners per municipality. However, some of these owners own more than one property but in different municipalities.

Figure 10: Number owners/town and surface of private forest stands
Maximum share of coverage and number of fragmented properties takes place in Tarragona, while absolute maximum in area with fragmented ownerships takes place in Barcelona.

Table 22: Forest ownership size by provinces (SIGPAC, 2009)

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total private forest (ha)</th>
<th>Number of properties</th>
<th>ha/property</th>
<th>Max, Parcel size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lleida</td>
<td>347,540.56</td>
<td>123,974</td>
<td>2.80</td>
<td>1,438.84</td>
</tr>
<tr>
<td>Girona</td>
<td>322,729.63</td>
<td>95,625</td>
<td>3.37</td>
<td>873.13</td>
</tr>
<tr>
<td>Barcelona</td>
<td>402,581.74</td>
<td>117,408</td>
<td>3.43</td>
<td>690.72</td>
</tr>
<tr>
<td>Tarragona</td>
<td>124,009.93</td>
<td>100,054</td>
<td>1.24</td>
<td>962.12</td>
</tr>
<tr>
<td>Total</td>
<td>1,196,861.86</td>
<td>437,061</td>
<td>2.71</td>
<td>1,438.84</td>
</tr>
</tbody>
</table>

4.1.1.4 Indication of the development and explanation of any significant changes over the last approx. 10 years, as well as ongoing trends

Only some economical obligations for the owners, as i.e. (CPF):21

- Forest properties transfer: it is necessary to pay the VAT and a tax for inheritance and donations (ISD: Impost de successions i donacions).
- Real estate tax (IBI: Impost de béns immobles)
- Individual income tax (IRPF: Impost sobre la renda de les persones físiques)
- Companies tax (hardly ever imposed to forestry activities, because of the variability of forest harvestings)

However, there are other processes as i.e. private forest properties purchased by public administration, forested land abandonment (FG-1, Vilalta 30/12/2009), properties segregation (Garolera 30/11/2009), land use changes and property acquisition by non-forest-owners (Alfaras 01/12/2009).

Although not a restitution process, some changes in forest ownership can be mentioned:

- When public administration is purchasing forest properties (Riera 30/11/2009): public administration contacts the owner and acquires the property. It is not a widespread process. This only happens in some protected or natural interest areas, where public administration wants to ensure the ecosystems to be untouched.
- Properties segregation (Garolera 30/11/2009; Alfaras 01/12/2009): Some segregation process is happening in the peri-urban areas. Some properties are sold to new owners in order to build 2nd residences or other uses i.e. leisure.
- Ownership abandonment (Vilalta 30/12/2009): A common reason for forest management and harvesting abandonment is low profitability of forest, ranching and agriculture activities.
- Land use change (Garolera 30/11/2009; Alfaras 01/12/2009; Riera 30/11/2009; FG-1): Sometimes forest ownership, coming from agroforestry tradition becomes businessman/woman of tertiary sector. This mainly happens near urban areas or around touristic places.

The perspective of the evolution of the forest ownership is linked to the heritage (CFC-CTFC, 2003) and its profitability (Riera 30/11/2009). The forest owner linked to the land through heritage will manage the land although the little or absent profitability (CFC-CTFC,2003). When linked to the profitability, the property will be sold or no operations will be performed if management supposes a problem (Garolera 30/11/2009). It is in general

21 [http://mediambient.gencat.net/cat/cpf/fiscalitat/](http://mediambient.gencat.net/cat/cpf/fiscalitat/)
perceived that the evolution is tending towards abandonment and land use change (from primary to tertiary).

4.1.2 Indication of ownership size categories within the group of fragmented private forest owners, and its development

4.1.2.1 Indication of the distribution of ownership size categories within the group of fragmented private forest owners (number of owners and size of forest land by category)

50.76% of the owners have an area of less than 1 ha, which represents only 7.22% of the forest area.

Table 23: Distribution of ownership

<table>
<thead>
<tr>
<th>Area</th>
<th>Number</th>
<th>Owners [%]</th>
<th>Accumulated owners [%]</th>
<th>Number of parcels</th>
<th>Share parcels [%]</th>
<th>Area representation (ha)</th>
<th>Area [%]</th>
<th>Accumulated area [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.5 ha</td>
<td>62,405</td>
<td>35.7%</td>
<td>35.7%</td>
<td>254,697</td>
<td>58.25%</td>
<td>42,399</td>
<td>3.54%</td>
<td>3.54%</td>
</tr>
<tr>
<td>0.5-1 ha</td>
<td>26,298</td>
<td>15.0%</td>
<td>50.8%</td>
<td>62,284</td>
<td>14.24%</td>
<td>44,079</td>
<td>3.68%</td>
<td>7.23%</td>
</tr>
<tr>
<td>1.1-5 ha</td>
<td>53,869</td>
<td>30.8%</td>
<td>81.6%</td>
<td>83,541</td>
<td>19.10%</td>
<td>178,982</td>
<td>14.95%</td>
<td>22.18%</td>
</tr>
<tr>
<td>5.1-10 ha</td>
<td>13,405</td>
<td>7.7%</td>
<td>89.2%</td>
<td>15,454</td>
<td>3.53%</td>
<td>108,233</td>
<td>9.04%</td>
<td>31.22%</td>
</tr>
<tr>
<td>10.1-25 ha</td>
<td>9,415</td>
<td>5.4%</td>
<td>94.6%</td>
<td>11,993</td>
<td>2.74%</td>
<td>186,999</td>
<td>15.62%</td>
<td>46.85%</td>
</tr>
<tr>
<td>25.1-50 ha</td>
<td>3,859</td>
<td>2.2%</td>
<td>96.8%</td>
<td>5,211</td>
<td>1.19%</td>
<td>181,829</td>
<td>15.19%</td>
<td>62.04%</td>
</tr>
<tr>
<td>50.1-100 ha</td>
<td>2,598</td>
<td>1.5%</td>
<td>98.3%</td>
<td>2,654</td>
<td>0.61%</td>
<td>181,672</td>
<td>15.18%</td>
<td>77.22%</td>
</tr>
<tr>
<td>100.1-350 ha</td>
<td>2,302</td>
<td>1.3%</td>
<td>99.6%</td>
<td>1,329</td>
<td>0.30%</td>
<td>209,650</td>
<td>17.52%</td>
<td>94.73%</td>
</tr>
<tr>
<td>350.1-750 ha</td>
<td>393</td>
<td>0.2%</td>
<td>99.9%</td>
<td>100</td>
<td>0.02%</td>
<td>50,190</td>
<td>4.19%</td>
<td>98.93%</td>
</tr>
<tr>
<td>&gt;750 ha</td>
<td>231</td>
<td>0.1%</td>
<td>100%</td>
<td>11</td>
<td>0.00%</td>
<td>12,828</td>
<td>1.07%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Total</td>
<td>174,775</td>
<td></td>
<td>437,274</td>
<td></td>
<td></td>
<td>1,196,861</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.1.2.2 Indication of the development and explanation of any significant changes over the last approx. 10 years, as well as ongoing trends

There are no historical data of the evolution of the fragmented forest properties. What is explained in 3.1.1.4 can be considered as an orientative and qualitative approximation.

4.1.3 Indication of the volume of annual increment and annual wood fellings in fragmented private forest ownerships, description of differences between ownership categories within that group, and its development

4.1.3.1 The volume of the annual increment (m³ over bark) in fragmented private forest ownerships

The most productive forest areas of Catalonia are in the central-north and north-eastern parts. These areas match with those with larger properties (> 25 ha). Therefore it can be concluded that fragmented private forest ownership (surface <5 ha) are in the less
productive areas of Catalonia (<1.6 m³.o.b./ha/year) as a general rule, while the average increment of Catalonia is 2.61 m³.o.b./ha/year).

Figure 11: Volume of annual increment in private forest areas (m³.o.b./ha/year)

Table 24: Average volume of annual increment in surfaces under 5 ha in Catalonia (IFN3)

<table>
<thead>
<tr>
<th>Province</th>
<th>Volume of the annual increment (m³ o.b./ha/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barcelona</td>
<td>1.59</td>
</tr>
<tr>
<td>Tarragona</td>
<td>1.02</td>
</tr>
<tr>
<td>Lleida</td>
<td>1.68</td>
</tr>
<tr>
<td>Girona</td>
<td>2.05</td>
</tr>
</tbody>
</table>

4.1.3.2 The annual wood fellings of fragmented private owners (of the last 10 years)

There are no data on cuts made in fragmented private forest surfaces. We could approximate the amount of cuts being made on farms without any sort of figure, comparing data regarding harvest data that have the property cut by the Forest Ownership Center. Cf. 3.1.1.4

Table 25: Average annual wood fellings (m³/year) (DMAIH 2000-2007; CPF 2000-2007)

<table>
<thead>
<tr>
<th></th>
<th>Total coniferous</th>
<th>Total planifolia</th>
<th>Coniferous technical plan</th>
<th>Planifolia technical plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>m³/year</td>
<td>454,911</td>
<td>134,455</td>
<td>116,915</td>
<td>34,161</td>
</tr>
</tbody>
</table>
Approximately 75% of land use are made in private forest estates with technical plans or management plans. Cf. 3.3.1

4.1.3.3 Description of the differences between different ownership size categories within that group of fragmented private forest owners

Cf. 3.1.1.4

4.1.3.4 Indicate the development and explain any significant changes over the last approx. 10 years, as well as ongoing trends.

Cf. 3.1.1.4

4.1.4 Statutory reasons that influence wood mobilisation

4.1.4.1 Description whether, and if so why, significant shares of the annual increment of fragmented private forest owners forestland cannot be mobilised for statutory reasons (e.g. nature protection sites, ban forests etc.)

