

## The approach of Model Forest in the territory of *Montagne Fiorentina*, Italy

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### Abstract

Model Forest is a voluntary association of people living together in the same territory and participating to the implementation of the sustainability of the territory itself. It can be seen as a link between the global objectives and the local actions to support social, cultural and economic development of a sustainably managed landscape in which forests are an important feature.

In 2012, the first Model Forest in Italy was recognized by the International Model Forest Network as a result of a 4-year-long process: Montagne Fiorentine Model Forest (FMMF), located in Tuscany, close to the city of Florence. Up to now the association has 86 members, joining the activities and participating to the establishing of priorities and elaborating concrete tools to achieve the FMMF's objectives.

As an example, some projects focused on increasing the use of local wood for building construction. To the aim, the strength grading of the main species growing in the FMMF territory was developed to make more efficient and convenient the production of structural products. A specific machine was implemented, that it was cheap, so suitable to the small sizes of the interested manufacturers; and, mainly, that it was portable and therefore sharable from sawmills involved in the project.

At the same time, other projects dealt with marketing the products of the local forest-wood-chain. The matching of supply and demand of products was facilitated both virtually (through a website) and physically (a real showroom); places where producers could exhibit their products and consumers could look for according to their needs. Moreover, it was defined and adopted a label to identify timber and derived products coming from the FMMF. Beyond the provenance, the label guarantees the legality (compliance of national and international laws), the environment and the forest worker safety. Specifically, new standards of forestry work have been developed through a process shared with the local companies.

*Keywords: local forest chain, shared management, forest market, structural timber*

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### Introduction, scope and main objectives

Model Forest (MF) is a concept rose in Canada starting from early 1990s, developed to combine the global view of Sustainable Forest Management (SFM) to local realities (Hall 1996, 1997). The comprehensive vision of sustainability has not a definite universal formula, since the peculiarities of environment, economy and society vary from place to place (Brand *et al.* 2002). Hence a MF aims at building a voluntary partnership of people living in the same territory with a broad range of interests and needs, working together to the implementation of the sustainability concept in their own context of forest landscape.

MFs act at local level, but share their experiences, results and knowledge with other MF projects thus accelerating the sustainability learning. To the aim, regional and international model forest networks have been established (Besseau *et al.* 2002).

In 2012, Montagne Fiorentina Model Forest (FMMF), the first Model Forest in Italy, was recognized by the International Model Forest Network as a result of a 4-year-long process and it is now part of the Mediterranean Model Forest Network (Casini *et al.* 2011).

The FMMF is a voluntary based, no profit association located in Tuscany (Fig. 1). More precisely the FMMF covers 548 km<sup>2</sup>, in the eastern part of the province of Florence; about 70% of the area is covered by forests, with a population of 64,000 inhabitants, divided in 7 municipalities. Up to now the association has 86 members (forest owners, private companies, sawmills, farmers, citizens, public bodies, research institutions, associations), joining the activities and participating to the establishing of priorities and elaborating concrete tools to achieve the FMMF's objectives. The activities focuses on several sectors: productive chains and market, environment, tourism, culture, recreation and the sharing aspects of the know-how.



**Fig. 1: Location of the Montagne Fiorentine Model Forest.**

To pursue the objectives of the MF concrete actions are crucial, thus the FMMF directed several projects. The purpose of the paper is to bring some examples of how the central themes of the MF concept were put into practice in the territory of the FMMF. In particular, projects focusing on timber management and marketing are described: actions aimed to create new tools to make more convenient the use of local timber for building construction; others wanted to implement the marketing of local forest products by means of modern instruments.

## **Methodology/approach**

### **Learning more about the territory**

To understand the dynamics of the timber sector in the territory of the FMMF and thus set up the suitable strategies to promote the local wood chain, interviews were conducted with forest owners, logging companies, sawmills, private traders and companies for secondary processing located in the area of the FMMF or in close proximity. The interviews were adapted by actor's category but generally they focused on: the profile of the actor (company dimension); description of usual processing and final products; the raw material used or traded (timber species and assortments); where they buy the raw material and where they sell the products; interest in a local market development; usefulness of "modern" strategies of marketing (website, trademark, brand).

