



THE CATALOGUE ON BEST PRACTICES

Edited by Region Liguria



FOREST SCIENCES CENTER OF CATALONIA (CTFC)

Title: MYCOLOGICAL REGULATION AS A PAYMENT FOR ENVIRONMENTAL SERVICE

Main goals of the good practice:

- Incentive stimulation forest management and hence warrant mushrooms' conservation.

Brief description of the good practice

Forests are a source of renewable tangible resources and non tangible services. In Catalonia forest structure is the result of a strong anthropic influence, its abandonment and its consequent lack of management.

63% of Catalonian surface is covered by forest, from which 77% is privately owned. This means that the ultimate responsibility of forest management relies in private foresters. Nonetheless, forest management should guarantee the different environmental and social functions that forests provide. Society increasingly consumes these forest functions and simultaneously increases awareness of and demands on the wealth that forest functions generate.

Specifically, the weight of non-wood forest products is very important in the Mediterranean environment. Their free harvesting is very common by a large part of society. In this context, natural resources managers may need new incentives that stimulate forest management and hence warrant mushrooms' conservation. Economic instruments emerge as an interesting option that contributes to the diversification of the finance of such management.

Which stakeholders have been involved?

- Private forest owners
- local and regional policy makers
- mycological associations
- tourism sector and the general public.

How do you have involved these stakeholders?

Representatives of the above mentioned groups were invited to participate in the diverse activities SylvaMED has conducted in the region of Catalonia. It has been considered crucial the building of a joint vision, achieving a shared agreement among stakeholders. Key messages, events and communication tools have been prepared with these principles in mind.

- Target: private forest owners

Communication Tools: Field visits; articles in newspapers, websites and news; debates in media, roundtables and meetings with all the stakeholders involved; training sessions; and technical seminars. The priority has been given to an extensive and fluid communication with forest managers to show and reflect the difficulties in forestry and to establish possible solutions

Key message: Forest management largely helps in the conservation of the environmental benefits that are nowadays mainly consumed without charge. However, to manage forests financial resources are required. Given the predominant private ownership of forests in the region, they constitute the main forest stewards. There is a need of new manners to deal with these private areas that benefit certain collectives. A possible economic mechanism would be the implementation of a system of payments that benefits forest owners. The



objective is to reward the production of their forests and limit the access of pickers to the private property.

Every year, forest owners face numerous mushroom pickers that in some cases practice uncivil actions that produce, for example, road deterioration, open fences or litter. Consequently, the owner takes over many liabilities that often oblige them to contract special insurances. Owners also face profitability problems of the forest exploitation. A payment could alleviate this situation, with revenues being reinvested in the same forest, benefiting all agents.

The payment does not mean, in any case, to eliminate the “mushroom tourism”; on the contrary, it would mean a claim towards quality tourism. (make a summary max 500-800 characters)

- Target: Local and regional policy makers

Communication Tools: Field visits, articles and news in newspaper, websites and news; debates in media, roundtables and meetings with all the stakeholders involved; training sessions, and technical seminars.

Key message:

There is an increase in mushroom pickers that access to the forest and that can cause a overexploitation of the resource. There is also a potential to create local quality tourism businesses in relation to the mushroom picking activity. In addition, local forest owners need increasing financial resources to cover costs related to forest management that preserves the mushroom resource. A regulation could limit the number of pickers. In combination with a payment it could alleviate the financial situation of owners, with revenues being reinvested in the same forest. This will benefit all agents. Payments may be designed in a manner that takes into account different economic situations of pickers, as well as the traditional rights of local pickers.

There are also some challenges, for example, the costs of enforcing such a regulation. However, this is foreseen to be more intense in the first years of implementation.

- Target: mycological associations

Communication Tools: The activities implemented include: field visits; articles in newspaper, websites and news; debates in media, roundtables and meetings with all the stakeholders involved; training sessions and technical seminars.

Key message: There is an increase in mushroom pickers that access to the forest and that can cause a overexploitation of the resource. A regulation could limit the number of pickers. Its objective would be the preservation of the mycological resource.

- Target: rural tourism sector

Communication Tools: The activities implemented include: field visits; articles in newspaper, websites and news; debates in media, roundtables and meetings with all the stakeholders involved; training sessions and technical seminars.

Key message:

Mushrooms are an interesting attraction for tourism in rural areas in autumn, which is generally a low season for occupation of rural business tourism (hotels, pensions, apartments, restaurants).



However, an excess of collectors in forests may endanger the renewable cycle of mushroom production. In the last decade Catalonia has experienced a relevant increase in the picking activity.

In addition, tourism-related profits from the forest attractions do not usually reward the forest owner, unless s/he has a rural tourism business; nevertheless the management this owners implements in these plots impacts on the conservation of the mycological attraction. There is then a need to achieve agreements that imply a win-win situation for both actors.

The proposal of a regulation with a payment does not mean, in any case, to eliminate the “mushroom tourism”; on the contrary, it would mean a claim towards quality tourism. The aim is that mushroom picking becomes a new environmentally-friendly attraction.

- Target: mushroom pickers and citizens in general

Communication Tools: The activities implemented include: field visits; articles in newspaper, websites and news; debates in media, roundtables and meetings with all the stakeholders involved; training sessions and technical seminars

Key message: Most forest area in Catalonia is privately owned. The mycological resources do belong to the owner of the state. A new system for controlling the current free access to the forest is required in view of ensuring the conservation of the resource. A reward to the landowner for the resource the harvester takes home emerges as a useful instrument for the conservation of the mycological resource, given that he could better accept the access of externals and manage the forest in a manner that improves mushroom production. Local enterprises have not taken part in the process; nor have them given their opinion on a regulation with a payment. Yet, a regulation on mushroom picking could constitute the start of the creation of a guarantee label of “mushrooms from Catalonia”. This trademark may be interesting for processing firms and retailers. Such a regulation could represent the beginning of the sector regularization, provided that only pickers with a professional license would be able to trade with mushrooms.

Have you involved regional policy makers?

Regional Government of Catalonia is involved in finding solutions to the problems regarding forestry. In summer 2012 was approved a pilot plan of mushroom picking and the creation of a public price linked.

Have you individualised a kind of “payment system” for environmental services?

Yes, There have been two pilot cases of payments for mushrooms. The common idea is that pickers pay for the activity they conduct and that money rewards the forest owner to conduct certain forestry practices that maintain or improve the mushroom resource. The payment in the public forest is a single fee for mushroom picking right during the autumn season, whereas in the private forest payment assigns the right for daily harvest.

Have you individualised a kind of “compensation” for your proposed intervention?

The direct payment by the mushroom picker through a license.

Who has to pay?

The direct beneficiary of the mushroom picking activity, the picker.