Cf. 2.4.6.1

4.1.4.2 Indication of the development and explanation of any significant changes over the last approx. 10 years, as well as ongoing trends

Increasingly we are seeing that the rural environment is important for the conservation and maintenance of the landscape (FG-1). However, protected areas have some limitations and restrictions established depriving forestry of timber use.
4.2 What is the level of fragmented private forest owners participation in wood markets?

4.2.1 The main factors that induce or prevent different size categories of fragmented private forest owners to participate in wood markets and its development

4.2.1.1 Description of the main factors that induce or prevent different size categories of fragmented private forest owners to participate in wood markets

When asking about the main factors preventing mobilisation in fragmented private forest areas, many questions arise (Riera 30/11/2009; Palomé 04/12/2009; Rovira 03/12/2009; Garolera 30/11/2009; Famadas 01/12/2009; Alfaras 01/12/2009; Jané 20/11/2009):

- Scarse public subsidies and without continuity (there are changes almost every year).
- Low profitability of the forest.
- High costs.
- Low valuation of the multifunctionality of the forest.
- Lack of added value of manufactured products (main destinations are particle board and packaging
- Pessimistic attitude of forest owners
- Loss & lack of harvesting operators/professionals (main of them are old, often closing the business because of lack of new generation interest)
- Lack of training and experience of harvesting operators/professionals (the younger ones, often do not have any training or experience)
- Long and complicated administrative procedures.

When asking about the main factors inducing mobilisation in fragmented private forest areas, many questions arise (Riera 30/11/2009; Palomé 04/12/2009; Rovira 03/12/2009; Garolera 30/11/2009; Famadas 01/12/2009; Alfaras 01/12/2009):

- If the property provides cash income / economic stimulus.
- Zero cost.
- Feeling romantic and love for the farm or forest.
- Traditional forest owner or community living in typical forest areas.

4.2.1.2 Explanation of the major chains of cause and effect

Currently, most forests fulfill various functions (protection, landscape, recreation, mushroom/chestnuts/pinecones production, timber production) and the owner perceives that society makes use of his property and is not receiving anything in return (Garolera 30/11/2009; Alfaras 01/12/2009). This, together with the low price of wood and the fact that in most cases the wood is not the main income source, owners tend to develop a pessimistic attitude towards their forest or to see it more as a garden (Alfaras 01/12/2009). Therefore there is not an optimal context for forest exploitation. The costs to harvests are not profit margin (Angel & Minguell 04/12/2009; Riera 30/11/2009), and therefore it is necessary to aid the exploitation (Famadas 01/12/2009); adding bureaucracy (Rovira 03/12/2009), which takes to meet the needs of the company for their use (Jane 20/11/2009).
In this context, low profitability of forest and pessimism in the sector, there is increasingly a loss of professionals working in the forest, because working in other sectors can provide more secure and stable income, with the difficult labor conditions in the forest, which for many young people are not attractive (FG-1 FG-2). Linked with this is the forest education which is deficient in Catalonia (FG-1), and emerging as a initiative that wants to resume the trade, but in any specific case.

According to the interviewee another complication, is found in the bureaucracy. Many steps that must desist faith in the execution of the work. Unless you handle another owner (Riera 30/11/2009).

In contrast with traditional forest owners exist, or grew in a forest with asimilat work to be done and forestry activities, see the farm as an economic and productive unit (Garolera 30/11/2009). And many of these have a romantic feeling for nature, for family inheritance, that like the countryside, etc (Rovira 03/12/2009).

4.2.1.3 Expectation regarding an increasing participation of small private forest owners in the wood market in the future

With owners associations, promoted by the Barcelona Provincial Council, is increasing the number of owners partners (FG-1). Mainly there are a number of grants in technical and economical to facilitate the mobilization of wood, roots of past fires (Angel Minguell 04/12/2009). But if there is an established demand, which itself helps these associations, the future expected complicated (FG-1).

Participation is not expected to increase if adjustments are not developed, with increases in demand and increases in the existence of subsidies.

4.3 Characterisation of fragmented private forest owners

4.3.1 Fragmented private forest owners-typologies based on socio-demographic variables, owner’s values, attitudes, objectives and behaviour

4.3.1.1 Description of typologies of fragmented private forest owners that are available for the region and that seem to provide relevant information as regards the effectiveness and efficiency of measures for wood mobilization targeting fragmented private forest owners

According to forest interviews, fragmented private forest ownership can be divided into:

1. Original farmer tradition:
2. Heritage:
3. New acquisition:

In larger properties, there are also other kind of owners. For example the forester (whith a “business” point of view of the property, as a productive unit), or those owners who get the property by heritage and keep it for patrimony.

4.3.1.2 Explanation of how and why the typologies/types are relevant for this project

- Original farmer tradition ownership: farming is their main activity (Vilalta 30/12/2009). Forestry has been historically a complementary activity (Rovira 03/12/2009). They tend to be rural landowners, where their main economic source is linked to the property and they themselves reside on the property (Flat, 2004). The owner understands and acknowledges forest, he/she is more motivated to do things in the
forest stand (Garolera 30/11/2009) and in forestry work. Normally this type of forest owner (rural) is often reported and wants information about the forestry sector.

- **Heritage ownership**: their main economical activity is out of the forest ownership (Angel & Minguell 04/12/2009; Famadas 01/12/2009). There is not a strong link with the property. They can be of rural origin or not. Many times these owners have a goal of maintaining the property, and predominantly if they are of urban residence (Plana, 2004).

- **New acquisition ownership**: their main residence is in the property (Garolera 30/11/2009). They can acquire it for farming or for leisure activities (Alfaras 01/12/2009). In some cases the owner of urban origin (newly acquired) sees the property as a garden or recreational space (Alafaras 01/12/2009), or simply as the residence (Garolera 30/11/2009). Although we must point out that owners of urban origin are perceived as more dynamic and innovative (Rovira 03/12/2009).

However, the vision of the forest owner depends on a personal perception (Garolera 30/11/2009)

4.3.2 The volume of wood potential of fragmented private forest owner-types

4.3.2.1 The volume of wood potential of fragmented private forest owner-types as described in 3.3.1., in terms of previous differences (of the last 10 years) between harvestable annual increment and actual fellings (m³ o.b.)

There are no data.

4.3.3 Characterisation of fragmented private forest owners in the region as regards the following aspects

There are no data records of this characterization of forest ownership.

4.3.3.1 socio-demographic aspects:

- **farm-forest owners vs. non-farm forest ownership** (also distinguish full-time vs. part-time farmers) with or without agricultural/forestry socialisation (e.g. grew up on farm)

The farm-forest owners, as they have grown and lived life on the farm, know the forest and are more motivated to manage the property (Garolera 30/11/2009), but must also take into account that this sector is more conservative (Alfaras 01/12/2009), compared to non-farm forest ownership, which are more dynamic and innovative (Rovira 03/12/2009).

In 2003 a study was conducted on the socioeconomic characteristics of forest ownership in three Catalan provinces. The result was that for 100% of the owners with surfaces under 10ha, the main income source is agriculture. And for these owners the balance of forest-related income is largely deficient (CFC-CTFC, 2003):

<table>
<thead>
<tr>
<th>Forest surface (ha)</th>
<th>Balance income/expenditure (% owners)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>deficient balanced beneficial</td>
</tr>
<tr>
<td>0-5</td>
<td>100 0                           0</td>
</tr>
<tr>
<td>5-10</td>
<td>75  25                           0</td>
</tr>
</tbody>
</table>
Table 27: Characterisation of owner typology according to full-time/part-time farmers

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Full-time, grew up on farm</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>Part-time, may have grown on the farm or not,</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Part-time, not grow on farm</td>
</tr>
</tbody>
</table>

- Living "next door" to their forests vs. absentee/non-resident forest owners (far away from their forests)

The absentee / non-resident forest owners often do not even know where their property stands (especially when very small), and is unaware of or do not have present the management criteria (Alfaras 01/12/2009; Vilalta 30/12/2009).

Table 28: Characterisation of owner typology according to the distance from their forests

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Resident</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>Non resident</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Resident/non resident</td>
</tr>
</tbody>
</table>

- Education in forestry and agriculture - no such educational background

In general, forest owners have some level of knowledge, although limited, thanks to the conferences that the Forestry Consortium of Catalonia organizes every year about silvicultural techniques. Even so, few owners can manage the forest by themselves (Alfaras 01/12/2009).

Table 29: Characterisation of owner typology according education in forestry and agriculture

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Forest and agricultural tradition/education</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>May have forest and agricultural tradition. May have some forestry education</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Low forest and agricultural tradition, may have some forestry education</td>
</tr>
</tbody>
</table>

- Owners' capacities available for forest management: knowledge, machinery, man-power (time available)

Few of them are able to manage the forest themselves or even have their own forest crew, and always thanks to the fact they have large forest properties (Alfaras 01/12/2009).
Table 30: Characterisation of owner typology according to owner’s capacities available for forest management

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Have machinery, knowledge and manpower</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>May have machinery, knowledge and manpower</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Have nothing</td>
</tr>
</tbody>
</table>

- Share of family income derived from forests and derived from agricultural production

For agroforestry owners (who are the majority above the Catalonia central), the forest is a supplement to agricultural income (Rovira 03/12/2009).

Table 31: Characterisation of owner typology according to the share of family income derived from forests

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Income derived from farm, rural activities, forests and other related.</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>Income mainly off-farm, other non-primary economic activities</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Income mainly off-farm, other non-primary economic activities</td>
</tr>
</tbody>
</table>

- Membership in forest owner cooperatives and forest owner interest groups

Thanks to the dissemination tasks implemented by the Federation of Forest Owners and the Barcelona County Council there is an increasing number of associated owners (FG-1).