### **New tools to make more efficient the use of local resources**

A specific action was implemented focusing on the setup of a new machine to strength grade the timber for structural uses. Since 2012, indeed, it is mandatory in Europe to strength grade the timber to be used in construction according to the Construction Product Regulation (EU No. 305/2011); this means that

the strength properties of each single timber element has to be estimated by verified methods, based on a large test campaign. Two are the strength grading methodologies: visual or machine grading. Visual grading is performed by an operator and it based on the evaluation of timber strength by their visible strength-reducing characteristics (e.g. knots); machines measures other wood properties, most commonly the dynamic modulus of elasticity (Bacher 2008). Machine grading brings with it several advantages: reduction of the operating time for grading, higher yields (fewer rejects), increased efficiency, allowing to make the most of the material in terms of quantity and quality (Nocetti *et al.* 2010). But, grading machines are often inserted in complex production lines, are fixed and have high costs. Considering the territory of the FMMF, where sawmills are small size, a portable device was conceived so that it could provide all the benefits of machine grading, giving at the same time the possibility to the companies to group together and share costs and advantages.

To achieve this goal, the Italian enterprise Microtec (<http://www.microtec.eu/en/homepage>) designed a portable device, and a comprehensive sampling of timber species was undertaken to set the machine on Italian structural timber. Totally 841 sawn timber elements were sampled comprehending the main species growing in the area: chestnut, fir, Douglas fir and black pine. Each piece was tested and the following properties were determined: bending modulus of elasticity, bending strength and wood density. Next to the mechanical tests, machine's settings were calculated based on the real mechanical properties of each species (Nocetti 2013; Brunetti *et al.* 2015a). The work followed the methodology described in the European standardization on the subject (EN 14081-2:2010).

### **Modernizing the market**

Modern instruments have been used to facilitate communication between the different actors of the forest-wood chain, connecting supply and demand of several products, from the primary ones (forests) to those with higher added value (finished products). A dedicated website was created as an innovative tool to coordinate, integrate, and connect the segments of the production chain.

In addition a real showroom was built as a promoting location, where producers could exhibit their products and consumers could look for according to their needs.

### **Giving visibility**

Finally, it was created a brand to give added value to local. The idea was to identify the timber products coming from the FMMF, but also to guaranty the respect of the basic concepts of sustainability: compliance with safety requirements, environmental protection, development of the area and material traceability.

In addition, a specific protocol was defined, developing high quality standards for forestry work. The standards were outlined with a participating process through several meetings with logging companies and all the possible stakeholders. A questionnaire was prepared that included questions about 4 main subjects: job safety, environment protection, link with the territory, professional training. The questionnaire was submitted to 30 actors (mostly logging companies), to analyze their opinion about the interest in adopting the standards and the content of the standard themselves. The answers were then elaborated and the final version of the standards was submitted to the companies for voluntary adoption. The adoption of the standards is a prerequisite to use the brand.

## **Results and discussion**

### **Survey among local actors**

Totally the interviews were 75, divided by category as showed in Table 1. The dimension of the interviewed companies resulted quite small: forest owners are mostly private (only one public owner),

with on average about 100 ha property (excluding the public owner with more than 4500 ha and one private with 2250 ha property); sawmills are mostly family-run enterprises (except one with 41 employees). This situation is well representative of the forest ownership in Italy.

Forestry production is at present mainly directed towards firewood and wood chips for energy production (about 80%), and it is sold both locally and outside the territory of FMMF: only 5% of the logging companies sells exclusively locally, 30% only outside and 65% both.

The forest species most used by the sawmills are present in quantity in the area of FMMF: mainly chestnut, but also beech, Douglas fir, followed by fir, pine and cypress. However, many sawmills buy the raw materials from other Italian regions or abroad, though they sell mostly locally or in the neighbouring regions. Also the material marketed by the interviewed traders or companies of secondary processing has predominantly external origin than the territory of the MF.

On the other hand, the interest of all the actors to the development of a local market is significant, above expectations (Table 1). Again, to the question if a brand distinguishing the products coming from the FMMF may encourage the use of local resources, many stakeholders answered positively; as well as to the benefits provided by a new website as a tool to meet new potential business partners. To the second option, however few actors were willing to contribute in terms of money (mostly the traders and the second processing through a percentage on their sales).

As a result, it is clear how the upstream sector of the supply chain is present and has space for structuring: many forest owners have interest in active management. Firewood and chips now account for the bulk of production, but the fact that most downstream actors supply from external sources leads to reflect on the necessary and possible enhancement of sawn timber production. (Torreggiani *et al.* 2014).