Do you have an idea or the perception of the social acceptability of the payments?

The pilot case in a public forest had an internet-based questionnaire to check the acceptability among participants that paid the mushroom picking fee. Results show that the system of paid authorizations is rather accepted: 43.2% found it “good” and 37.8% “very good”. The harvesting limit of 6 kg/person/day is deemed as adequate for 59.5% of respondents. The fee amount is considered adequate for 67.6% of respondents. There is a wide support (95%) for the destination of collected funds to the management expenses of the protected area where the public forest is located, followed by earmarking those funds to fire prevention (89%). There is broad disagreement with using these funds for the general budget of the regional Agriculture and Environment department.

In the case of the private forest, the owner was in charge of collecting the payments and walking around his property during the season, in order to control possible intruders. He was collecting the opinions of pickers about their experience as being positive. He also reported about the pickers without paying as being polite and either leaving the forest or paying the fee.

Is there a methodology to calculate the payment or the compensation?

To establish the payment experts were consulted and references of similar schemes in other nearby areas and the valuation study of Martínez de Aragón et al (2010)¹ were taken into account. According to that study, the minimum value of the recreation activity amounted to around 30 EUR/person/day in 2001-2003. With this reference in mind, it is acknowledged that introducing a price will reduce the consumer surplus. The aim is to capture part of that consumer surplus while also offering other benefits. Experts suggested for the public forest area a differential treatment to local inhabitants in terms of fee amount, with the aim of increasing acceptance of the payment. In the private area, the criteria of the forest owner jointly with the agreement of other agents defined the picking fee.

Is this system sustainable (in time)? If Yes, give a list of the elements that you consider important in order to make the process sustainable

The proposed scheme is foreseen to be sustainable in time. In the first years, extra efforts will be required, mainly for surveillance system. Society is expected to adapt relatively quick to this redistribution of rights and will internalize the concept of mushroom regulation and Payment for Environmental Services, in a similar sense than for fishing, hunting or truffle harvesting.

Is the process transferable to another area?

A legislation that considers the mycological exploitation by forest owners, being public or private, would be desirable for the entire Catalonia. Later, the implementation of mushroom harvesting limitations and a possible payment would rely in the decision of the forest owner, who would be protected by a law that is nowadays inexistent,

Which are the problems to be solved?

The main goal of the payment scheme is to avoid the overexploitation of the mycological resource and solve the problems that forest owners face with the uncontrolled mushroom harvesting.

Moreover, the revenues produced by a payment scheme aims at overcoming the lack of financial resources to manage the conservation of natural resources.

¹ Martínez de Aragón, J., Riera, P., Giergiczny, M., & Colinas, C. (2011). Value of wild mushroom picking as an environmental service. *Forest Policy and Economics*, 1–6.



Which are the successful results?

There are three main results. First, the development of parameters for optimization of the forest management and restrictions to harvesting that avoid the overexploitation of the resource (species limitations, harvesting amounts and frequency, best practices guide...). Second, a legislation that includes harvesting and rights of landowners that prevent non-allowed practices. And third, the implementation of a new economic mechanism that benefits both the provider of the environmental service (mushrooms) and the users (pickers).

Which are the threats?

The system faces two main threats: the first is the low definition by the payment scheme management on the final allocation of income generated by the fees; the second is the high cost of surveillance, primarily in the first years of implementation.

Which are the opportunities?

The main opportunity this system brings along is the raise of income to be devoted to forest management, and hence to more and improved environmental conservation.

Second is job creation in the mycological sector.

Third, it orders a traditionally uncontrolled practice.

Lastly, it communicates to society the non-timber values of private and public forest properties and their environmental functions.

FOREST OWNERSHIP CENTER OF CATALONIA

Title: APPLYING A SYSTEM OF PAYMENT FOR ENVIRONMENTAL SERVICES IN RELATION TO FORESTS AND WATER IN CATALONIA

Main goals of the good practice:

- developing a pilot action on the establishment of mechanisms of PES, related delivery service and water regulation (quality and quantity) that provides forest management

Brief description of the good practice

It is known that, compared with other land uses, forest contribute to the good regulation of the water cycle. For this reason, the Forestry Ownership Centre (CPF) was achieved the goal of developing a pilot action on the establishment of mechanisms of PES, related delivery service and water regulation (quality and quantity) that provides forest management.

In the Mediterranean area, especially in Catalonia, *Pinus halepensis* and *Quercus ilex* are strongly represented and grow in environments with limited water. In order to know the efficiency in water use and the contribution to the flow of these species under different treatments and conditions applied the simulator GOTILWA + (CREAF, 2009) in some real plots (oak in the forest Poblet and Montseny, and Aleppo pine in Montmell, in the provinces of Tarragona and Girona) on which simulate different managements. Simulated treatments that gave better results in efficient use of water were applied in selected forests. The actual implementation of more efficient models allowed acquiring a working knowledge of the application of technical criteria defined in the theoretical models and it has permitted to obtain real data of work costs.

We performed a study of the possible mechanisms for implementing a system of payment for environmental services by forests and water in Catalonia. We worked on four possible scenarios: basins where water is used for consumption, basins where water is used for bottled mineral water, areas contaminated and a general case, when the beneficiaries are more widespread and the service is higher contribution to the flow and/or better water quality. For each scenario we identify the main actors involved, their reasons for participating in the system and options for transmitting a PES system from the analysis of the current legal framework.

What stakeholders have been involved?

Forestry owners, research centers, government agencies, local enterprises, local forestry policy makers, associations.

How do you have involved these stakeholders?

- Target: forestry owners.

Communication Tools: The contact took place mainly through forestry associations like the Owners Association of Montseny and Forest Owners Association of Tarragona. We made also on site visits, round tables, articles, etc...

Key message: There is a close relationship between forests and water. Management of Aleppo pine forests improves the efficient use of water. In some areas and for some species, can be established offs to the owners that can set the application of "forestry for water management."

- Target: enterprises (scientists, workers forestalls)

Communication Tools: meetings, on site visits, round tables.

Key message:

There is a close relationship between forests and water.



Management of Aleppo pine forests improves the efficient use of water.

The application of a particular forest management can be positive for the company.

- Target: other forestry Catalan entities

Communication Tools: articles and conferences

Key message:

There is a close relationship between forests and water.

Management of Aleppo pine forests improves the efficient use of water.

In some areas and for some species, can be established offs to the owners that can set the application of "forestry for water management."

The application of a particular forest management can be positive for the company.

Have you involved regional policy makers?

- Target: policy makers

Communication Tools: meetings, round tables

Key message:

There is a close relationship between forests and water.

Management of Aleppo pine forests improves the efficient use of water.

In some areas and for some species, can be established offs to the owners that can set the application of "forestry for water management."