Table 32: Characterisation of owner typology according to membership in forest owner organisations

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Some belong to any organization, mainly agrarian</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>They may be interested, including joint management</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>May interest</td>
</tr>
</tbody>
</table>

- Sectoral reachability: regular receiver and user of forest sector information (e.g. publications by forest owner organisations, professional journals)

Generally the information is transmitted from person to person (FG-1). The more active usually gets more information (Famadas 01/12/2009).
Table 33: Characterisation of owner typology according sectoral reachability

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>They know the information</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>Some know of the information</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Some know of the information</td>
</tr>
</tbody>
</table>

- Other socio-demographic characteristics relevant as regards wood mobilization?
  The youth who own forest properties do not have interest in searching for information and carry out forestry work in the property (FG-2).

Table 34: Characterisation of owner typology according to other socio-demographic characteristics

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Younger generations have low interest</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>May have interest the issue of mobilising wood</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>May have interest the issue of mobilising wood</td>
</tr>
</tbody>
</table>

- Expected trends of socio-demographic characteristics relevant as regards wood mobilization?
  The forest areas near towns and urban areas have increased pressure for land use change, from primary to residential (Alfaras 01/12/2009).

<table>
<thead>
<tr>
<th>Owner typology</th>
<th>Characterisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original farmer tradition ownership</td>
<td>Reduction of this typology, keeping others acquire more land to optimize (view more business oriented)</td>
</tr>
<tr>
<td>Heritage ownership</td>
<td>Abandonment and sale of the property for low income or high costs</td>
</tr>
<tr>
<td>New acquisition ownership</td>
<td>Increase for the purchase of rural properties and segregation</td>
</tr>
</tbody>
</table>

4.3.3.2 Attitudes towards forests, forest management objectives, forest management behaviour:

- Describe the major attitudes of fragmented private forest ownership towards their forests: e.g. forest as a work place and regular source of income, ownership as family tradition/in heritage, as a form of investment, a reserve for times of need, forest as a habitat/nature/site of nature protection, a site for own recreation, hunting site, etc.

There are at four variables that characterize private forest owners (Dominguez, 2008):

- The family’s patrimony (a moral norm).
- Aesthetic model (how the forest should look like)
- Risk of forest fire (to protect property against forest fire)
- The financial situation of the landowner (implementation of forest management and the rewards gained from the forest can take different forms)

- **Describe guiding management objectives of fragmented private forest ownership:** economic vs. non-economic goals, e.g. to derive maximum income, to reserve growing stock for times in need, to keep to protect nature, to conserve forests for next generation, etc.

The main objectives for which the owner mobilised wood are:

- Economic (income) (FG-1 FG-2; Riera 30/11/2009; Vilalta 30/12/2009).
- Sentimental or equity (considered positive work on the farm) (Garolera 30/11/2009).

There is little management on small or fragmented farms, and in many cases the owner does not even know what the boundaries of the property are (Vilalta 30/12/2009).

In the event that the owner maintains and manages the property, sometimes taken for an ancient tradition (Garolera 30/11/2009)

- **Describe the fragmented private forest ownership attitudes towards forest management service organisations,** such as forest owner cooperatives, harvesting companies, silvicultural services, interest groups, forest authorities (major incentives/pros and barriers/cons to join in or to delegate forest work).

Some owners are conservationists according to family tradition (Rovira 03/12/2009; Garolera 30/11/2009), and this makes difficult to delegate the property to the hands of another company or cooperative, as it is hindered by the fear of loss (FG-1). But other owners, if they see a system of cooperative work, or rely on others to farm, because we make the cost of maintaining the property have it fixed (FG-1).

They usually have a perception of being abandoned by both the administration and its related agencies, and that the forestry sector in Catalonia is a marginal one (Jane 20/11/2009).

On the other hand, they face social obstacles when moving timber, related to conservation or protectionist issues (Angel & Minguell 03/12/2009). And these ideas can influence the decision of the owner.

The owners often have to suspicion forest operators or industrial, we consider that in some cases leave the forest after a bad use.

- **What are the main sources of information as regards forestry matters for the fragmented private forest ownership** (professional journals, cooperatives, forest owner interest groups, forest authorities, forest management companies, nature conservation interest groups and authorities, educational organisations, forestry education, science and training centres, .... etc.)

There are many sources of information relating to the forestry sector: websites, regional offices, technicians and other county officers who are accessible to everyone, from government to private organisations. But if the owner does not actively seek advice, it is difficult to keep informed (Vilalta 30/12/2009). The focus group reports that the word of mouth (FG-1) works well. What is true is that in certain areas where forestry is low or non-existent the information is not reaching at all the owners (Vilalta 30/12/2009), while in other areas with increased activity in the sector, information is known by many (Garolera 30/11/2009)
- What about fragmented private forest ownership themselves working in their forest vs. commissioning forest work to third parties (to whom? companies, relatives and neighbours.)

It is very rarely that owners work in their forests, within fragmented properties areas, whether for their age or lack of interest in something that will not generate income (Vilalta 30/12/2009).

- What are possible reasons for non-management of private forests?

There are at least four variables that characterise private forest owners (Dominguez, 2008):

- The family’s patrimony (a moral norm).
- Aesthetic model (how the forest should looks like)
- Risk of forest fire (to protect property against forest fire)
- The financial situation of the landowner (implementation of forest management and the rewards gained from the forest can take different forms)

Fulfilling a moral norm: The moral norm that many forest owners subscribe to is derived from a custom of caring for and maintaining the family’s patrimony, and it is often passed down across generations from parents to children. It exists for many as a sort of intergenerational commitment among family members, and it can serve as an expression of the type of worldview of a particular family. That sense of moral obligation to the forest is not limited to family traditions though; in many cases it can stem from personal beliefs regarding the responsibility that individuals feel towards the natural world and conservation efforts. This moral norm is extremely powerful in some cases, but in others it can be weak or non-existent. Believing and following this moral norm favors forest owners that engage in forest management

Having an archetype to fit: While the moral norm is a sort of model that many forest owners base forest management decisions on, many forest owners also base their decisions on an aesthetic model (how the forest should looks like) of the forest that is established over time. Aesthetic models of the forest are very personal, and they are typically formed by what is familiar, especially for those forest owners that are native to forest regions, and also by the forest education received. People that are raised in the familiar type of forest environment tend to view that particular type of forest as the way a forest should look. Therefore, it is typical for forest owners to continue the forest management practices of their parents or wherever they have spent the most amount of time. Owning a forest that is far different from that set archetype can cause feelings of discomfort. Having an archetype to fit increases the possibilities that the forest owner engages in forest management.

Reducing risk of forest fire through management: Another influence that factors into the decision of whether or not to manage forests is the desire to protect property against forest fires. Forest fires pose a threat in the Mediterranean region, and they can cause serious damage to forest property. It is known by many landowners that unmanaged, wild forests are more vulnerable to fire, and in many cases, awareness of the danger posed by fire is enough to motivate forest owners to clear brush and manage their land. Forest owners subscribe to this logic to different degrees; some landowners discriminate between small forest fires that can be controlled through silviculture and larger forest fires. Depending on and individual view of the relation between management and the damage caused by forest fires, landowners will be more or less likely to manage the forest.

Fitting one’s Economy: Forest management must conform to the financial situation of the landowner, and due to the varying financial conditions of landowners, the implementation of forest management and the rewards gained from the forest can take different forms. This can range from reaping high profit margins from a small plot of land to gaining low profitability per hectare on a much larger scale; or it could simply mean that the amount of capital committed is within the financial mean of the forest owner. Forests can be viewed
as a form of capital – as the savings of the family – but it can also be viewed as an expense. None of these three perspectives leads directly to a higher involvement in forest management; what seems more important is that forest economy fit a forest owner’s expectations and personal budget.

Mainly economic, the cost is zero if something changes (Riera 30/11/2009).

- Other factors relevant in terms of attitudes, objectives and behaviour?
The conservationist view that some owners have may influence the decision to move timber or not, and how to do it (Angel & Minguell 04/12/2009).

- Any expected trends regarding relevant factors?
An increase in associacionism is expected, thanks to the experiences of associations of owners of the Barcelona County Council (FG-1). It is also expected that some segregation of the properties (ownership selling), as the heirs of the property have another main economic activity, and forest management often involves investment costs in silvicultural treatments (Garolera 30/11/2009) (cf. 4.1.1.4).

4.4 Why is there a certain level of motivation to actively participate in forestry?

4.4.1 Characteristics of private forest owners that are of central importance as regards wood mobilisation

4.4.1.1 The most important factors that explain why fragmented private forest ownership exploit or not exploit the sustainable harvesting potentials of their forests

Based on the factors that characterize the forest owners determined by G. Dominguez (2008), the conditions or factors that explain management in private property are:

| Table 35: Conditions influencing the driving forces (Dominguez, 2008) |
|----------------------------------------|----------------------------------------|
| Positive influence                     | Negative influence                     |
| **Fulfilling a moral norm**            |                                        |
| Inheritance                           | Buying the property for economic purposes (there is a house, for instance) |
| Having children to pass the property onto in the future | Property that belongs to many people that do not share common goals |
| Sense of social responsibility and pride |                                        |
| **Having an archetype to fit**        |                                        |
| Having a model of the property or the region | To be born in another area |
| Having a model through farming education |                                        |
| Having technical assistance, public or private | To have had no previous contact with this type of forest |
| **Reducing risk of forest fire**       |                                        |
| The belief that there are big and small forest fires | The belief that forest management will make no difference because the forest will burn either way |
| The belief that risk can reduce if forest is managed |                                        |
| The belief that damages will be lower if the forest is managed | The belief that methods of fire suppression are the only useful techniques |
Fitting one’s economy

<table>
<thead>
<tr>
<th>To make one’s living from forest.</th>
<th>Other important expenses that compete with the forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>To profit from the forest</td>
<td>The inability to afford forest expenses</td>
</tr>
<tr>
<td>To be able to spend money on the forest</td>
<td>Expected changes in land use (e.g. building pressure)</td>
</tr>
</tbody>
</table>

The most important factors for mobilising wood are benefit from the forest, no big expenses, having public or private technical assistance and have some knowledge in agroforestry.

