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# Title: Fuelwood as an indicator of inconsistencies in a national forest policy: a case study in two French regions

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In France, since 2005, national energy policies have been started to promote fuelwood. The point of the paper is to investigate how fuelwood is a boundary object which forces traditional forest actors to change their management by confronting them with new actors. Three groups are involved in elaborating new policies for fuelwood: forestry, energy and territorial actors. The aim of the policies is to develop what is presented both as an opportunity to enhance harvesting economics and to develop a renewable and local energy, necessary to achieve the European Union climate and energy package targets for 2020. However, in France it appears that these actors have considerable difficulties to work together, even with the intervention of public authorities. These difficulties are reinforced by decentralization processes which had been at work for the last 25 years.

Historically centralized, forest policy has been impacted by the increasing importance given to environmental and agricultural problems, the growing power of European over national policies and the introduction of new public policy instruments. Hence, the importance of the State has been decreased and sectoral forest actors empowered. Priority was given to timber during the 19$^{th}$ and 20$^{th}$ centuries. Therefore, forest actors consider fuelwood as the ultimate promotion for wood products. To the contrary, the top-down approach of energy actors considers energy as the foremost issue, supported by national policies promoting renewable energies to meet the EU 2020 targets. The tension between these decentralization processes and the top-down approach of energy actor suggest that scale is a key issue between these actors. This issue was studied by an important geographic literature for the last 30 years (Herod, 2011).

Methodologically, the research uses semi-structured interviews conducted with different stakeholders in two French regions (Rhône-Alpes and Auvergne) and information collected in meetings of actors from local to national scale.

The paper starts with the changes implied in forest governance by the development of fuelwood. Secondly, the cohabitation between different users and different sizes of heating system is analysed, then briefly illustrated through two case studies. Finally, we discuss the importance of scale and how fuelwood highlights specific scalar structuration.

## 1 Forest and energy: towards a new governance?

### 1.1 Forest sector: what changes implied by fuelwood?

Biomass accounts for about 10% of the world energy consumption. Energy from forest areas offers the advantage of not being in competition with food uses, contrary to biofuels grown in agricultural areas.

Our work showed that three dimensions are involved at least in the development of the fuelwood sector: forest, energy and local development. Each one of these dimensions implicates different actors with different know-how and facing difficulties to work together.

### 1.1.1 History of fuelwood: from log to pellets

Historical studies on forest (Léonard 2000) showed that different uses of forest resource existed throughout history. The Middle Ages in Western Europe was a turning point with an important increase in the use of forest products. Forest was supplying both food and raw material for building and energy. Forest landscape was then more open and less dense than it is today in Western Europe. Forest was used for fruit picking or cattle feeding by peasants, and for hunting by the lords (Boutefeu 2005). The latter began to regulate forest areas by imposing rights of access.

Energy use was important too and an intensive exploitation was made of the forest, which led different government to promulgate laws in order to prevent a sufficient volume to be harvested for timber at regional and national level in the 13$^{th}$ and 14$^{th}$ centuries.

It is during the 16$^{th}$ and 17$^{th}$ centuries that the wood became prominent as energy source before being replaced by coal in the 19$^{th}$ century, then fuel and gas during the 20$^{th}$ century. In developed countries, its importance decreased in the energy mix: in France, it represented about 20% of household consumption in 1960 but only 4% in 2000. Timber gained priority over the other promotions of the resource, which it kept until now, due to its better added value.

However, fuelwood regained importance with the development of chips and pellets on the one hand, and more efficient heating systems on the other hand and in a context of reinforcement of renewable energies.

Forest sector in France is in tension and faces difficulties to rely on an abundant resource.

### 1.1.2 New uses: forest in difficulty

Concerns started to rise in the 1980s and 1990s about climate change and sustainable development, leading to a growing commitment towards renewable energies. Even if not the most broadcasted renewable energy, fuelwood is one of the most developed. In France, it is ahead of all the others for the heat, and 2$^{nd}$ for electricity behind waterpower. This is partly due to the important part of rural households still using a secondary boiler, because of the right to use municipal wood.

However, since the early 1990s, initiatives and policies have been elaborated to promote a more efficient use of fuelwood, mainly based on chips and pellets, but also on more efficient log boilers. Chimneys and classical stoves have an efficiency rate inferior to 20%, whereas new log boilers fit norms requesting an efficiency rate of 50 to 60%.

75% of the French forest is private and characterised by a majority of smallholders, 3.8 million owning 30% (Bianco 1998). The public forest is already fully harvested by the national forest office, so increasing fuelwood volumes requires harvesting private forest as shown in different scientific reports (Cemagref 2007). However, this is restrained by the important parcelling. Moreover, forest management has often been neglected by an important part of the owners: neither thinnings nor exploitation plans have been done, which implies there is no forest roads to access the forest.

