

An analysis of forest companies in Catalonian Region: level of specialization and share of coppice forest in annual turnover



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1. Introduction

In the economy of timber harvesting, the deployment of appropriate equipment and work systems for the specific forest type is crucial for the economic sustainability of the whole supply chain (Enache et al. 2015). This is even more important in the case of coppice forests, where the low size of stems require the use of specific solutions and machinery both for the economic (Spinelli et al. 2009) and environmental sustainability of the operations (Laschi et al. 2016).

In general terms, a higher mechanization level leads to a higher productivity and lower unitary costs for woody products from coppice forests (Laina et al. 2013). In this sense, the correct and full exploitation of the potential of a given territory may be achieved only if an adequate level of specialization is present in the local forest companies. Analysis of forest companies characteristics allow the identification of trends, permits to highlight strengths and weaknesses of the productive system, and permits to plan strategies for enhancing the regional technical capacity and economic potential (Spinelli et al. 2013).

In the specific case of the Spanish Catalanian Region, timber production experienced a net increment in the last few years. This increment is mostly driven by timber production from conifer forests, but firewood production (the main product of local coppice forests) shows the second most important growth. In order to be sustainable and to provide the maximum added value to the region, this market growth must be supported by an adequate level of forest companies growth both in terms of equipment and employees and in terms of specialization (e.g. through training).

		Year		Increment
		2009	2015	
Timber (m ³)	Conifer	215,664	745,453	346%
	Broadleaves	73,993	123,819	167%
Firewood (t)		159,813	289,317	181%

Source: Observatori Forestal Català, 2016

Table 1 – Wood products trend in Catalonia

2. Purpose

The STSM aimed at characterizing the Catalanian forest companies, both considering the level of mechanization and the skills available for forest harvesting and first transformation of wood products. The study includes the whole of the forest sector, but is designed for pinpointing the role of coppice forest for the local companies.

3. Methods and locations

The first stage of analysis included informal interviews with forest operators, researchers and forest technicians of the public administration (Generalitat and municipalities). This was meant to understand the local market and the specific characteristics of coppice forests within the local forest sector. In addition, bibliographic and statistical data was acquired and studied for providing a wider overview of the forest sector and more specifically of coppice forests in Catalonia.

As anticipated, the main tools for conducting the study were a questionnaire presented to the local forest companies and the analysis of subsidies of the Generalitat de Catalunya (Regional Authority) for the purchase of new equipment.

Questionnaire

This task can be further divided in three sub-tasks:

1. Development of questionnaire and direct interviews

A first draft of the questionnaire was established together with the colleagues of CTFC and according to the suggestions of the technicians of the Forest Services of the Generalitat de Catalunya. The draft was deployed during the first “scouting” interviews, which were used for understanding the impact and effectiveness of the questionnaire. The feedback and suggestions of the interviewed entrepreneurs were used for creating the final version of the questionnaire.

The questionnaire is constituted by 10 questions and was written in Spanish language originally. In order to increase the willingness of forest companies to fill out the survey, it has been decided to translate the form also in Catalan language. In fact, for several forest operators of the Pyrenees ridge and Girona province, this is the first and main language.

2. Design of online survey and distribution via email

In the proposed work plan it was expected to use the survey-support software SurveyMonkey (www.surveymonkey.com), a dedicated online service for survey development, distribution and analysis. Nevertheless, in order to gain a higher control over the survey, the service of Google Forms was used, implementing the survey in a dedicated Google account.

The screenshot shows a Google Forms interface for a survey titled "Enquesta empreses aprofitament forestal a Catalunya". The background image depicts a forest scene with a tree stump and a chainsaw. The form includes a header with the title and a brief description of the survey's purpose. Below the header, there is a section titled "Dades de l'empresa" (Company Data) which contains a "Protecció de dades" (Data Protection) notice. The notice states that the survey is part of a project by the Centre Tecnològic Forestal de Catalunya and that the data collected will be used for scientific analysis. At the bottom, there is a field for "Ubicació de l'empresa (municipi)" (Company location (municipality)).

Figure 1 – Layout of the online questionnaire

Once finalized and successfully tested, the survey was distributed via email by mean of an existing mailing list address “Biomassa”, commonly used by the Forest Mechanization and Biomass Production team of CTFC for communicating with the local forest companies.