4.4.1.2 Description of these factors and explanation of cause and effect in general

Fulfilling a moral norm: The moral norm that many forest owners subscribe to is derived from a custom of caring for and maintaining the family’s patrimony, and it is often passed down across generations from parents to children. It exists for many as a sort of intergenerational commitment among family members, and it can serve as an expression of the type of worldview of a particular family. That sense of moral obligation to the forest is not limited to family traditions though; in many cases it can stem from personal beliefs regarding the responsibility that individuals feel towards the natural world and conservation efforts. This moral norm is extremely powerful in some cases, but in others it can be weak or non-existent. Believing and following this moral norm favors forest owners that engage in forest management.

Having an archetype to fit: While the moral norm is a sort of model that many forest owners base forest management decisions on, many forest owners also base their decisions on an aesthetic model (how the forest should looks like) of the forest that is established over time. Aesthetic models of the forest are very personal, and they are typically formed by what is familiar, especially for those forest owners that are native to forest regions, and also by the forest education received. People that are raised in the familiar type of forest environment tend to view that particular type of forest as the way a forest should look. Therefore, it is typical for forest owners to continue the forest management practices of their parents or wherever they have spent the most amount of time. Owning a forest that is far different from that set archetype can cause feelings of discomfort. Having an archetype to fit increases the possibilities that the forest owner engages in forest management.

Reducing risk of forest fire through management: Another influence that factors into the decision of whether or not to manage forests is the desire to protect property against forest fires. Forest fires pose a threat in the Mediterranean region, and they can cause serious damage to forest property. It is known by many landowners that unmanaged, wild forests are more vulnerable to fire, and in many cases, awareness of the danger posed by fire is enough to motivate forest owners to clear brush and manage their land. Forest owners subscribe to this logic to different degrees; some landowners discriminate between small forest fires that can be controlled through silviculture and larger forest fires. Depending on and individual view of the relation between management and the damage caused by forest fires, landowners will be more or less likely to manage the forest.

Fitting one’s Economy: Forest management must conform to the financial situation of the landowner, and due to the varying financial conditions of landowners, the implementation of forest management and the rewards gained from the forest can take different forms. This can range from reaping high profit margins from a small plot of land to gaining low profitability per hectare on a much larger scale; or it could simply mean that the amount of capital committed is within the financial mean of the forest owner. Forests can be viewed as a form of capital – as the savings of the family – but it can also be viewed as an expense. None of these three perspectives leads directly to a higher involvement in forest
management; what seems more important is that forest economy fit a forest owner’s expectations and personal budget.

4.4.1.3 Please describe expected future developments of these factors

Based on interviews and focus groups, there is an increasing loss of owners devoted to their property not only because of forestry reasons but also for agricultural / livestock reasons. The processes mentioned in paragraph 4.1.1.4. are also expected to be intensified.

Public administration could help encouraging these owners to maintain their rural activities, in one way or another. The FG-2 noted that demand stimulation would be necessary (no need to subsidise the owner).

4.4.2 Also discuss the factors described under 4.1. from the perspective of:

4.4.2.1 Which incentives could be strengthened and which barriers could be overcome in the short-, medium- or long-term? (NB.: Overall research question: "measures for wood mobilization")

According to the ownership characterization made by G. Dominguez (2008) (cf. 4.3.3), policies for promoting wood mobilizations should be focused as described:

**Fulfilling a moral norm:**

Economic incentives therefore do not seem to be an appropriate way of enhancing this moral norm. Forest owners that possess these types of feelings are responsive to social recognition of the moral rule and similar types of encouragement, which is why policy tools can be a useful means of reinforcing the other three key factors. However, informational tools can be an effective way of increasing social recognition. In this sense, it is proposed that media advertisement could be used to encourage people to keep family forests, emphasizing the value of becoming part of a venerable tradition instead of creating a new solution.

**Having an archetype to fit:**

Policy tools that are intended to influence people through the transfer of knowledge, communication, persuasion, and education seem to be a good way of creating archetypes to help develop and change forest owners’ understanding of what a good forest is.

It can be said that the existence of an archetype that dictates how a good forest should look is a key factor in the decision of whether or not to carry out forest management. Many of forest owners develop forest models in childhood that continue for the rest of their lives, although some forest owners have lost the archetype altogether. The influence of the creation of a new mental archetype is most likely to be done through informative tools such as the spread of knowledge, technical assistance, and the sharing of information rather than through economic instruments or regulatory instruments.

**Reducing risk of forest fire:**

In actuality, the incentive to “clean” forests is generated through cost sharing, and it is the main – and often the only – silvicultural activity conducted by the forest owner.

**Fitting one’s economy:**

In this context, economic tools are effective when forest owners understand investments in silvicultural treatment to be an appropriate tool, as cost sharing brings them greater rewards. In fact, asking for grants (cost sharing) is one of the more frequently mentioned strategies, and it fits in the strategy of requesting financial assistance for silvicultural work.
However, when forest owners view the forest as a bank and they are not planning to make any investment, then cost sharing doesn’t seem as effective because it implies that the forest owner must make anyway an out of pocket expense. Therefore, if the forest owner does not see the need for the implementation of silvicultural practices (or any other activity) for other reasons, the existence of cost sharing alone probably won’t be enough encouragement.

When forest owners view the forest as an expense, they already perform the activities per se, because they think they have to, or they want to. In this case, just when the activities eligible for economic incentives fit in what they want to do, they will be encouraged by means of this policy tool.

4.5 What other characteristics of fragmented private forest owners are important to understand their reactions to (potential) measures that aim at mobilizing wood from their forest lands?

4.5.1.1 Please indicate factors and EXPLAIN cause and effect, as applicable: What factors, how do the impact on wood mobilisation / (potential) measures for mobilisation, relevance for all or specific categories of fragmented private forest owners; relevant in general or only under specific circumstances (which, e.g. in certain market conditions) etc.

The distance between the property and the residence of the owner, may be a factor to consider in the mobilization of wood. According to Plana (2004), in some suburban counties this has been a reason for increased forestry.
5 Mobilisation

5.1 What are measures for wood mobilisation from fragmented private forest ownership in the region?

5.1.1 Description of the measures for wood mobilisation in the region

Cf. also 3.1 (3.6.6, 3.6.1 and 3.6.2).

As a general rule, the existing subsidies are addressed mainly to stimulate forest management and maintenance, forest fire prevention and maintain the present forest activity (from forest to industry).

For forests stands:

The Environment and Housing Department (DMAH) manages subsidies for forest operations in private stands, but these are mainly addressed to those properties with a formal planification document. As previously mentioned, the great majority of properties with planification document are medium to big size properties (section 3.6.6).

Anyway, yearly some call for sustainable forest management subsidies are opened. Normally they include operations like first thinnings, forest fire prevention tasks, biomass harvesting and chipping.

There are also subsidies for associated management through forest-owners associations promoted by the province of Barcelona Council (DIBA).

Also special measures are stablished in case of natural disasters (wind storms, forests fires, etc.) in order to mobilize affected wood.

All these forest management subsidies are mainly covered through PDR funding and Barcelona County own funds.

For industry:

There are public subsidies from the Spanish government to first transformation wood industry. As an example, competitive improvement is included, being eligible production machinery or building enlargement.

Besides this, special subsidies have also been established by DMAH for transport and stockage of wood between 2009-2010 due to storms happened in 2009.

Others:

There are also other indirect promoting measures:

- Biomass heating facilities: about 30-50% of the cost is covered in order to promote renewable energies.
- Feed-in tariffs for electricity production with forest biomass: There are some ways to receive these subsidies from the Spanish government.

5.1.2 Description of the institutions and persons that initiated and implemented the measures in the region

Department of the Environment and Housing (DMAiH)-Natural Environment:

Forest Administration of Catalonia, covering all relevant topics of the natural environment: forest management, fauna species protection, extraction activities, natural and protected areas, forest fire prevention (partially) and related activities.
Forest Ownership Center (CPF):
Decentralized entity of the DMAH, participated by the private forest owners, whose objective is to promote planning and management of private forest properties. This entity processes and decides about management plans and controls forest activities included in these documents.

Barcelona County Council (DIBA)- Technical Office for Forest Fire Prevention
Technical and Administrative unit of the DIBA. Main responsibilities are forest fire prevention analysis and strategies design, and burnt areas recovering. At present they give technical and economical support for removal of the felled wood in the 2009 storms.

The main aim of this office is to provide support for the municipalities of the province and duties regarding forest fire prevention. This support is specified by joint elaboration and execution of forest fire prevention plans together with municipalities, Forest Defense Associations, and forest owners associations.

Barcelona County Council- Natural Parks network
This network is constituted by up to 12 natural areas with high valuable landscapes, ecology and culture. It guarantees a territorial and environmental balance in all the 99 municipalities within its geographical area. It plans and manages nature and farming areas through the specific plans drawn up by all the stakeholders involved. It protects the nature, farming, forest, culture and landscape values of each reserve. It commits itself to a balance between the preservation of the reserves and the financial development of towns.

This institution also gives subsidies for forest operations if included in prioritary topics of the parks network.