Opportunity to share knowledge and work together

Public entities are the more interesting actor to act as an intermediary in the implementation of PES.

Public entities can also be direct buyers of services.

Have you individualised a kind of "payment system" for environmental services?

It's possible to set two types of systems:

- Management Agreements (or degrees of conservation) between private enterprises and forest owners willing to apply a specific forestry.
- Agreements or subsidized by the government.

Have you individualised a kind of "compensation" for your proposed intervention?

The main ways that could fund a public PES-water and forests are (Puig et Freire, 2012):

- Items of public budgets: considering that the maintenance and enhancement of environmental services provides benefits to all of society.
- Environmental taxes: this option would be to use environmental taxes (which can not be related to environmental service) to pay the supplier. These taxes could be news or it is possible to reform existing taxes.
- Specific taxes on users: involves the application of a specific tax to the beneficiaries of the service that accrues to the owners. To apply this case the beneficiaries are to be clearly identifiable. Some taxes of this type that could be used in Catalonia are:



For basins where water is used for consumption: Water tax.

For basins where water is used to bottled mineral water: Tax packaging companies.
Contaminated catchments: Water tax.

- Tax Deductions: for environmental services providers.

Who has to pay or to compensate?

Enterprises, regional policy makers, consumers, society ...

Do you have an idea or the perception of the social acceptability of the payments?

In general, PES impose costs associated with improvements in the provision of environmental services for the direct users of these services or the government, while traditional policies based on the law mean that the costs are dependent on the forest owners and forest managers (Prokofiev *et al.*, pending publication). In this sense, it has aroused considerable interest in relation to the PES, both from the political and citizens.

Is there a methodology to calculate the payment or the compensation?

Several studies indicate that the majority of respondents supported the introduction of a fee for collecting mushrooms (Prokofiev *et al.*, pending publication) and many (34%) opt for the direct regulation to compensate property (Martínez de Aragón and Riera, 2007). In the case of a proposed payment for services resulting from forest management in Aleppo pine (level of biodiversity, availability of forest for recreational use, CO2 fixation and possible decrease in area burned in case of fire) seen that the response was very influenced by the socioeconomic status of respondents, and this suggests that the result was affected by the current economic and social crisis (Varela *et al.*, pending publication). The vision of the owners about PES: its shows a preference for applying voluntary instruments of participation in order to avoid citizens negative reactions (Górriz *et al.*, pending publication).

Is this system sustainable (in time)? If Yes, give a list of the elements that you consider important in order to make the process sustainable

The application of PES about forests and water is a difficult task: first, potential buyers (consumers, bottlers, society ...) until now have enjoyed free service and, secondly, the relationship between forest management and environmental services, are difficult to demonstrate. Therefore it is estimated that for the system to be sustainable we need to increase the studies on the relationship between forests and water, and especially get the involvement of all stakeholders.

Is the process transferable to another area?

The process can be adapted to other areas that have particular characteristics (basins where water is used by consumes, basins where the water is bottled or contaminated sites) and only in the case that there were studies that corroborate the existence of certain forest management practices that contribute to the supply of an environmental services related to water, and that those involved are willing to talk.

What are the problems to be solved in future?

- Give real values of the benefits of forest management on water quality and quantity for different species.
- What potential buyers assume the need to pay for services provided by forests in relation to the water.

What are the successful results?

1. Based on the SylvaMED studies can be considered different financing opportunities (public and private) of implement a PES system on forests and water.



2. It's possible to think of the definition of a "forestry for water saving", at least for certain species and in certain soil and climate conditions. It has been shown that, at least in Aleppo pine under limited precipitation conditions, the management application and, in particular, the implementation of a regular pattern of short rotation can increase up to 34% water provided to flow, decrease to 14% water transpired and increase effectiveness in water consumption for the production of wood up to 74% (Nadal-Sala *et al*, 2012).
3. Thanks to all the information obtained during the project has made a significant disclosure of different aspects related to the implementation of an environmental service and how to finance it. Also there have been several publications and technical seminars on the relationship forests and water.

What are the threats?

- There is not a legal regional framework about PES.
- To ensure the involvement of all stakeholders.
- Lack of studies on services and their relation to payment systems.

What are the opportunities?

- The European forest policy clearly supports the PES about forests and water.
- Depending on the climate change projections maintenance services offered by forests is at risk - and therefore must act to keep them - while the water will become an even more scarce resource in the Mediterranean, resulting in competition between different land uses.
- Whenever there is a higher concern for water supply in the Mediterranean.

REGIONAL FOREST OWNERSHIP CENTRE OF PACA

Title: HOW TO GET PAYMENT FOR ENVIRONMENTAL SERVICES (PES) ABOUT SERVICES PROVIDED BY FORESTS TO THE WATER CYCLE

Main goals of the good practice:

- have a method to evaluate the forest watershed vulnerability to hydric erosion and to turbidity
- Protect wetlands in private forests
- Protection of water catchments

Brief description of the good practice

1. Vulnerability to erosion (Siagne, Var and Alpes-Maritimes). The aim was to have a method to evaluate the forest watershed vulnerability to hydric erosion and to turbidity. It shows the positive impact of the forest at the involved stakeholders in a river management plan. The method uses a model (GIS), which produces forest watershed global vulnerability to erosion according to the kind of forest stands. The modeling of forest loss, by simulating a fire, a disease, the drought or an overexploitation, shows concretely the high vulnerability to erosion and the appearance of turbidity in the concerned areas.
2. Wetlands (Verdon). There are a lot of wetlands in private forests, so we worked in partnership with the Verdon Natural Regional Park which is in charge to protect these. The private forests' owners have been met to better know their practices and to inform them of the importance to conserve these spaces which play a role in water storage and have a very high biodiversity. This action will be presented to the Water Regional Agency, Public Body, which receives taxes collected on water consumers, and which uses a part of these money at the upkeep and the good management of wetlands. Water quality (city of Gap). For the city of Gap, we have written a forest management plan for immediate and inner protection zones of 6 water catchments, involving 21 forest owners on 12 hectares. We have met these owners to better know their uses and their objectives. The municipality is ready to take into account the forest management by respecting the owners' uses and by assuming financially the help at the management and the possible overcosts.

What stakeholders have been involved?

- Forestry owners
- local enterprises
- local policy makers (Municipalities mayors or councillors)
- associations
- Center for information, Education

Details of different public stakeholders which we have dealt with.