## 1.2 Energy sector

The use of biomass goes along with a rising demand of energy. The world consumption was 250 million of tonne of oil equivalent (toe) at the end of the 18$^{th}$ century; it grew to 1 Gtoe by

the beginning of the 20th century and it was of 2 Gtoe in 1950. Now, at the beginning of the 21st century, it is of 12 Gtoe (Criqui 2013).

Energy and climate changes stakes are closely linked since the GHG emissions are for the most part due to the use of fossil fuels. For the last decade, international and engagements have been made. In Europe, one of the most important was the EU climate and energy package. This package was adopted by the European Parliament in December 2008 and focuses on three main targets for 2020, called "three 20 targets": an increase of 20% in renewable energy use, an increase of 20% in energy efficiency and a 20% reduction of greenhouses gases.

France's target is to reach 23% of renewable energies, whereas it was of 11.7% in 2009 (Commissariat général au développement durable 2009), whose two-third were already provided by biomass. To achieve this goal, it will be necessary to increase by 55% the volume of wood, from 38 million tons per year to 59 million.

### 1.3 Territory

Fuelwood gives the opportunity to develop local employment and to promote a local resource. At national scale it is difficult to promote rules which can adapt to different contexts (Andersson and Ostrom 2008). Hence the importance of territorial dimension was thought to be the scale where the "nestedness" of actors can be integrated with local specificities. Different tools were elaborated during the last two decades.

Among these tools were the Forest Charters for Territories, which completed different policies to promote forest set up at regional scales by the French national planning agency (DATAR). Fuelwood is presented to reduce the vulnerability at local scale.

These different aspects underline that the forest is a complex system mixing ecological, technical, social, and psychological aspects (Arnould 2002), sometimes compared to the stage of a theater because of the intertwined relationships between the actors (Boutefeu 2007). The development of fuelwood has to deal with this complexity.

It can be concluded that there is no dedicated fuelwood policy. Current policies depend on different environmental or energy policies at national scale. As an example, we previously showed how biomass was an important part in renewable energy policies, but in the same time the division of the French Agriculture Ministry was tasked to assess the biomass importance for the carbon credits system. This lack of dedicated policies impacts the coordination of the actors from the different sectors at subnational scales.

In the second part, we will focus on two case studies in order to evaluate these issues.

## 2 Co-habitation between different sizes of project

### 2.1 National project: difficulties for small plants?

From our interviews and participation in different meetings and the analysis of policies, we were able to identify three main steps in the development of fuelwood.

First, during the 1980s and the early 1990s, new heating systems were mainly set at a very local scale, in order to develop fuelwood supply chains.

Then, starting from the mid-1990s, different policies were developed to foster wood-based heating systems. These policies took place at regional scale first, with Fuelwood and Local Developments Plans held by the French governmental agency for environment and energy (ADEME). The aim of these policies was to coordinate and help the actors to launch heating systems, without granting them with incentives.

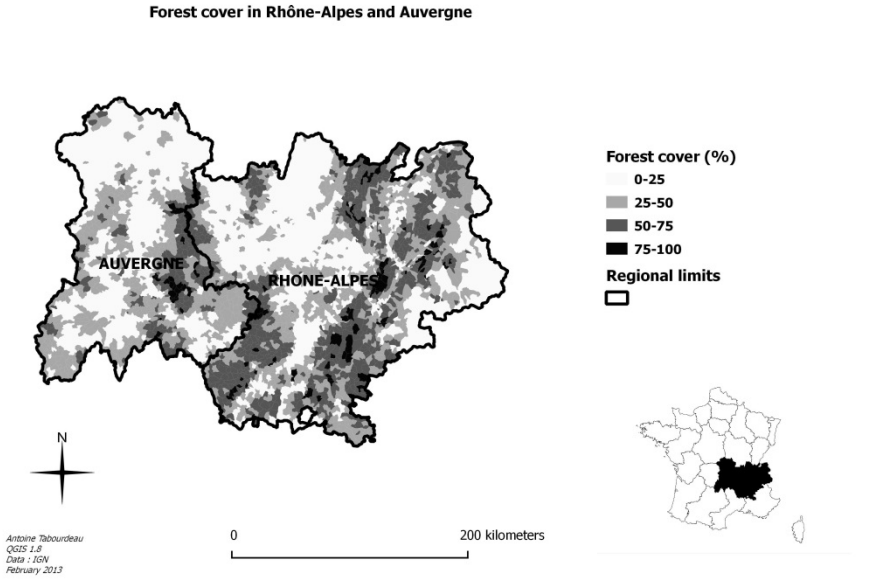
The third phase started in the mid-2000s with new policies aiming at developing renewable energies. The biomass was concerned and, considering the difficulties to access the resource with the regional and local approaches, a national plan was set in 2004 so that energy suppliers could get involved with Combined Heat and Power (CHP) projects, providing at least 2 megawatt hour (MWh). The interest of having large scale project is to allow economies of scale. The incentives for the CHP projects were based on feed-in tariffs for the electricity.