Catalan Institute of Energy (ICAEN)
ICAEN is affiliated with the Department of Economy and Finance of the Generalitat of Catalonia, and has legal personality and activity.

ICAEN was established with the broad aim of promoting technological and innovation projects, both in industry, tertiary and transport sectors. These activities have the support of all stakeholders related with energy: producers, users, professional associations, equipment manufacturers and engineering companies.

Consorci Forestal de Catalunya (CFC):
One role of the main forest owners association (CFC) is to increase awareness and to put some pressure over public administration in order to get better subsidies, and keep forestry activity.

5.1.3 Which are successful? Why?

All the mentioned measures are improving forest management and implementing forest fire prevention tasks. As a result much wood is mobilised (cf. 5.1.5).

Besides this, many of these measures are promoting forest management, but still, industry demand is not strong enough for consuming all mobilized wood.
5.1.4 Approximate costs of the measures taken

According to Forest Ownership Center (CPF):

<table>
<thead>
<tr>
<th>Subsidies</th>
<th>Cost (Million €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regeneration of forests damaged by forest fires and drought in 2005 and damaged by the snow of 2006</td>
<td>1.5</td>
</tr>
<tr>
<td>Drafting and revision of plans technical management and improving forest (2007)</td>
<td>0.5</td>
</tr>
<tr>
<td>Planning and promotion associated forest management (2008)</td>
<td>0.6</td>
</tr>
<tr>
<td>Sustainable forest management for the year 2009</td>
<td>6</td>
</tr>
</tbody>
</table>

According to DIBA (2009), total investment in associated forest management between 1999-2008 was 10,861,555€: 10,329,333 € from DIBA own funds; 430,426 € from the Government of Catalonia; 101,796 € from the Forest Owners Associations.

The average cost of silvicultural treatments has been 827€/ha in aged forests and 456€/ha in burned areas.

5.1.5 Estimates of the effectiveness of measures in terms of additionally mobilised wood supply

According to CPF data, mobilised wood development in private forest ownerships with management plans are:

![Graphic 15: Evolution of harvests (CPF, 2009)](image)

According to DIBA, between 2007-2008 9,487 t have been harvested, including fuelwood, in the framework of the forest owners associations.

5.1.6 Expectations regarding the future development of measures for wood mobilisation in the region

There is uncertainty because of the crisis context (FG-1). As a general rule, experts emphasized a need of promotion in the forest bioenergy sector as a energetic resource. They point at a need for demand stimulation. If there is no demand, forest management will be difficult, and if there are no public subsidies for wood mobilisation, forest harvestings will not be possible (Famadas 01/12/2009; FG-1).

With public subsidies addressed to wood stockage and transport, some enterprises have maintained their activity. Theses enterprises expect forest activity and harvesting to be recovered in some years (Jané 20/11/2009).
If there is an economic stimulus, forest owners will mobilise and more wood will be put onto the markets (Alfaras 01/12/2009).

5.1.7 The main new instruments for wood mobilisation in the region
Cf. 4.1

5.1.8 Lessons learnt from the past

Forest subsidies for private owners are considered to be interesting, but not so important as industry dinamisation. The demand is expected to be a key factor in the wood mobilisation.

Also it is important to take into account the lack of big amounts of high quality wood, then low quality destinations are to be maintained and necessarily promoted (FG-1; FG-2).

5.2 What are barriers for wood mobilisation from fragmented private forest ownership in the region?

5.2.1 Explanation of the barriers
- Traditional mentality and forest culture of the society.
- Social and political influence with respect to the bad image of felling trees.
- Degraded road network.
- Little profitability of the wood.
- High costs of exploitation.
- Lack of technification.
- Limitations in the protected areas.

The administration mainly takes the initiative to increase the mobilisation of wood, together with the few large sawmills, which are subject to the oscillations of the market.

According to the interviewed people and the focus group, the forest operations in fragmented forest properties are hindered by the following barriers:

- **Traditional mentality and forest culture of the society.** Disappearance of professions and forest workers, due to the little economic motivation. The few remaining active forest owners are ageing. Most of them have agricultural tradition or a different economic activity.

- **Social and political influence with respect to the bad image of felling trees.** During the last decades social movements have developed (in many cases of urban origin) that carry out social pressures and marketing in favor of conservacionist policies with the idea of the "wild forest". Parallelly the Catalan administration follows protectionist policies, with high restrictions in rural zones where it is not allowed, in some places, to realise forest operations.

- **Degraded road network.** Maintenance of the existing road network is not carried out, due to the rural abandonment and the low profitability of the forests. In other areas, there is even no network.

- **Little profitability of the wood.** Low prices - some 25-35 €/t - of the raw material which together with the high costs of exploitation make unprofitable the forest works. The fragmentation of the ownership and the degraded forest road network summarize more economical difficulties.
- **High costs of exploitation** (costs of transport included). At the present time, in order to cut and haulage wood, it is necessary to make other forest operations: cleaning, arrangement of roads for vehicles, cuttings, in some cases (currently valid regulations), transport (limitation of load) and other. These works are net costs that in many cases are not compensated for. According to the interviewed people, the costs can vary from 15 €/t (forest zones with accessibility and updated management) up to 40€/t approximately.

- **Lack of technification**. Most of the Catalan superficies is worked manually with working conditions that do not attract new workers. In some cases, the machinery is obsolete, old or unsuitable, especially in some sawmills and forest works companies.

- **Limitations in the protected areas**. Zones with protection frameworks have limitations for the realization of forest works. In many cases machinery can therefore not be used, nor new roads opened or the landscape modified. There are bans in order to protect wild fauna and other particular cases.

### 5.3 Which of the factors described earlier (in section 2 and 3) have the strongest impact on wood mobilisation from fragmented private forest ownership in the region?

5.3.1 Explanation of the factors with the strongest impact on wood mobilisation from fragmented forest ownership in the region

- Low profitability of forest products
- Exploitation costs
- Associationism importance

5.3.2 How do they work

There is a lack of profitability of forest harvesting because of low added value of forest products. The great majority of harvested wood is destined to pallets, packing and particle board industry, all them products with low added value. In fragmented forest ownerships, these factors add with small harvestable amounts and the possible benefit is reduced or eliminated for the owner.

The harvesting costs are high, because of some additional operations –i.e. forest road maintenance-, shrub cleaning, pruning, transport limitations, etc. Then forest owners lose interest in forest operations that do not have benefit and require investment.

It is important to get some associationism level in order to do management and operations together, then reducing harvesting costs per wood unit.

### 5.4 What other factors may be important regarding wood mobilisation from fragmented private forest ownership?

According to the interviews the most important factor that blocks the mobilisation of wood in fragmented private forest areas is a little united or structured market, in some cases absent (Tarragona and part of Lleida) and in other cases too far away. Linked to this problem is the globalisation of the market, imports of wood with very competitive prices, and lack of R&D for the local forest products.

More written contracts between forest operators and industry will help provide a greater market stability (Famadas 01/12/2009). Thus forest operators could have more security and then more capacity for wood mobilisation in fragmented forest areas.
Furthermore, forest owners should receive some compensatory benefits for forest externalities\textsuperscript{22} (social uses, landscape, biodiversity, water quality, atmospheric regulation, etc.), giving extra economic interest for forest management, and for future mobilisation of wood.

Mainly with the profitability topic, if the forest is giving economical benefits and there is no costs, work performed and forest management that are necessary. This would engage the owners in forest management, and so in wood mobilisation. From Focus Groups (FG-1; FG-2) and interviews some factors arose (Jané 20/11/2009, Alfaras 01/12/2009, Famadas 01/12/2009):

- Increase of forest biomass demand as an energetic resource
- Forest owners association promotion, in order to optimise operations
- Strategic policies for local wood promotion
- Products diversity increase, new products obtention
- Technological innovation in forest sawmills
- Reduce transport limitation for wood transport
- Forest externalities compensation
- Marketing and promotion of forest sector, from forest harvesting to industry
- Public subsidies for professionalisation of forest operators and industry
- Promote wood classification

\textsuperscript{22} Conclusions de les Jornades sobre Incendis Forestals i Recerca. Xarxa ALINFO. CTFC, Solsona, juny 2003
6 Discussion

The fragmented private forest areas are located in zones with subhumid and semiarid climatology. Most of Catalonia is under high risk of forest fires, being more important in the center and south of the region. However these zones are those that present higher risk of forest fires.

The zones with relatively low yield (m3/ha/any) are located mainly in the center-west and south of Catalonia.

The bigger private forest stands present the highest yields, and they have some form of planification with some type of forest operations. Tarragona is the Catalan province that presents more fragmented areas.

Most of the forest areas of the south and west of Catalonia are far from the wood markets.

The market framework (low prices and high costs), together with the social (social rejection of the forest operations) and the administrative (bureaucracy and protectionist policies) is not favourable for the increase of forest operations in these zones.

The region of Catalonia does not have a consolidated structure in forestry. This structure works based on uncertain steps related to grants and subsidies from the regional government. Besides this failure forest owners are quite conservative, coupled with low knowledge and a loss of the forest wisdom.

One must also wonder: is it necessary to carry out forest exploitation in every forest? If forest exploitation can be performed: can forest owners be asked or forced to do that?

What is clear is that there are areas where one can perform exploitation and somehow partnerships between owners and associations should be enhanced. In addition, there is less and less people who can and know how to work in forests (both society and the property). It is necessary to create an attractive rural-forest environment to people who have fragmented forest properties, as this can motivate them to work with the property.