To involve some public collectivities, we took advantage of different opportunities: the study of a river management plan, an inventory, a setting up of water catchment:

- **In the project "Vulnerability to erosion" we worked with a syndicate from the Haute Siagne (Syndicat Interdépartemental et Intercommunal à Vocation Unique). This organism will have to realize, during 4-5 years, the water management plan (Schéma d'aménagement et de gestion de l'eau in French) by coordinating the different studies and by animating the local water commission in which the foresters have just got a seat.**



- Some members of this commission have already been informed: State representative, the national forests agency (ONF), a mayor who is the president of a body of protection against flood.
- In the project “Wetlands” we worked with the Verdon Natural Park which is in charge to conserve the wetlands. We will contact the person in charge of wetlands at the Water Regional Agency. This Agency has financial means to act because of water taxes.
- In the project “Water quality”, we worked with the city of Gap, which deals itself with the water supply and is in charge to assure the quality of drinking water from catchments.

How do you have involved these stakeholders?

- Target: forestry owners

Communication Tools: articles in forestry newspapers, websites, explanatory notes, computer models, contacts’ list, investigations.

Key messages:

- On your properties, some stakes are of community interest. That can concern 4 aspects about water cycle: quality, quantity, role about the erosion and the turbidity and environmental impact (wetlands and riparian vegetation):
- Learn how to show these stakes to the concerned authorities (Locate these wetlands, a part of your forest that plays a role on the vulnerability to erosion and to turbidity, water catchments, ...)
- Take an advice in order to apply an appropriate management.
- Program your interventions according to a management plan which will be implemented to take into account all the stakes
- Try to estimate overcosts and loss of incomes.
- Search technical and financial supports from public authorities or private beneficiaries in order to apply it
- The stakes go often over the properties limits, thus study the possibility to act together with your neighbours.

- Target: enterprises

Communication Tools: Focus groups, meetings (one to one), information during the professional forest meetings about interest of the PES.

Key message:

For drinking water producers:

You are a water customer and thus you are a beneficiary of services provided by forest on the water cycle. But in a Mediterranean context, these services depend on an appropriate forests management. The forester surface can decline because of overexploitation, fires, drought or diseases. You will be well-advised to support the owners’ initiatives and management who want to preserve their forestry heritage against these threats. PES are not always and only a money issue. They can encourage foresters to practice a better multifunctional management, and water stakeholders can save money and benefit from additional guarantees on the good functioning of the water cycle.

For wood professionals:



Be able, during wood exploitations, to adapt your practices in order to conserve those services which are more and more appreciated by the society, otherwise the owners and others stakeholders will be opposed to next wood cuts.

- Target: policy makers (local, regional and national level...)

Communication Tools: Meetings (one to one), on site visits, round.

Enjoy the opportunities given by the establishment of the local strategies by preparing complete and developed file showing the forest role and consequences of forest disappearance. At a State Level, forest owners, water stakeholders and wood producers have to organize together their practices to optimize the management of these two essential resources for human society, the forest and the water.

Policy makers have to understand that services which are provided by forests at present can disappear to-morrow in a Mediterranean context. The present balance can be broken by a fire, a drought, a disease or over logging due, for example, to biomass energy needs. Thus, forests have to be managed and preserved and foresters have to be helped to do this.

To guarantee on the long range the provided service, and even in order to improve it, Public power must involve itself beside forest owners who are on their forest parcels the true management actors.

PES implementation is important for forest owners. The weak incomes from forest areas can stimulate their owners to replace them by other soil occupations which will be less protective. In order to make forest private owners and managers able act specifically in favor of water, there is an urgent need to implement payment for environmental services.

Have you individualised a kind of “payment system” for environmental services?

We found a kind of “payment system” for environmental services which amazingly haven't been recognized like that. The beneficiary pays a part of the cost of the prevention against the fire of the forest located around the lake which provides drinkable water.

Have you individualised a kind of “compensation” for your proposed intervention?

We have carried out different studies to show the role of the forest in order to be able to obtain some kind of "compensation". Considering wetlands, the idea is that forest owners can be helped for a good management. Considering erosion and turbidity, the aim is to obtain some measures for the thinning and the exploitation of forest stands so that to find a winner-winner deal between forest owners and local stakeholders. These measures have to be studied in each case.

Who has to pay or to compensate?

A syndicate in charge of drinking water supply for the cities in Saint Tropez gulf pays. In fact, a part of drinking water which supplies Saint Tropez gulf comes from the artificial lake La Verne, surrounded by wooded slopes. A study showed that, in this area where the fire risk is very high, the quality of water would be very threatened and the consequences could be an increase of water output, in case of floods, a superficial streaming, an accumulation of thin silts, a chemical pollution from ashes, the deterioration of water quality during at least two years, ...

For these reasons the syndicate of waters confirmed its participation.

Is there a methodology to calculate the payment or the compensation?

The syndicate in charge of drinking water supply for the cities in Saint Tropez gulf had paid 50.000€ (6,25€/ha/year) in a first four years contract, following by another one of 72.400€ (9€/ha/year). These sums are used to finance maintenance works in the frame of prevention against forest fires, in forest located



along the slopes. The sum fits the part of self-financing that the cities around should have to bring. A sheet can be loaded on the website:

http://www.ofme.org/crpf/documents/doc/20110317_foreteau_protection_maures_FR&eng.pdf

Do you have an idea on the perception of the social acceptability of the payments?

Water stakeholders and also local stakeholders have no expectations about forest and, at present, there are very few exploitations done in forest (thus, threats are very limited). In those conditions, it seems difficult to ask them to pay for a service they have for free, now.

Is this PES sustainable?

The fact that a second contract has been signed shows the sustainability of this payment. The means to fight against the fire have to continue to be efficient. But a large scale fire, in some very unfavorable climate condition, is still to fear.

Is the process transferable to another area?

This PES isn't really transferable because the others lakes, where drinking water is taken off, are supplied permanently by streams. So the fires do not have a high incidence.

However, this example is interesting to illustrate how to build a PES. Before writing a PES, a technical and economic study which shows the supplied service by the forest and the economic advantages has to be carried out. Thus, most of the time, a financial investment is necessary.

This PES is showing also that the maintenance of this service provided by the forest, in a context which can be dangerous for the forest, can be considered like an additional factor by a beneficiary; thus, the payment for the forest maintenance can be paid.

What are the problems to be solved in future?

- Incomplete knowledge: The forest owners and their foresters have an incomplete knowledge about services provided by the forest as we recorded it during a pilot about wetlands. They ignore the functioning and the role of these very useful natural spaces, especially when we talk about hydrology and environment. Foresters mustn't talk about generalities, but must bring tangible elements to potential beneficiaries.
- Grouping of owners: The services given by the forest go further than the property's limits. In several cases, the owners who want to benefit of compensations would have to structure themselves in management unities. By sharing their means and managements, they could pass contracts with beneficiaries. But the formation of these unities will not be spontaneous, most of the time; we need to prepare these approaches through animation means. It would be relevant to plan that the future forest management will be delegated at a contractor capable of assuring concretely this management. Costs of animation means have to be taken into account.
- Awareness about the concept: The concept of PES is badly known also by beneficiaries. Most of them do not understand why they will pay for a service they have for free at present. So we need to demonstrate the service thanks to studies and see how a forest management extra (additionality) can be brought in order to justify a payment. These studies can also indicate the technical ways to guarantee the existence of the forest and the maintenance of these services (e.g. a forest management in favour of the prevention against fire). Thus, in a first time, it is important to have financings to command these studies.