**Table 1: Number of interviews and percentage of positive interest as the results of the survey among local actors. Torreggiani *et al.* 2014.**

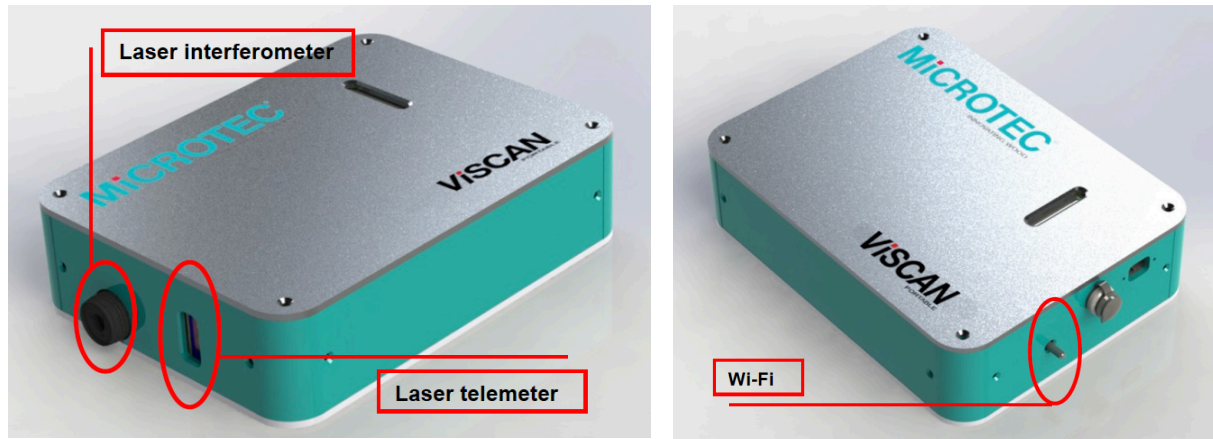
Actor category	N.	Local market (yes)	Local brand (yes)	Website interest (yes)	Website payment (yes)
Forest owner	18	69%	64%	71%	23%
Logging company	20	-*	55%	75%	25%
Sawmill	8	88%	62%	75%	38%
Trader	5	40%	80%	60%	80%
Secondary processing	24	44%	75%	79%	58%

\* Already the 72% of the logging sites are in the territory of the FMMF and the 19% in the close proximity.

### **A new portable grading machine for local structural timber**

The new grading machine was design starting from the technology ViSCAN of Microtec: the natural frequency of vibration in the longitudinal direction of a timber piece is measured by a laser interferometer and used as predictor of timber strength. This technology is part of more complex grading machines inserted in production lines, with costs definitely higher; it was transferred in a smaller machine, such as to be easily portable and therefore moveable from a production site to another. It has been called ViSCAN-portable (Fig. 2).

The machine was then set on the timber species present in the FMMF territory already used or potentially suitable for construction: ViSCAN-portable was officially certified as strength grading machine on March 2014. At the same date the settings for Douglas fir and black pine were approved, while for fir and chestnut they were approved on October 2014. So far, this is the first and only machine in Europe able to grade a hardwood.



**Fig. 2: ViSCAN-portable grading machine.**

With these results, it becomes possible to introduce the machine strength grading among small/medium sawmills. Thanks to this new opportunity the companies can enjoy advantages both in terms of quantitative yields and efficiency in the classification. On the other hand, the portability of the machine is an interesting stimulus to its possible spread: neighboring sawmill could share the purchase or lease the equipment, reducing the amount of initial investment and operating costs. This sharing mode is well suited also to a non-continuous production of lumber (Brunetti *et al.* 2015a, b).

### **Website and promoting location to stimulate the market**

The new website is at time online and can be visited at the web address: [www.legno.forestamodello.it](http://www.legno.forestamodello.it). It is structured as a shop window where the forest products can be shown and publicized. They are divided in four categories: standing trees (forest plots), firewood and logs, semi-finished and finished forest products. To each product it is assigned a specific identification code, so that the consumer can enter that code into the website's verification button and learn exactly where the wood was derived from. Naturally the website is still under construction, but it is an ongoing process and already some wood plots to be sold for logging are shown in the window.