The links leading to the two version of the questionnaire can be found below:

<https://goo.gl/forms/G9TjxEgFsM3JOi0h2> Catalan survey

<https://goo.gl/forms/sud8y9CyzJdyA0ya2> Spanish survey

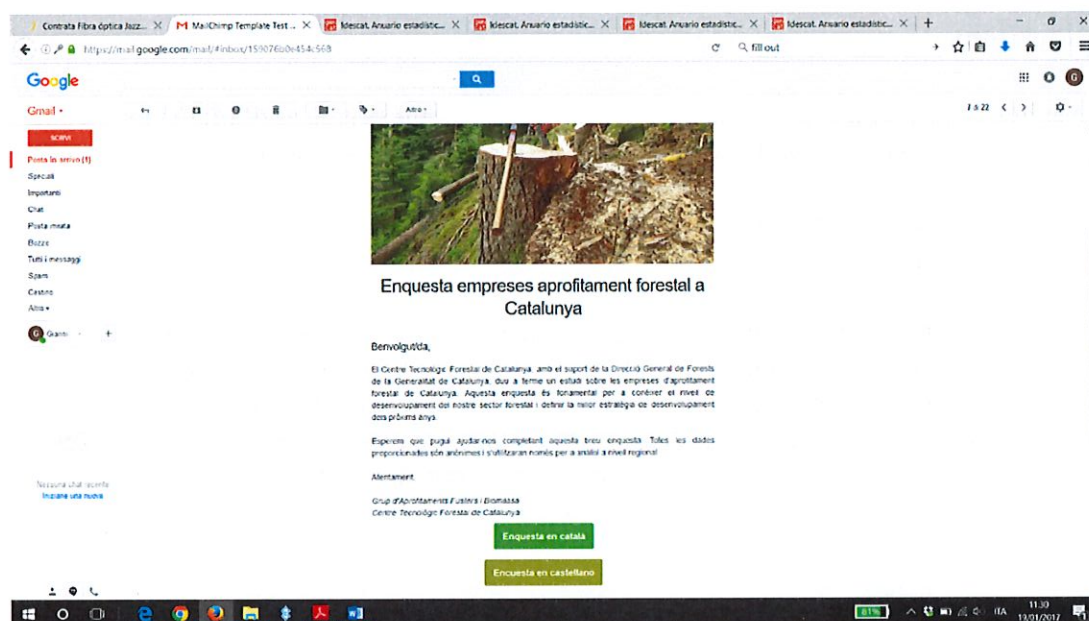


Figure 2 – Screenshot of the sent email, including introduction, privacy statement and links to the questionnaires

Contacts of the forest companies were extracted from the database provided by the Observatori Forestal Català, which lists 342 enterprises self-registered as “Treballs Forestals” type (Forest Work) plus 39 enterprises self-registered as “Maquinaria agroforestal” type (Agroforestry machinery). Of these, about 170 active email addresses were collected (some repeated email was found afterwards).

3. Telephone interviews

Telephone interviews have not been done yet, as this task will start when the online survey will be closed (the last reminder has been sent recently). This last part is necessary for reaching as many companies as possible. This activity will start soon and will be closed within February.

Subsidy files analysis

Subsidy files are available just in paper form at the central offices of the Forest Services of the Generalitat de Catalunya. Forest oriented grants for the acquisition of equipment were included in a broader annual call, including grants for the enhancement of forest property (thinnings, forest road works) as well as other forest related activities (e.g. dissemination and sensibilization of the population). At the moment, the available approved grant files range from year 2007 to 2014 included.

Activity locations

The office activity during the STSM was entirely conducted at the premises of CTFC in Solsona (Lleida). Here the host institution made available an office with full facilities (telephone, printer, WiFi, etc.).

The analysis of subsidies grant files was done at the premises of the Forest Office of the Generalitat de Catalunya, in Barcelona.

Interviews were conducted according to the preferences of the interviewed persons, either in public places easily accessible (bars, restaurants and forest technical schools), or at the very premises of the companies. As a geographical reference, the interviews were all conducted in the provinces of Lleida and Girona, i.e. the provinces with a higher share of mountain area and forest activities. In order to reach autonomously the different areas, the STSM holder used a rented car. It has been not possible to use cars of the CTFC for insurance limits.

4 Overview of collected data

The study is still ongoing. At the moment 7 companies were directly interviewed, the online survey received 12 fully filled questionnaires (a reminder has been sent recently) and 134 grant files out of 308 have been analyzed, completing the grants issued for the years 2007-2009.

5 Results based on the collected data

As the study is still ongoing, results are partial and some aspects cannot yet be analyzed. Anyway, from the collected data it is possible to draw the following provisional results:

- The level of mechanization of Catalan forest companies is still quite low as well as their professional skills and the level of specific training. Most companies rely on adapted agricultural tractors with winches. Small crawler tractors are still very popular among local companies and represent about 20% of the requested subsidies for the purchase of tractors (period 2007-2009). For most small-medium enterprises, forest harvesting appears to be secondary activity linked to a more general forest maintenance for public authorities (municipalities). Indeed, due to forest fire risk prevention, forest maintenance services are the backbone of commercial activities for most companies. As a proof, the most requested item in the subsidy files are forest mulchers and

hydraulic mulchers (installed on cranes, for roadside cleaning). Compared to winches, an item of similar cost and applied to the same tractors, mulchers purchased with subsidies are almost triple.