What are the successful results?

- Good welcome by the water stakeholders: These stakeholders do not know the forest and its actors but they enjoy the process which involves a more global management because it is generally more

efficient and better accepted by the stakeholders. E.g., we detected very well that fact when we have proposed to the drinking water managers of the city of Gap a forest management plan on catchment areas. After having met forest owners, we exposed to Gap's agents their uses and practices. Simple contracts will be found avoiding the regulatory way and the expropriation.

- Work on several stakes: The pilot actions showed the interest of a multifunctional approach of these services given by the forest. We have often been solicited about only one aspect of the connection between forest and water: quality or quantity or erosion or wetland. It seems better to consider the whole roles and to evaluate them globally in order to show a more exhaustive role of the forest in relation with water. The same approach has to be followed concerning the others services that the forest provides: tourism, productions of non-wood products, biodiversity, ... It could be possible to reach a contribution more relevant of a greater number of beneficiaries.
- Implementation of cartographic models: To show the beneficial role of the forest, we need to use methods based on cartographic models (GIS). We have implemented one of them to show the watershed sensibility of the Siagne river to erosion according to the forest stands. This model allows to simulate forest disappearance and to see what can be the consequences. The modelling also allows the geographic superposition of others stakes (fight against fire, landscape,...) to reach a multifunctional management and possibly a distribution between the beneficiaries of the costs for all the provided services.

What are the threats?

- The legislative way: When a service is provided by the forest, the public administrations can be more attracted by forcing the owners thanks to rules and laws, without payments. In reality, these rules are difficult to make them apply and they often are few efficient.
- Public purchases: The public administrations and elected people are systematically more attracted by acquiring forested spaces where there are a lot of services provided than by contracting with space's owners. But, it is an important spending for the public financing and this purchase by the community does not resolve specific management's problems, because issues have always to be supported by the public financing. It is often more rational to contract with the owners and to share these issues with them in the frame of a contract. That is why in the key messages toward the public power, we communicated about our preference for a multifunctional management based on a project.
- Threatening Creditor: Otherwise, we want to warn the owners to not adopt an attitude of "threatening creditor" who will say "you don't compensate me as I wish, so I decide to practice the forest management I want even if it is not adapted to the local stakes". This choice will give to the government arguments to increase the rules and the expropriations.

What are the opportunities?

- Policies favouring multifunctionality: New policies are more and more in favour of multifunction and they encourage a multifunctional management. That is an advantage for Mediterranean forest because it will be the opportunity to show the whole roles that forest plays.
- Payment of Environmental Services (PES) are important for a better forest owners' participation: If we want that owners and managers act specifically in favour of water, we need to establish quickly systems of Payment of Environmental Services (PES). To guarantee on the long term the service given (and why not to improve it?), the community has to involve itself, beside the owners who are the real stakeholders in their wooded plots.
- Climate changes have to be taken into account: The Mediterranean actors have to understand that the services given by the forest today can disappear tomorrow. The actual balance can disappear



because of a fire, a drought, a disease or an overexploitation, for example in case of needs in biomass. The low incomes of Mediterranean wooded spaces can persuade owners to replace them by others land covers, less protective.

- That's why the Mediterranean foresters have to pursue the studies showing concretely the services given by the forest.

REGIONAL FOREST OWNERSHIP CENTRE OF LANGUEDOC - ROUSSILLON

Title: PAYMENT FOR ENVIRONMENTAL SERVICE TO SUPPORT PUBLIC RECREATION IN PRIVATE FORESTS

Main goals of the good practice:

- To find technical and financial terms so that the social function of forest is accepted by private owners and integrated in their forest management
- To make aware potential stakeholders like local authorities, tourism and recreation actors, natural space users ... to the urgent necessity of their involvement with PES
- To support and stimulate a sustainable management of Mediterranean private forests with gratitude of their functions and services.

Brief description of the good practice

In some forest countries near listed sites, touristic areas, on the outskirts of cities, public frequenting can be important: all sorts of activities that can generate degradations, conflicts with management acts, and that can threaten survival of natural habitat. The control of those frequentations is an essential condition for preservation and management of Mediterranean forests : the pilot site in the Narbonnaise Natural Park has been choose because of a very touristic country (near Narbonne city and seaside).

In private forest, means of policy are generally absents and owners are powerless with misused behaviours, degradations and robberies, when they occur. Those facts can generate a real discouragement for manage forest, or a closedown of their property. There's of course many anxiety towards their responsibility in case of accident. It's essential, and urgent in some countries, to help private forest owners taking on this social function for equilibrium and health of population : study propositions have be done to forest owners in Natural Park of the Narbonnaise, to treat anarchic frequenting and degradations, and to approach the opening of forest positively.

Local authorities and tourism actors don't know how to concert with private owners. They try to bypass private properties in their projects or use agreement for way and civil liability. Most of activities take place without information and consent of the forest owner, and of course without remuneration. Consequences of those activities on natural habitat and on others uses are ignored. The principle of dialogue and partnership between activities organizers, local authorities that are in charge with spare time needs, and forest owners, must start : steps adopted on the 3 pilot sites (Natural Park of the Narbonnaise –Aude-, Canigou mountain (Pyrénées orientales) and Lamalou les Bains country (Hérault) were to call them out to found possible convergences between their own aims and the means to realize them.

For people at last , “nature belong to everybody” and their need of nature has no frontier. Citizens don't know nature very well and many of them don't realize the consequences of their degradations on the survival of fauna and flora.

Efforts of information and awareness of public must carry on, especially about private forest management knowledge, rules for a good behaviour in natural habitat and own contribution for their safeguarding : so, how chose procedures for a good control, in order to the good messages are understood ? a “multi pass card” has been proposed in the pilot site of Lamalou les Bains.

We wished that the methodology use is fully integrated in wider concerns of sustainable development of forests : setting up PES can help the economy of management for low yield forest and their prevention against fire (as in the pilot site of natural park of Narbonnaise) ; she also can be an asset for economic



development, with a high contribution of forest property for local touristic activities (as in the pilot site of Canigou mountain).

Which stakeholders have been involved?

- Private forest owners
- local and departmental policy makers
- Environmental partners
- tourism sector.

How do you have involved these stakeholders?

With this sensitive file that is the public frequenting in private forests, we first choose with all stakeholders speech exchanges during meetings.