These days everyone talk about conservation, environment, climate change and others, but they are not talking about people who take care of this environment. These are the people who harvest trees, forest owners and others living in the forest.
7 Conclusions

7.1 About forest sector in general
- Disappearing forest tradition, much knowledge and culture have been lost due to the abandonment of the rural areas and the traditional activities.
- Lack of technological innovation and few investments in R&D, for the forest operations and works as well as for the industries.
- High costs of operation.
- Little dissemination of the benefits of the forest sector for the society and the forest.
- Forest information (helps, planification and other) arrives to the zones with more forest activity.
- Little profitability of many local forest products, due to a lack of added value.
- Degraded and non optimised forest road network.

7.2 About the fragmented forest ownership in Catalonia
- Most of the Catalan forest owners are getting old, and therefore there is less motivation for performing forest operations and management. Moreover for the new owners of the forest properties, either for inheritance or purchase, forests are not considered a productive good.
- Catalonia shows a high forest private property of 87%. 70-90% of the total number of forest properties are considered small. Tarragona is the zone with the highest area of fragmented ownerships
- Many forest owners have agricultural tradition
- Changes in the mentality of the owners, more diversity of activities. Some of them go from the primary sector to the tertiary.
- Associations of owners are getting stabilized in the province of Barcelona, which are backed up by the administration through the management of a technician of the Provincial Government of Barcelona.
- The forest owners of small and fragmented areas do not know the existing forest information very much.
- Some owners do not know the dimensions nor locations of their own properties.
- New owners many times consider the forest as: second residence, investment for patrimony and leisure.

7.3 About roundwood consumers
- Little known productive sector, and organizationally poorly developed,
- The consumption of roundwood concentrates in the Pyrenean and pre-Pyrenaic regions,
- The French wood competes with the Catalan (quality and transport costs). Imports are detected.
- Decrease of the amount of small sawmills and increase of wood volume of the big ones.
- Adaptation of industry to the characteristics of the wood of the region.
7.4 About the forest industry

Lack of wood in the region

7.5 Measures to combat deficiencies and promote the mobilisation of wood in fragmented forest-ownership structures.

Analyze, study and more detailed account of forest statistics, properties and other resources. Inventory potential forests for exploitation, categorize optimal timber resource areas, accessibility to forest land,

Strengthen basic education for the forestry sector. Inclusion in schools, training centers, universities and other, knowledge related to forestry topics, the need to create an awareness of the forest situation.

Increase the R & D, foster the already existing R&TT Centers in order to develop research on harvesting improvement, new products, optimization of resources, scientific and technical support to forest owners

Encourage cooperatives and associations between owners of fragmented forestlands, or create figures to support the management of fragmented forestland. One possible way would be through consortia, or through local clusters in areas with more fragmentation.

Provide forestry information to owners with agrarian, farming or other background, to give them new perspectives.

Enhance regional wood consumption. Encourage marketing of wood products

Keep subsidies and grants to the forest owners, but also extend these to industry and forestry enterprises, thus promoting the mobilization through enhancing the demand.
8 References


Departament d’economia i finances. Acords de Govern. Generalitat de Catalunya. 2005


Raddi, A. (2008). Demanda total i consum aparent de fusta a Catalunya. Fulls formatius

8.1 List of interviews (experts, date, place)

Jané J. 20/11/2009, Solsona
Pujol C. 20/11/2009, Solsona
Riera J. 30/11/2009, Sant Feliu de Buixalleu
Garolera 30/11/2009, Arbúcies
Famadas J. 01/12/2009, Argentona
Alfaras X. 01/12/2009, Sant Celoni
Rovira J. 3/12/2009, Santa Coloma de Farners
Angel J.C. & Minguell J. 04/12/2009, Navàs
Palomé LL. 04/12/2009, Torrelles del Llobregat
Serradora Boix (several technical) 10/12/2009, Puig-Reig
Vilalta 30/12/2009, Vilanova de Prades

8.2 Focus Group Sessions

FG-1 13/01/2010
Participants:
Lluis Serra (Tècnic de la Diputació de Barcelona).
Teresa Cervera (Cap de l’Àrea Tècnica del Centre de la Propietat Forestal).
Pere Garriga (Associació de propietaris Forestals Rebrot).
Josep Rius (Cooperativa de Productes Forestals del Bages/Associació de propietaris Serra de Rubio).
Joan Jou (Unió de Pagesos).
Josep Escalder (Associació de Propietaris del Bages).

FG-2 19/01/2010
Participants:
Xavier Alfaras (Associació de Propiarios del Montnegre-Corredor).
Josep Mataró (Associació de Propietaris del Montseny).
Jaume noguer (Tècnic de Fustes Martorell).
Miquel Soliva (Fustes Soliva).
Miquel Oliveras (Fustes Oliveras).
Aitor Goñi (Departament de Medi Ambient i Habitatge).
Josep Mª Tusell (Consorci Forestal de Catalunya).
Rafael Acero (Profesor de l’Escola de Capacitació Agrària).
Fact sheet of the case studies results
## Fact sheet of the case studies results

<table>
<thead>
<tr>
<th></th>
<th>Austria</th>
<th>Sweden</th>
<th>England (UK)</th>
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<th>Estonia</th>
<th>Saxony (Germany)</th>
<th>Catalonia (Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the total forest cover in the region?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) % of the total area?</td>
<td>47.2 %</td>
<td>56.00%</td>
<td>8.4%</td>
<td>37%</td>
<td>19%</td>
<td>48.9%</td>
<td>28 %</td>
<td>63.51%</td>
</tr>
<tr>
<td>ii) How did it develop during the last 10 years (approx.)? (change % per annum)</td>
<td>+0.4</td>
<td>Varied between 55.5 and 58.1 since 1923</td>
<td>+0.6%</td>
<td>+2%</td>
<td>+0.2%</td>
<td>n/a (2005 to 2007 - 2.5%)</td>
<td>+0.05%</td>
<td>+0.75%</td>
</tr>
<tr>
<td>2. What is the wood mobilisation in terms of annual increment?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Harvest in percent of the increment?</td>
<td>60.1%</td>
<td>71%</td>
<td>39%</td>
<td>40%</td>
<td>50%</td>
<td>57.9%</td>
<td>~40%</td>
<td>24%</td>
</tr>
<tr>
<td>ii) How did it develop during the last 10 years (approx.)? (change % per annum)</td>
<td>-11.3%</td>
<td>NA</td>
<td>-7%</td>
<td>-1.0%</td>
<td>NA</td>
<td>** (NA)</td>
<td>4.14%</td>
<td></td>
</tr>
<tr>
<td>3. Is there legal uncertainty regarding forest ownership? (yes or no)</td>
<td>No</td>
<td>NO</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>4. What is the structure of the regional wood markets, in terms of ....?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 ...buyer/seller ratio? (number of seller per buyer)</td>
<td>1:78</td>
<td>1:235</td>
<td>NA</td>
<td>1:1000</td>
<td>1:11</td>
<td>NA</td>
<td>1:450</td>
<td>is difficult to tell, some sellers are categorized as forest service companies (all types)</td>
</tr>
<tr>
<td>4.2 ...other structural market factors?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Average distance between different types of sellers (e.g. fragmented private forest ownerships) and different types of buyers (km)</td>
<td>NA</td>
<td>79km/m³ of roundwood</td>
<td>NA</td>
<td>100-300 km</td>
<td>under 100 km</td>
<td>NA</td>
<td>Small: 10-50 Large: 150-200 km</td>
<td>80km</td>
</tr>
<tr>
<td>ii) Harvesting costs to forest road by ownership category? (excluding stumpage sales) (€/m³ o.b.)</td>
<td>SSFOS 37.44 €/m³</td>
<td>PFD 21.95 €/m³</td>
<td>AF 24.40 €/m³</td>
<td>Around 9 € for harvesting and 13 € for thinning</td>
<td>9.99 EUR/cum</td>
<td>200/m³</td>
<td>10-156/net m³</td>
<td>16€/m³</td>
</tr>
<tr>
<td>iii) The informal market segments (subsistence, supply to family members, neighbours, etc.) in % of total market? (if no data is available please indicate whether or not it is considered to be a relevant segment or not)</td>
<td>20%</td>
<td>Very small</td>
<td>Relevant</td>
<td>40-50%</td>
<td>10-15%</td>
<td>10%</td>
<td>25% (all pr.), 50% (frag.)</td>
<td>Very small</td>
</tr>
<tr>
<td>iv) Are informal market segment expected to expand or decrease? (expand, stable or decrease)</td>
<td>constant</td>
<td>Stable</td>
<td>Expand</td>
<td>Expand</td>
<td>Stable</td>
<td>Stable</td>
<td>Expand</td>
<td>Decrease</td>
</tr>
<tr>
<td>v) Do wood price changes influence the regional supply by private forest owners (yes or no)?</td>
<td>Yes</td>
<td>yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Typical wood sales methods in the region? (e.g. standing, auction, long-term contract, ad-hoc on individual basis, etc.) Please name the most important one or two!</td>
<td>forest-roadside</td>
<td>Delivery timber 33%</td>
<td>Standing forest timber 27%</td>
<td>Felling by purchaser 26%</td>
<td>Negotiation, Ad hoc</td>
<td>Individual Ad-hoc</td>
<td>Ad-hoc Standing-on stock</td>
<td>Ad-hoc Individual ad hoc, long-term</td>
</tr>
</tbody>
</table>
### 6. How are the forest owners to be characterised?