Picture 3 – Crawler agricultural tractor adapted for forest harvesting

- In spite of the general low level of specialization, few companies are investing for modernizing their fleets and, most important, for integrating more specialized equipment. The most common dedicated machine is the skidder with winch, but also forwarders are deployed by a number of companies. Exact figures are yet not available, but at least 10 small-medium forwarders are in force in 5 companies (being one very large with 7 machines of this type).
- Regarding coppice, several interesting observations are worth a description. First of all, the concept itself of coppice forest is quite vague for the operators and in several occasion the interviewed person could not understand at first what was meant with “monte bajo” (in Spanish) and “bosc de rebrot” (in Catalan). In fact it is not established at national or regional level a definition by law or technical rules, as for example in Italy, where high and coppice forests are very different types of forests, with specific management rules and the limit to turn a forest from one to the other type.
- Pure coppice forests are mostly concentrated on the coast (Barcelona and Girona) and represented by *Quercus ilex* stands. This species is very adaptable to coppice management, and its wood is the most appreciated as firewood in the local market. The most common coppice harvest system is selective cut of stems in the stumps, leading to stands of uneven-aged coppice = coppice with shoots of different ages on the same stump (usually three age classes), also called “selection coppice” a continuous cover is maintained. This type of treatment is also applied in mixed forests, very common, where selective cutting is applied both to conifers and to broadleaves (selection within the stump).

	Conifers	Broadleaves	Mixed	Total
Barcelona	226.029	115.284	128.498	469.812
Girona	90.500	143.463	131.967	365.930
Lleida	220.920	56.737	260.226	537.883
Tarragona	178.608	19.633	54.346	252.587
Cataluña	716.058	335.117	575.037	1.626.212

Table 2 – Forest area in Catalonia according to management type

- Harvesting companies fully dedicated to coppice forests are generally small to very small ones (single person company), with very low level of specialization and no specific equipment: agricultural tractor equipped with winch and in some cases with multi-purpose trailers, often without crane (some subsidies were used for installing it on used trailers). Animal extraction is still very common and several companies still keep at least one mule for some tasks, even if in complementary use with machines (e.g. concentration of logs for facilitating hauling). Firewood is processed by means of simple band saws and hydraulic wedges. It is interesting to notice that in subsidies files where the original requested machines had to be reduced in number (for a lower available budget), the company always turn down the firewood processing equipment, which thus appears to be the less important investment for these enterprises. This is confirmed by the fact that harvesting of coppice is considered marginal by most companies, which are fully oriented towards conifers for industrial use.



Figure 4 – timber yard and facilities of one interviewed company

- An important exception is represented by some of the most active companies, which are equipped for extraction and transformation of coppice products. According to the interviews, they consider it as a by-product, but also as an important service offered to forest owners. In fact, quite frequently forest parcels are a mix of conifer (dominant) and broadleaves (dominated, often from natural regeneration). Extraction and valorization of coppice provides an additional product, with a beneficial diversification for the company, and allows a complete silvicultural treatment in the whole of the forest parcel. For this purpose, at least two industrial firewood processor are operative in Catalonia. This can be the catalyst for introducing a new approach to coppice management and harvesting systems in the area. In fact, these machines maximize their productivity with logs with 3-5 meters length and variate diameter, as can be easily produced from a pure coppice or mixed forest.



Picture 1 – One of the industrial firewood processors operative in Catalonia (Pezzolato TLC 1300)

6 Conclusions

Most of forest companies in Catalonia are still applying a traditional and mostly manual work method. This holds true in any type of forest, and even more in harvesting of coppice forests, which is the main goal just for very small companies, with low professional capacity (no training) and very low investment in equipment.

Nevertheless, the presence of leading companies, which are introducing new machines, work methods, and particularly a new business approach, seems to be a potential catalyser for a general innovation of the sector. This innovation can be driven by imitation, or necessity to compete on the market, but should be directed and supported by public grants. This is an ongoing activity of the Generalitat (Regional Authority), which supports the modernization of companies and a higher level of professionalization: for instance, real forest machines are supported with a higher % of subvention than adapted tractors. This priority criterion should be maintained, possibly also identifying with more details the type of machines and work methods preferred for the desired development trend.

The study is relatively wide and time consuming, particularly for the telephone interviews and paper files analysis. For this reason, the STSM was meant to provide the basis of starting the study but not for completing. As anticipated in the work plan, thanks to a collaboration with the University of Lleida, Prof. Jesus Peman proposes this study as Master Thesis to the students of the second year of the Master of Forest Products. A student accepted the thesis and is currently carrying on the remaining part of the data collection.

7 Recommendations

Further efforts should be devoted in training, aiming at enhancing work safety and productivity, as this appears to be a topic neglected so far, but felt as important by the most active companies (which struggle to get skilled workers). The peculiar potential and management aspects of coppice, also where harvesting is involved, should be highlighted more by technicians and public authority. Possibly, also frame rules should differentiate coppice from high forest in terms of silviculture practices, harvest methods and renovation criteria.

8 Literature

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