- Target: private forest owners

Communication Tools:

- articles in CRPF paper, which is sent to more than 10 ha forest owners – web site : the aim is to give us information and possibility to contact us for asking or showing (but we had not very much contact in result)
- letters to inform and to invite forest owners which specified in their management plan public activities or frequenting in their forest
- meetings with experiences accounts of frequenting, of payment setting up, of activities development in private forests
- Round tables and meetings with forest owners and partners: some controversies but above all discussions about constructive outlook and possible way to do them.
- A call to participation and forest view with owners that answered positively : diagnosis and project draft to get the better of public frequenting and welcome in their forest

Key message:

- To understand the difficulty of forest owners with public frequenting in their forest
- To find solutions to control it with respectful and durable terms
- Being against public frequenting is not always easy and efficient
- Doing nothing to treat the problems can lead to disasters, for natural habitat or for people security
- The required answers must really take into account that people welcomes, when they are free, are social functions with collective concern, and not products for owners : they haven't to cost them amount and threats for forest, and must opposite give rise to gratitude and respect.
- Project about people opening forest with PES measure has to show its collective concern and its convergence with aims of associate stakeholders ; private owners and partners have to share their review and built together collective project.

- Target: Local and departmental policy makers

Communication Tools:

- articles in CRPF paper, which is also sent to local elected officials and partners

- information on the website of CRPF
- Meeting with “Natural habitat” office and “People activities in natural spaces” services
- Conference during a training journey for local elected in Gard department, about PSE concept for social uses
- Presentations in local committee about sustainable touristic development in forest country (organized by the public establishment “Pays Pyrénées méditerranée” on [Canigou Mountain](#))

Key message:

- Problems met by owners become in some countries a real collective concern subject
 - Partnerships are possible with private forest owners to meet needs of those targets
- Target: Naturel Park, nature associations

Communication Tools: field visits; reports about the subject; roundtables and meetings with all the stakeholders involved; training sessions

Key message: preservation of environmental stakes and people information can take place in forest by partnership with private forest owners; it’s essential for sustainable tourism to internalize this aim.

- Target: rural tourism sector

Communication Tools: field visits; articles in newspaper, websites and news; debates in media, roundtables and meetings with all the stakeholders involved

Key message:

Some pilot initiatives show the interest of tourism in forest in rural countries, but its development must fully include private forest : to be durable, it must take account of concerns not only for local economy (trades and hotel trade), but also for forest management itself : development, preservation, diversification of forest incomes ...

In the areas where forest management is not easy, non-productive and fragile, the development of a sustainable tourism in forest can be determining for its survival: this feed-back must be the key point of those plans.

- Target : citizens (not yet realized but planning)

Communication Tools: information brochures; notices boards; field visits; articles in newspaper, websites and news.

Key message:

- Private owners choose to open their forest to people : it’s the opportunity to each other to discover forest management in private forest ; enjoying those spaces require having a citizen’s behaviour

Have you involved regional policy makers?

An approach with them will be engaged from pilot sites experimentations, in order to a wider development in region.

Have you individualised a kind of “payment system” for environmental services?

We worked about 3 types of PES :



- 1/ a complete payment for a social function with collective concern given by private forest
- 2/ help for emergence and durable development of recreation facilities in private forest
- 3/ the setting up for a " multi-pass card", i.e. a sort of right of use in private forest

Have you individualised a kind of "compensation" for your proposed intervention?

Every plan require preliminary study and local demonstration in order to mobilize owners and stakeholders for interesting aims. This work, realized on pilot sites with Sylvamed means, must be fully include in PES for new project.

Who has to pay or compensate?

System 1: local authorities

System 2: local authorities, but also tourism stakeholders and professionals, and perhaps tourist people with touristic tax (which exist in French touristic localities)

System 3: associations, citizens

Do you have an idea or the perception of the social acceptability of the payments?

Works in pilot sites show that the number 1PES type (paid by local authorities) is the more accepted, as soon as aims have collective concerns and tend towards with leisure expectations in forest.

In pilot site of Lamalou les Bains, the Carte pass conception is more difficult to be accepted, because of it's not very popular. It's probably a number 1PES Type that will be suggest.

However, the number 2 PES system is also well accepted because it can create economic activities in parallel : it's more complicated to put in, and we only outlined it in Sylvamed project.

Is there a methodology to calculate the payment or the compensation?

We choose to provide an estimate which contain all expenditures of organization, functioning, surveillance ... necessary for a sustainable forest opening installation but also for the continuous follow-up.

Is this system sustainable (in time)? If Yes, give a list of the elements that you consider important in order to make the process sustainable

Sustainability is a fundamental preoccupation which is the central point of the project from the beginning and during discussions with stakeholders.

Elements noted in pilot sites experimentations are :

- Definition of follow-up indicators according to all partners
- Control of frequenting : a people flow suitable with private property and environmental preservation
- Damage control, repairing if it'll occur, adaptation for not let it happen again
- Adjusted conventions for coordinate different uses and rights, which describe roles and responsibilities
- A regular assessment done with all partners, technical and economical one.

Is the process transferable to another area?

Yes

Which are the problems to be solved?

Local authorities are reserved with PES, they would like to conserve a self-financing, like for subventions.

Which are the successful results?

1/ Several forest owners positively answered to sylvamed project for forest opened to people and partnership with local authorities

2/ Local authorities appeared interesting by this proposition contracting with forest owners, even if they never did it before, interesting by constructive and sustainable projects, and also according to PES setting-up.

3/ Forest owners want to group together in order to being well identified by local authorities for those aims : one association is yet created in Hérault, and one is perhaps planed on Narbonnaise area.

Which are the threats?

Difficulty to control people flow and not respectful behaviour

Which are the opportunities?

- Limiting unauthorized occupations and damages, helping owners for resolving them
- Developing forest properties with its environmental and patrimonial qualities, its landscapes, ... and encourage owners to manage their forest, even if they product not much of wood
- Creating synergies with others managing preoccupations, like protection against fire, setting-up local economical circuits, development of diversification incomes ...
- Grouping owners and setting up dialogues, partnerships with tourism and leisure professionals

ENVIRONMENTAL DEPARTMENT OF LIGURIA REGION

Title: FORESTRY MANAGEMENT FOR THE PREVENTION OF HYDROGEOLOGIC RISK

Main goals of the good practice:

- Reducing hydrological and geomorphological risks
- Increasing the value of the wood (finding benefits for forest owners) , creating a short wood chain with local uses (little biomass energy plants, wood products, ecc)
- To explain – to citizens and stakeholders – the benefits, social uses and environmental services of forests in critical areas from the hydrogeologic point of view

Brief description of the good practice

A Pilot Action on the territory has been planned, in a specific study area.