<table>
<thead>
<tr>
<th></th>
<th>Austria</th>
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<th>Saxony (Germany)</th>
<th>Catalonia (Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) % share of &quot;organized&quot; forest owners by number (Forest management organisations e.g. in owners associations, loose groups, cooperatives, co operations – NOT only political organisations)</td>
<td>37%</td>
<td>50.00%</td>
<td>NA</td>
<td>5%</td>
<td>78%</td>
<td>5%</td>
<td>2.8% (cooperatives), 4.6% (own. association)</td>
<td>1% (respect all owners)</td>
</tr>
<tr>
<td>ii) % share of &quot;organized&quot; forest owners by forest area (Forest management organisations e.g. in owners associations, loose groups, cooperatives, co operations – NOT only political organisations)</td>
<td>21.9%</td>
<td>50.00%</td>
<td>NA</td>
<td>10%</td>
<td>78%</td>
<td>7%</td>
<td>7% of total forest area, 20% of private forest</td>
<td>17% (cooperatives) 32% (own association) 37%</td>
</tr>
<tr>
<td>iii) % share of roundwood sales by &quot;organized&quot; forest owners (Forest management organisations e.g. in owners associations, loose groups, cooperatives, co operations – NOT only political organisations)</td>
<td>18.8%</td>
<td>na</td>
<td>25%</td>
<td>34%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>74%</td>
</tr>
<tr>
<td>iv) Most frequent types of organized forest owners associations in the region (loose groups, cooperatives, co-operations or unions)</td>
<td>Co-operations</td>
<td>Forest owners associations</td>
<td>Loose groups</td>
<td>Forest associations</td>
<td>Cooperatives</td>
<td>Business companies</td>
<td>Associations (based on ngo law)</td>
<td>Cooperatives</td>
</tr>
<tr>
<td>v) Is there a trend towards increased cooperation between small/fragmented private forest owners (yes or no)?</td>
<td>Yes</td>
<td>unclear</td>
<td>Yes (slow)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### 6.2 Are there cross forest owners and wood industry associations in the region (yes or no)?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>No</th>
</tr>
</thead>
</table>

### 7. What is the role of forest authorities regarding fragmented private forest ownerships participation in the wood markets?

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Some controls</th>
<th>Guidance/ control</th>
<th>Control</th>
<th>Control</th>
<th>Control, Guidance</th>
<th>Guidance (Control)</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) On harvests of fragmented private forest ownerships? (guidance, control or none)</td>
<td>Control</td>
<td>Some controls</td>
<td>Guidance/ control</td>
<td>Control</td>
<td>Control</td>
<td>Control, Guidance</td>
<td>Guidance (Control)</td>
<td>Control</td>
</tr>
<tr>
<td>ii) On timber sales of fragmented private forest ownerships? (guidance, control or none)</td>
<td>None</td>
<td>Only through the measurement law</td>
<td>Guidance/ control</td>
<td>None</td>
<td>None</td>
<td>Non</td>
<td>Guidance</td>
<td>None</td>
</tr>
</tbody>
</table>