**Fig. 3: The promoting location: ShowWood.**

In addition, a promoting location was built to exhibit and promote the forest products coming from the FMMF territory. It is called ShowWood and it is the first showroom of forest products in Italy. Sustainability was a keyword for the creation of the space, made entirely in X-Lam panels of Douglas fir grown in the FMMF area. For the design a contest of ideas was announced, open both to students and professionals. The winning project was a structure looking as a pile of logs and formed by two modules easily transportable, which can be positioned and assembled such as to create different spaces according to the needs. The inauguration ceremony took place on October 2014 (Fig.3).

Altogether, the website allows the producers in the FMMF area to know each other, but also to reach a larger audience, encouraging the beginning of new business relations. Both the website and the ShowWood constitutes new opportunities to promote local products and to stimulate the market.

## The brand

The brand “wood of the forest model” ([http://www.forestamodello.it/?page\\_id=2349](http://www.forestamodello.it/?page_id=2349)) identifies products of the FMMF. The categories of products that can be guaranteed with the brand are in fact: wood biomass for energy production (firewood, chips and pellet), logs, sawn timber and wooden finished products.

A working group composed of forest professional and experts, with the involvement of the Patent and Trademark Office of the Chamber of Commerce of Florence, worked on a specific disciplinary to define the conditions and methods of use of the brand. At the time of writing, the trademark is ready to be registered.

It will guaranty the traceability of the materials, the compliance with the laws concerning safety on workplace, regular contract of purchase and sale and environmental regulations. In addition high quality standards of work were introduced to enhance the technical skills in the area by introducing a qualification that exceeds legal requirements and allows distinguishing, in a positive sense, those who acquire it (Table 2; Magherini *et al.* 2015).

In essence, by adopting the disciplinary companies fulfill their legal obligations and have an advantage in terms of product promotion. Furthermore, to encourage companies, the main public body that manages the forest area has introduced other tangible benefits: performance reserve for companies that have adopted the standards during public auctions for forest plots. Up to now, 10 logging companies adopted the standards.

**Table 2: High quality standards for forestry work: some examples. Magherini *et al.* 2015.**

Standard	Specification
Safety on workplace	Adoption of a simplified document of risk assessment also for the companies for which it is not mandatory by law.
Environment protection	Use of low environmental impact fuel and lubricants in forest works. Logging techniques aimed at protecting habitats and facilitating the fruition of the forest by other categories.
Link with the territory	Adoption of a document certifying the origin of the timber from the FMMF to be issued to all buyers.
Training	Mandatory training courses on forestry legislation, respect of the environment and safety.

## **Conclusions/outlook**

With the establishment of the Model Forest in the territory of Montagne Fiorentina, it was possible to know better the reality and the local actors, to make them meet and discuss and to understand their opinions and their needs.

The involvement of local actors let a better understanding of the timber market trends, identifying weaknesses and strength on which it was, and still is, possible to work. As an example, it was interesting to acknowledge for the predominant production of firewood and biomass for energy from the local forests, while there exist sawmills and secondary processing companies looking for sawn timber outside the region.

Therefore, the development of machine grading for the local species suitable for structural uses was an action to make more convenient such a production. The new machine was thought to be chipper than what commonly employed in bigger companies and, above all, portable and therefore sharable by several small sawmills. It was set for the most important species growing in the area.

An example of construction made of local timber assortments has been the ShowWood, a showroom for forest products. Another one is already planned: the extension of a training centre for forest workers, for which the timber will be machine graded with ViSCAN-portable.

Beyond the new tools for production, the actors resulted extremely interested in developing the local market of forest products and expressed a very positive opinion to the involvement of “modern” instruments to stimulate new business relations. Consequently, a website was created as a virtual window, a place where the several actors (manufacturers and consumers) can sell and buy. At the same time, in the ShowWood they can find the space to exhibit physically the merchandise, advertisement and get known.

Finally, the brand can be another useful instrument to get visibility and a positive image, respecting the laws and the environment. It guaranties an awareness trade of the local products.

As conclusion, the strengthening of a local market of forest products met an impressive replay from several actors. All the results achieved during last years of activity are only at a starting point, now all these tools has to be used and their real effectiveness could be verified only in the future. A key concern still remain: will the constancy of production be an obstacle to the market development? A possible remedy to any difficulty may rise could be a space where to collect and store materials by several producers. Again a store of log or semi-finished products will be too onerous for the single company, but possible for the association.

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