The study area is located in Polcevera Valley, right behind the city of Genoa and comprehend three Municipalities: Ceranesi, Mignanego and Campomorone. The zone has been chosen for this main regions:

- is located quite near the urban area of Genoa;
- the forestry coverage is very extensive;
- there are many diffuse problematic situations, like hydrogeological risks and soil slips and also many anthropic elements exposed to these risks.

In this area the following actions had been realized:

- studies and surveys: geological and forestry studies on particular portion of the territory, which nowadays are abandoned and present consistent hydrogeological risks; property survey about the studied areas, in order to involve a large number of owners and create working tools for solving the problem and realize a correct management of the territory;
- governance activities: 6 meetings with public administrators and technicians of Liguria Region and the involved Municipalities; 5 meetings with private owners, Municipalities, forestry companies and operators, for working all together at the creation of efficient working tools, which could demonstrate the effectiveness of correct management of forestry resources (also in degraded and abandoned suburban areas) and creating an economically-sustainable wood-chain;
- analysis of the costs and benefit of local supply chain of wood and a study about a possible PES of the use of wood in areas characterized by hydrogeological risk situations. In particular, it was calculated the costs and benefits of this local supply chain of timber.

What stakeholders have been involved?

- Forestry owners
- local enterprises
- local policy makers (Municipalities majors or councilors)
- associations
- Center for information, education
- Handcraft

How do you have involved these stakeholders?

- Target: forestry owners.

Communication Tools: letters, articles in local newspaper, panels in public area and building (Municipalities....), section of web sites

Key message:

Forestry owners have responsibility of hydrogeological risk situation

Cutting forest is a good intervention in order to prevent risk

Forest can produce also economic benefits (perhaps, if thinning cuts are enough)

Forest owners can reduce hydrogeological risk and problematic situations and, by the other hand, improve the value of their woods and participate in the creation of a local wood chain

- Target: enterprises

Communication Tools: Focus groups, meetings (one to one)

Key message:

There is the possibility to cut private forests

You could be helped to find public funds (FEASR...)

There is the possibility to build little biomass plants

There are timbers with good characteristics for other uses

- Target: policy makers (Municipalities majors...)

Communication Tools: Meetings (one to one), on site visits, round tables

Key message:

Cutting forest is a good intervention in order to prevent risk

Forest can produce economic and ecologic benefits (perhaps, if thinning cuts are enough)

Public bodies can save money for heating services

In other local situation private owners had been involved successfully in Consortium

The process is long, gradual

Region could “reward” (for example Region could consider the commitment of Municipalities for giving more points in the evaluation criteria of call for tenders)

Have you involved regional policy makers?

- Target: policy makers (Regional councillors...)

Communication Tools: Meetings (one to one) or round tables

Key message:

Forest owners are more private than public

Cutting forest is a good intervention in order to prevent risk

Forest can produce both economic and ecologic benefits (perhaps, if thinning cuts are enough)

It's necessary to start up local supply chain, taking successful existing examples



For developing these processes we need to write simpler rules (new laws)

Do you have individualized a kind of “payment system” for environmental services?

Two possible mechanisms have been individualized:

a) incentives by enterprises to forestry owners in order to make thinning in highly risk areas (especially thinning good trees for handcraft or buildings)

b) Public funds from the savings obtained using little biomass plants

In particular, Municipalities are interested to the second mechanism. The PES in hydrogeological risk areas could be found in the saving of the public bodies obtained by the building of little biomass plants.

Have you individualized a kind of “compensation” for your proposed intervention?

For the development of a PES scheme the other step is to plan some activities in order to develop the supply chain of wood and non wood product:

- increase the ask of local wood, through the planning of little plants for heating in public buildings of Municipalities
- in the table below for one of the 3 pilot areas it was calculated, taking in account also literature data and information (about chips production), the possible savings that yearly Municipalities could have, after changing their traditional plants for heating (in a school for example).

Who has to pay or compensate?

A part of this saving could be invested by the Municipalities, as a Payment for Environmental Services. It could be paid to the Consortium of The Owners and Enterprise for further activities and for maintenance of the territory.

This is the first “PES” that could be developed in the territory, in order to enforce a local economy of forest, but, in the future, Consortium could develop also other PES as the Cards for mushroom picking, or recreational cards in structured green areas for outdoor activities, etc.

Do you have an idea or the perception of the social acceptability of the payments?

First of all, it's very difficult to transmit the idea of payments for the social uses of a natural resource (people dislike to pay and, for this reason, is very important to communicate the value of the social uses of a resources like, for example, of wood). Payments become more acceptable when people see the benefits and the value of them (in terms of saved moneys, for example, or in terms of investments in the territory as the maintenance of the path ways, of the rivers...)

Is there a methodology to calculate the payment or the compensation?

There is a methodology calculated for 1 hectare of forestry in the pilot area. Also with the hypothesis of 2.000,00 €/year for maintenance cost, the total annual cost is about 14.000,00 €, with, more or less, 20.000 € of saving for public body. The calculations made through the pilot area studies, for 1 hectare and for Ceranesi area, are described in the table (following page)

COSTS OF CHIPS AND FURNITURE TO A BIOMASS PLANT
AN EXAMPLE OF ESTIMATE IN A PILOT AREA - Evaluation for 1 hectare

Ceranesi	CA old chestnut forest (coppice)			
CHARACTERISTICS OF FOREST AND INTERVENTION				
forest type	public owner	collective owner	private owner	timber volume m3/ha
old chestnut coppice			X	220,00
silvicultural intervention	intensity	timber volume m3/ha	density of timber t/m3	timber volume t/ha
final cut	85%	187	0,65	121,55

COSTS OF CHIPS PRODUCTION (in € ,for every ton)	
timber value (in forest)	7,00
cutting trees	2,00
skidding timber	18,00
preparation of timber (on the road)	10,00
load and transport on truck	10,00
unloading	3,00
seasoning timber	1,50
chipping wood	20,00
load and transport on truck to implant	7,00
TOTAL	78,50
overheads and benefit for enterprise	20,00
TOTAL	98,50

CHARACTERISTICS OF BIOMASS PLANT AND COSTS (example)				
actual situation	power	type of fuel	annual cost of fuel (€)	
public building	150 kw	gasole		35.000,00
future hypotesis	power	type of fuel	annual necessity of chips (t)	annual cost of chips (€)
public building	150 kw	wood chips	120	11.820,00

Also with the hypotesis of 2.000,00 €/year for maintenance cost, the total annual cost is about 14.000,00 €, with, more or less, 20.000 € of saving for public body.



Is this system sustainable (in time)? If Yes, give a list of the elements that you consider important in order to make the process sustainable

In Liguria the main problem is the presence of 87% of forest owned by about 300.000 private owners. It means that the average of private forestry surface is about 1,5 ha.