Thus, these CHP projects faced important difficulties in supplying. These issues explain that the cost of fuelwood has been underestimated by energy providers. Hence, numerous plants could not materialize. A lack of knowledge in forest management from energy providers appears to be one of the reasons why these big projects failed: as we underlined in our first part, the heterogeneity of the local contexts cannot be taken into account, hence the heterogeneity of the wood cost. Since energy providers plan 20 years investments based on a fixed cost of the resource, if this cost increases, as our interviews showed us in different cases, the cost-effectiveness of the operation is at stake. Yet, the harvesting cost claimed by the foresters are mainly based upon estimation derived from already harvested and easily-accessed areas, and not from not-yet harvested areas, hence harder to access.

It implies important uncertainties in the cost of the resource and tensions with smaller projects which aimed at using the same resource.

We will study the case of two French regions, Auvergne and Rhône-Alpes (figure 1).

**Figure 1: Auvergne and Rhone-Alpes cover forest**




## 2.2 Case study in Auvergne

Auvergne is an example of the development of small supply chains and important CHP projects. The same three steps development than previously described at national scale could have been observed, with a first step of local initiatives, then coordination in the 1990s and early 2000s and finally the apparition of national-supported projects. In Auvergne case, it is only in 2010 that four regional CHP projects have been held in national biddings.

Three kinds of supply chains have been identified: public, industrial and person directed chains (Amblard and Taverne 2010). These supply chains are assessed by a special group,

created especially for the CHP projects, called Biomass Committee. The Biomass Committee is in charge to assess the supply plan of the projects and gives a recommendation if the projects do not appear to threaten the access of other users to the resource. The Biomass Committee exists in every French region. It was a demand of the forest subdirection at the Agricultural Ministry to centralise the management of the supply issues. It includes members of regional delegations of different administration: the national agency for environment and energy (ADEME), the Food, Agriculture and Forest administration and the Regional Council. The assessment of the Biomass Committee is not based on any database but only on the expertise of each of its members. The problem is that this expertise can considerably vary from one region to the other. A second problem is the lack of integration of other region data since each Biomass Committee assesses only its own region CHP projects but the supply-chain is not restricted to the regional boundaries, so resource can be both provided from other regions and to other regions, depending on the demand. Some stakeholders would hope that a national database allowing assessing the resource and protecting smaller projects can be created. A recent national report recommends the creation of such a database.

### 2.3 Case study in Rhône-Alpes

Rhône-Alpes region is characterised by the presence of the Alpine range in the East part of the region. These specific alpine constraints highlight how intricate are the different dimensions of fuelwood. Actually, in an uneven environment, forest plays different roles, with protection and recreational functions. The literature underlines the ambivalence of the forest between the economic function and the natural patrimony (Galochet 2006) and the vulnerability to climate change (Brun 2008).

The 42% alpine forest cover is higher than the national average but the relief does not allow an easy access to the resource. New techniques are experimented like cable skidding. Unlike other alpines countries like Switzerland or Austria, patch cutting is not commonly used. However, there is a very low ratio of forest roads, due to the important number of smallholders.

The difficulties met in the Alps highlight the importance of having reliable data about the resource. A regional database is currently developed under the supervision of the national agency for environment and energy. The data provided are based on the response of the person in charge of each project, which they do not always wish to do.

The information structuration process reveals tensions not only between the different users but also between different scales.

## 3 Re-processing scales?

### 3.1 Asymmetries of information

We examined how data about wood resource is processed. This allows us to suggest that asymmetries of information between the actors could be responsible for the tensions and the failure of some projects. Indeed, different tools to provide information about the availability of the resource can be used. Thus, these tools do not provide the same accuracy of information and cannot be freely used by every actor, as shown in Table 1, either because buying the data is too expensive for some actors or because of it is kept secret by some industrial actors.