### 8. Structure of forest ownership in the area in terms of forest resources:

<table>
<thead>
<tr>
<th></th>
<th>80.6%</th>
<th>50.00%</th>
<th>82%</th>
<th>72%</th>
<th>44%</th>
<th>33%</th>
<th>45%</th>
<th>88%</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) % share of private forest ownership by forest area?</td>
<td>80.6%</td>
<td>50.00%</td>
<td>82%</td>
<td>72%</td>
<td>44%</td>
<td>33%</td>
<td>45%</td>
<td>88%</td>
</tr>
<tr>
<td>ii) % share of fragmented private forest ownership by forest area?</td>
<td>49.4%</td>
<td>50.00%</td>
<td>NA</td>
<td>40%</td>
<td>4%</td>
<td>70.7% (from private forest)</td>
<td>23% (from all forest)</td>
<td>20% (&lt;10ha)</td>
</tr>
<tr>
<td>iii) How did the share of fragmented private forest ownership develop during the last 10 years (approx.)? (change % per annum)</td>
<td>-15% (1999-2007)</td>
<td>same</td>
<td>NA</td>
<td>-1.5%</td>
<td>n.a.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>iv) Harvest in percent of the increment in fragmented private forest ownerships</td>
<td>46.2%</td>
<td>80.00%</td>
<td>NA</td>
<td>NA</td>
<td>50%</td>
<td>59%</td>
<td>(est. &lt; 20%)</td>
<td>NA</td>
</tr>
<tr>
<td>v) How did the harvest in percent of the increment in fragmented private forest ownerships develop during the last 10 years (approx.)? (change % per annum)</td>
<td>-12.5% (1999-2007)</td>
<td>Approximately the same, higher after Gudrun</td>
<td>NA</td>
<td>NA</td>
<td>n.a.</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>9. Describe the structure of fragmented forest ownership in the area by number... (if information is available only for certain sub-regions please indicate by *)</td>
<td>Austria</td>
<td>Sweden</td>
<td>England (UK)</td>
<td>Rhone-Alpes (France)</td>
<td>Hungary</td>
<td>Estonia</td>
<td>Saxony (Germany)</td>
<td>Catalonia (Spain)</td>
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</tr>
<tr>
<td>i) % share of Non-farm forest ownership?</td>
<td>33% (all private forest owners)</td>
<td>NA</td>
<td>NA</td>
<td>75%</td>
<td>n.a.</td>
<td>60-70%</td>
<td>all PFO: 91-92% area, 96% owners</td>
<td>perception of increasing</td>
</tr>
<tr>
<td>ii) % share of Non-resident forest owners? (e.g. more than 15km or 30min away)</td>
<td>6% more than 20km (all private forest owners)</td>
<td>26.00%</td>
<td>NA</td>
<td>35%</td>
<td>n.a.</td>
<td>NA</td>
<td>all PFO: 85% (30min distance)</td>
<td>perception of increasing</td>
</tr>
<tr>
<td>iii) % membership in forest owner cooperatives (Forest management organisations e.g. in owners associations, loose groups, cooperatives, co operations – NOT only political organisations!)?</td>
<td>37%(all private forest owners)</td>
<td>50.00%</td>
<td>NA</td>
<td>3%</td>
<td>n.a.</td>
<td>NA</td>
<td>NA</td>
<td>few of the total</td>
</tr>
<tr>
<td>iv) % secondary education in forestry and agriculture?</td>
<td>13.8% (all private forest owners)</td>
<td>Small part</td>
<td>NA</td>
<td>NA</td>
<td>n.a.</td>
<td>NA</td>
<td>all PFO: 43% (1999)</td>
<td>few of the total</td>
</tr>
<tr>
<td>v) % tertiary education in forestry and agriculture?</td>
<td>4.5% (all private forest owners)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>n.a.</td>
<td>NA</td>
<td>all PFO: 8% (1999)</td>
<td>very few</td>
</tr>
<tr>
<td>vi) Major attitudes of fragmented private forest ownership towards their forests (e.g. income, family tradition, investment, etc.)?</td>
<td>Slaves1 highest priority (1) sustainability (2) own use (3) tradition (4) free time (5) investment (6) hunting (7) income (8) working place</td>
<td>Production, recreation, income, feeling of home etc.</td>
<td>Hobby owner, family, tradition, sporting, investment</td>
<td>Family tradition</td>
<td>Family inheritance</td>
<td>NA</td>
<td>ALL PFO: Tradition/heritage, Asset, Own require. (1999)</td>
<td>The family’s patrimony, Aesthetic model, Risk of forest fire, the financial situation of the landowner</td>
</tr>
<tr>
<td>vii) Guiding management objectives (e.g. derive income, reserve growing stock, etc)</td>
<td>Slaves1 highest priority (1) maintaining capital (2) increasing profit (3) selling the forest (4) abandoning forestry (5) own use (6) hunting</td>
<td>Economy, environment and recreation</td>
<td>Biodiversity, timber, sporting, production, amenity</td>
<td>Pass on quality forest</td>
<td>n.a.</td>
<td>NA</td>
<td>ALL PFO: own requirements, reserve stock (1999)</td>
<td>Economic and sentimental</td>
</tr>
<tr>
<td>iv) Important incentives to join in or delegate forest work?</td>
<td>NA</td>
<td>Time, easier to hire someone</td>
<td>NA</td>
<td>Forest associations</td>
<td>Massif development plan</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>10. What are measures for wood mobilisation from fragmented private forest ownership in the region?</td>
<td>Austria</td>
<td>Sweden</td>
<td>England (UK)</td>
<td>Rhone-Alpes (France)</td>
<td>Hungary</td>
<td>Estonia</td>
<td>Saxony (Germany)</td>
<td>Catalonia (Spain)</td>
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</tr>
<tr>
<td>i) Owner associations / Community Forestry (yes or no)</td>
<td>Yes</td>
<td>yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ii) Forest service companies / Forest management services (yes or no)</td>
<td>Yes</td>
<td>yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>iii) Communication / Advertisements (yes or no)</td>
<td>Yes</td>
<td>yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>iv) Forest Management Grants / Subsidies (yes or no)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes (aid to improve)</td>
</tr>
<tr>
<td>v) Advisory services by authorities (yes or no)</td>
<td>No</td>
<td>Yes to some extent</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>vi) Training / or educational programs by authorities (yes or no)</td>
<td>Yes</td>
<td>No, by forestry associations</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>vii) Legal framework to prevent further fragmentation (yes or no)</td>
<td>No</td>
<td>yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>viii) Others (yes or no)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes (improving demand)</td>
</tr>
<tr>
<td>Austria</td>
<td>Sweden</td>
<td>England (UK)</td>
<td>Rhone-Alpes (France)</td>
<td>Hungary</td>
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<tr>
<td><strong>Owner related:</strong> Traditional and non-traditional forest owners with different social backgrounds</td>
<td><strong>Owner related:</strong> Economy and market prices Owners goals</td>
<td><strong>Owner related:</strong> Barrier: lack of owners forestry knowledge/capacity</td>
<td><strong>Owner related:</strong> Education of forest owners Action for grouping</td>
<td><strong>Owner related:</strong> Own use, Limited wood volume</td>
<td><strong>Owner related:</strong> Small size (average 10 ha) of ownership does not have economic efficiency. Small size is result of the restitution of farm-related Forests to new owners, who by large are not farm-related. Missing systems to increase fragmented owners c-operation (local association main focus is training, information), wood trading systems established very recently. Wood market dominated by major pulp and saw mills in Finland, Sweden: for them Estonia is a market with secondary importance (used when their local market cannot match the demand). Owners are not managing the supply, but rather following the buyers (inc sales methods)</td>
<td><strong>Owner related:</strong> Average PFO property size of 3.2 ha; high degree of fragmentation Lacking information concerning forest management and wood marketing. Boundaries of estates are sometimes unknown, Other than economic owner’s objectives</td>
<td><strong>Owner related:</strong> Many forest owners have agricultural tradition; Accessibility; low-value wood</td>
<td></td>
</tr>
<tr>
<td>Number and share of non-traditional forest owners seem to be growing as a result of the ongoing structural change in the agricultural sector Private small scale forest owners with lacking knowledge in forestry</td>
<td>External: Strong impulse for the debate came with the intensified use of wood biomass from the forest for energy production which on the one side offered a new market for the land owners Wood biomass a new competition for the material to the pulp and paper and panel industries</td>
<td>External: Barriers: regulations of wood measurement Feeling of security and stability of the market actors</td>
<td>External: Guidance and coordination work</td>
<td>External: High VAT, strict regulations</td>
<td>External: Regulatory system perceived as overly bureaucratic and time consuming Grants: EWGS (management planning), RDPE (capital grants), RHI (demand driver)</td>
<td>External: Taxation rules: private physical persons cannot deduct forest management costs from sales income before paying income tax. This reduces wood trading profitability. Truck weight limit of 41 tons: modern, fully loaded truck weight is ca 60 tons. Poor forest road network Ageing community, mostly living in cities, poorly linked to their estates</td>
<td>External: Prices, markets, regulations, fire risk,</td>
<td></td>
</tr>
<tr>
<td>Austria is a mountainous country which often implies high logging costs, and it is a developed country, which implies high salaries for forest workers</td>
<td>Wood biomass a new competition for the material to the pulp and paper and panel industries</td>
<td>Public issues are not strongly debated, such as the possible degradation of the sites through a loss of nutrients, or the positive contribution of forestry and the forest industry to rural development</td>
<td>Austria is a mountainous country which often implies high logging costs, and it is a developed country, which implies high salaries for forest workers</td>
<td>Public issues are not strongly debated, such as the possible degradation of the sites through a loss of nutrients, or the positive contribution of forestry and the forest industry to rural development</td>
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<td></td>
</tr>
<tr>
<td>Fragmented structure of the small forest ownership (&lt;200ha)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>Sweden</td>
<td>England (UK)</td>
<td>Rhone-Alpes (France)</td>
<td>Hungary</td>
<td>Estonia</td>
<td>Saxony (Germany)</td>
<td>Catalonia (Spain)</td>
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</tr>
<tr>
<td>Own wood use (subsistence) of the Austrian small scale forest owners is very high and the level is similar among all sizes of small scale forest ownership (&lt;200ha).</td>
<td>Knowledge-level</td>
<td>Biodiversity</td>
<td>To assure family inheritance, symbolic good to pass on to the next generation</td>
<td>No cooperation attitude</td>
<td>Forest as a source of income, mainly additional income to daily jobs</td>
<td>‘New’ forest owners – though only small in number and area - are rather economically interested (i.e. in wood marketing);</td>
<td>Most of the Catalan forest owners are aging old, and therefore there is less motivation for performing forest operations and management.</td>
<td></td>
</tr>
<tr>
<td>Trend in forest management goes away from the bread tree spruce to mixed wood because – discussion about climate change.</td>
<td>Economy</td>
<td>Hobby owner</td>
<td>To save money for time in need</td>
<td>Forest as a future investment, additional income to pension</td>
<td>Ownership as a driver for social value.</td>
<td>Owners of new acquisition consider the forest owned as: second residence, investment on patrimony and leisure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private small scale forest owners often are not educated or trained for forest management.</td>
<td>Tradition</td>
<td>Self-sufficiency for timber</td>
<td>To preserve nature</td>
<td>Family link and tradition.</td>
<td>The ownership received in the process of restitution relates the current owners in a meaningful way to their grandparent, who lost forcefully the ownership.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A large part of private small scale forest owners do not have economic-oriented goals for their forest property.</td>
<td>Amenity (e.g. sporting)</td>
<td>To have social relation through their forest</td>
<td>Potentially large numbers of owners have not thought through the objective of the ownership.</td>
<td>Ownership as a driver for social value.</td>
<td>The land was received more as largely unexpectedly through restitution, but ownership has not found a role in the owners’ life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest care is an important goal in the small forest owners milieu.</td>
<td>Landscape</td>
<td>No objective, disappointment</td>
<td>The land was received more as largely unexpectedly through restitution, but ownership has not found a role in the owners’ life.</td>
<td></td>
<td>Potentially large numbers of owners have not thought through the objective of the ownership.</td>
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<table>
<thead>
<tr>
<th>Actual behaviour</th>
<th>Sweden</th>
<th>England (UK)</th>
<th>Rhone-Alpes (France)</th>
<th>Hungary</th>
<th>Estonia</th>
<th>Saxony (Germany)</th>
<th>Catalonia (Spain)</th>
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</thead>
<tbody>
<tr>
<td>Small scale forest ownerships (&lt;200 ha) in Austria show a strong positive supply reactions towards wood price signals. In case of more traditional small scale forest owners and based on the supply behaviour from the past the wood reserves aren’t predominantly located in the fragmented private forest ownership because the annual felling rate per ha in this group is higher than in the other ones.</td>
<td>Harvest according to price given and market</td>
<td>Lack of management due to poor knowledge</td>
<td>To cover cost</td>
<td>Urban owners are not interested in the ownership</td>
<td>Minority of owners are actively managing their ownerships, majority are passive owners</td>
<td>Management in most cases: for firewood use (own requirements, neighbours and friends); in case wood/timber should be sold to the market to derive some income: stumpage sales (forest operators, industry) or assortment sales with the help of the state forestry enterprise.</td>
<td></td>
</tr>
<tr>
<td>Use of advisory services</td>
<td>Lack of management due to economic returns</td>
<td>To maintain reserve of biodiversity</td>
<td>To pass on to next generation</td>
<td>Countryside owners want to use the forest for own.</td>
<td>The use of contractors is increasing, logs are sold as assortment, pulpwood as cutting right</td>
<td>Wood has important role as raw material for the owner and his family (own use for energy, construction).</td>
<td></td>
</tr>
<tr>
<td>To get an income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Owners receive and expect to receive financial support from state for the forest management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Low yields
- Little interest in the property,
<table>
<thead>
<tr>
<th>Austria</th>
<th>Sweden</th>
<th>England (UK)</th>
<th>Rhone-Alpes (France)</th>
<th>Hungary</th>
<th>Estonia</th>
<th>Saxony (Germany)</th>
<th>Catalonia (Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which sorts of policy measures (to facilitate participation in forest product market) would the fragmented forest owners in your region be more responsive towards?</td>
<td>Forest management plan “light” There is a lack of financing of further actions that would require more personnel that approaches and supports the forest owners</td>
<td>Knowledge increases in different ways Public opinion important</td>
<td>Reduction in bureaucracy Quicker response period to felling licence applications Drivers to increase and (and therefore price for timber), e.g. RHI &amp; the Wood Fuel Strategy for England</td>
<td>Extension of massif development plans which are a local program to implement grouped actions with CRPF guidance and coordination Forest association is a model to develop to increase wood mobilisation on the long term</td>
<td>Less admin National incentives maintained</td>
<td>Improve data collection on fragmented forest owners (create system, rather than project) Provide incentives for fragmented forest owners wood trade (no taxation on income received from sales, no other burdens like road restrictions), Support and develop forest owners economic co-operation/consolidation, Support for investments to reduce logging costs/route to the market (support road construction investments) Support for silvicultural investments (pre-commercial thinning, young stand treatment) Support for programs that increase forest owners and stakeholders awareness on forestry as well as on wood mobilisation</td>
<td>Information/Training and advice (by state forest rangers) - concerning management, harvesting operations, prices and marketing; - should be existent for a long time period for trust building Subsidies - indirect: see above (advice, information, training) and via direct infrastructural help (road building) - direct: infrastructure</td>
</tr>
</tbody>
</table>

| What other factors may be important to describe the fragmented forest owners in your case study region? | Chamber of Agriculture advises the private small scale forest owners and initiated together with forest owner cooperatives a network of “wood mobilisers” (Waldhelfer), which has successfully pushed the harvest activities in Austrian small scale forests. The “wood mobilisers” are a part of forest services for wood supply provided by the chamber for fragmented private forest ownership Austrian forest authorities in Austria primarily have a supervising or control and not a guidance function regarding harvests of fragmented private forest ownership | Most of the forest owners are not dependant on their land for income, but still wants to manage their forest well Heterogeneous profile Multiple objectives | Wood mobilisation is dependent on many factors on the surface area of ownership but also species, fertility of soils, local economy, accessibility are very various in the region and may impact strongly on the wood mobilisation. | Low degree of organisation Fragmentation is expected to continue due to heritage and further partition Willingness to sell the property is presently decreasing (wood energy becomes more important) Road construction is often difficult to organise because of the number and shapes of small forest properties | Many owners depend on resources from outside the property. Little forest tradition, much knowledge and culture have been lost due to the abandonment of the rural areas and the traditional activities | | |