**Table 1: existing tools for assessing available volumes**

| Name | Type | Responsible | Scale | **Access** |
|---|---|---|---|---|
| National institute of geographical and forest information (IGN) | Assessment of available volumes | IGN | national | **For every user but expensive** |
| Resource study | Assessment of available volumes | Cemagref (public research institute) | national | **Free for every user** |
| Regional database | Assessment of available volumes | Regional associations and energy administration | regional | **For administration and monitoring** |
| Supply plan for CHP projects (national bid) | Assessment of available volumes and costs | Energy provider | regional | **For energy providers and administration only** |
| Territorial Supply Plan | Assessment of available volumes and costs | National Federation of Forest Municipalities | local | **Results available for every user but assessment method kept secret** |

This table underlines that sharing information about the availability of resource reveals power issues about controlling the access to the resource. The only tools shared by all the users are national and with a low accuracy. This causes tensions between users when different projects are planned in the same area. Other tensions are revealed when big projects are planned at a larger scale than others and make contracts with every provider, forcing smaller projects to pay more for the resource.

### 3.2 Scale: a key issue

These asymmetries of information stress the fact that fuelwood lacks control and monitoring from one scale to the other: the information gathered at some level, for instance by local forest or territorial actors, are not used by other actors, for instance energy actors.

Andersson and Ostrom (2008) argued that in natural resource management both highly centralized and decentralized systems are problematic. A polycentric system with higher or lower levels of governance provides institutional back-ups and reduces likelihood of perverse incentives.

Geographers worked on scale, based on Foucault's theory (Planel 2012), to show that power is not located in a place or at a given governance level. To the contrary, scale is a dynamic which organize space and is the result of the relation between the users. These processes of scalar structuration are continually reworked (Brenner 2001).

Hence, our work suggests that fuelwood is an illustration of how scalar processes play an important part in the forest management. The nestedness of forest actors with other users such as energy providers appears to be underestimated and could explain why renewable energy targets based on biomass are not achieved.

## Conclusion

This papers aims to underline that fuelwood involves difficulties regarding not only the forest sector but the energy sector and local planning too. There is no policy specifically dedicated

to the energy provided by biomass, since the different existing policies are intertwined with different administrations. In this regard, fuelwood implies different management scales

The paper evaluates how uncertainties are stressed by the lack of local data on the accessibility of wood resource whereas, at national scale, this resource is considered to be abundant. Results show that this lack was the basis for tensions between small plants often supported by local public authorities and larger projects supported by national energy groups. The arguments oppose, on the one hand, the higher greenhouse gas impacts of the larger plants, due to the transportation, and, on the other hand, the higher cost of smaller plants. The paper concludes that these differences unveil asymmetries of information between the actors at different scales. We suggest that energy transition issues can cause profound changes in governance for the forest sector and points lacks in scientific knowledge about life-cycle assessment. It is assumed that the difficulties to increase the value of the non-timber wood highlight the weaknesses of the forest sector economics.

**Bibliographic references**


Amblard, L. & M. Taverne. 2010. La filière bois-énergie en Auvergne : une typologie des chaînes d'approvisionnement. 70. Cemagref, UMR Métafort.

Andersson, K. & E. Ostrom (2008) Analyzing decentralized resource regimes from a polycentric perspective. *Policy Sciences,* 41**,** 71-93.

Arnould, P. (2002) Histoire et mémoire des aménagements forestiers. *Ingénieries,* N° spécial**,** 9-20.

Bianco, J.-L. 1998. La forêt, une chance pour la France. 121.

Boutefeu, B. (2005) L'aménagement forestier en France : à la recherche d'une gestion durable à travers l'histoire. *VertigO - la revue électronique en sciences de l'environnement*.

Boutefeu, B. 2007. Le forêt comme un théâtre ou les conditions d'une mise en scène réussie. In *UMR 5600 Environnement, ville, société*. Ecole normale supérieure.

Brenner, N. (2001) The limits to scale? Methodological reflections on scalar structuration. *Progress in Human Geography,* 24**,** 591-614.

Brun, J.-J. (2008) Alpine research today. *Journal of alpine research***,** 77-88.

Cemagref. 2007. Biomasse disponible pour de nouveaux débouchés énergétiques et industriels. Partie 1 : analyse et synthèse des études existantes recensées au niveau national., 124.

Commissariat général au développement durable. 2009. Chiffres clés de l'énergie, édition 2009.

Criqui, P. 2013. Les dynamiques mondiales de l'énergie. In *L'énergie à découvert*, eds. R. Mosseri & C. Jeandel, 19-21. CNRS Editions.

Galochet, M. 2006. *La forêt, ressource et patrimoine*. Paris: Ellipses.

Herod, A. 2011. *Scale*. New-York: Routledge.

Léonard, J.-P. (2000) Typologie exploratoire des forêts et contexte socio-économique national. *Revue Forestière Française***,** 135-144.

Planel, S. (2012) "Une petite expérience de méthode", Foucault, échelle, espace et justice à Tanger Med (Maroc). *Carnets de géographes***,** 16.