The presence of a local Consortium among private owners is the condition of the sustainability of local supply chain and also every kind of PES.

Today, the value of the abandoned forests is zero and so, in order to increase the potential economic benefit of the forestry management, the Consortium has to promote the multifunctional use of forest: wood supply chain, but also non wood product and social use of forests. Also all the possible use have to be promoted together, in an integrated way, firstly in critical areas from an hydrogeologic point of view.

In our pilot area, after the individuation of the areas, with geological and forestry studies, we found some problems for the testing of PES:

- there is not a updated monitoring of private owners; property survey was necessary because of the lack of updated informations
- it's necessary to speak with the owners but it's also very difficult to find all of them. During the 5 meetings the involved owners were about 25% of the total owners, because many people live in other cities, or they are too old, or they don't care about the project. So, we found also other way to communicate and involve other owners, starting from a first group of interested people. For example, some owners suggested to use other communication strategies (posters during local events, local newspapers...)
- in Polcevera Valley there is not a Consortium or another kind of Association among private owners

Is the process transferable to another area?

The project is transferable, obviously, in other areas with same characteristics. It should be also transferable in areas with better characteristics of the three areas that we have choose (for example: better forests, wood with more quality, less fragmented areas and more accessible areas).

It has been decided to develop the Pilot Action in 3 of them: firstly because by studying not only 1 pilot area, but 3 areas, it is possible to analyze different geological and selvicultural conditions, but also different economic and social situations.

For choosing them, these basic criterias have been applied:

- substantial surfaces (minimum some hundred hectares);
- suburban areas, with presence of elements subjects to risk;
- widespread and different hydrogeological degrade conditions;
- presence of substantial torrents, with erosions and slopes problems;
- prevailing forest surfaces, different forest typologies and widespread forest degrade conditions;
- specific composition of forest typologies, with presence of species with interesting characteristic of timber;
- forest structures with age and develop conditions that needs thinning cuts and lighting of slopes;
- access to slope areas and torrents;
- part of areas located in SIC – Importance Community Sites.



The 3 selected areas (and their main characteristics) are:

- Area 1 – Case Grilla: many situations of soil erosion and forest degrade on slopes;
- Area 2 – Rio Freghea: erosion along Rio Freghea river and high density and develop of trunks, with potential instability;
- Area 3 – Rio Riasso: old chestnut and oak trees, with cancer problems and consequent instability of trunks and soils, along the slopes and the main streams.

We think that in Liguria the most important part of the forestry areas is covered by areas with similar problems and territorial characteristic. It's a model that could be transferred in all the Ligurian inlands.

What are the problems to be solved in future?

- The start up of this action is very difficult: the owners don't realize their responsibility in the maintenance of the territory. They (we) have to work all together for grouping the forces and improve the strength of every one, because this is fundamental to reach concrete results; so, the Consortium could start with a little group of convinced owners, and then will increase in number of associated people when it will reach the first results (i.e the first public projects...)
- The monitoring system of land property in the Municipalities is not updated

What are the successful results?

- Grouping people and transmitting them the message that these kinds of problem could be solved only working together, and increasing their sense of responsibility.
- The proposal of creating in Polcevera Valley a session of an existing Consortium with great experience could be the guarantee for the sustainability of the project's results
- The great engagement of the Municipalities show that the policy strategy is focused on the prevention of risks and the help economic system and, widely, create a local chain to use and exploit forestry resources that, without this chain, would be left unused and unexploited and, if not managed, would product more damages than benefits

What are the threats?

- the owners don't want to work and solve problems together, and don't want to join the Consortium
- people want that public offices (like Region, Municipalities, ecc) pay for this services and, widely, for forestry maintenance, without any economic engagement (also for the membership fee in the Consortium)
- The wood for the local procurement obtained from the first members of the Consortium will be not enough. The choice to promote an existing Consortium is a possible solution, because it's also possible to have wood taken from other areas very near to this area (Stura Valley is about 20 km away from here)

What are the opportunities?

- re-use an important natural resource left abandoned and unexplored in the last 30-40 years (remember that we depends of fossil fuels, that will be more and more rare in the future)
- decrease hydrogeological risks, that affect the collectivity, instead of affront them once they are already become (by spending less and less moneys)
- develop inland economy, increasing work for local enterprises

ENVIRONMENTAL DEPARTMENT OF LIGURIA REGION

Title: MUSHROOM PICKING IN LIGURIA: THE CONSORTIUM OF STURA VALLEY

Main goals of the good practice:

- To increase the awareness of citizen, inhabitants and tourist about the value of the forest
- To Increase the number of users of local mushrooms and the number of acquired cards
- To develop a local economy based on tourism and non wood products

Brief description of the good practice

In an area of Liguria (Stura Valley, about 20 km from Genoa) a Consortium of public and private owners and enterprises has developed a regulation for mushrooms pickers, which foresees a PES scheme, through a card for picking. The Consortium develops also innovative tools associated to the card: the use of communication technology for a friendly payment in the area and for giving more information about the territory (QR codes panels around the pathways and on the borders of the forests). These communication tools can be considered also a new connection between forest owners and the citizen.

The presence of the local Consortium is the condition of the sustainability of such a PES and, perhaps, in Liguria for also the other kind of PES. In other near areas similar PES for mushroom picking has been developed by every Municipality, but in this area the % of private owners is very high and, for this reason, it's necessary to have an association among private and public owners in order to manage forests and, above all, the streets for enter in the forests.

What stakeholders have been involved?

- Consortium (existing) of little forest owners
- forest owners
- public local administration (municipality of Campo Ligure , Municipality of Rossiglione)
- local enterprises
- local forestry policy makers
- citizens

How do you have involved these stakeholders?

- Target: forestry owners.

Communication Tools : the forest owners are involved through meetings managed by the existing Consortium Stura Valley, constituted by forestry owners, enterprises. The card for mushroom picking has been introduced to forestry owners as an example of PES, also in order to gather new ideas for other kind of PES (water, biodiversity, tourism). In the Consortium website we have made a specific session on this topic. (<http://www.consorzioforestale.com/index.php?s=funghi>)

Key message (LIST): Forestry owners have responsibility (according to Civil law) in the maintenance of the forestry roads (among the properties) For usual maintenance of the roads it's necessary to find and implement new financing methodologies based on PES. The value of local wood is not enough in order to cover the costs of the maintenance of the roads.

- Target: enterprises



Communication Tools: Focus groups, meetings. Meetings of the local existing Consortium, among private owners and local enterprises. Both the stakeholders participate to Consortium. Enterprises work in single basins of the forestry area, for a multiyear period; they manage specific meetings with local groups of forestry owners and the technical director of Consortium, interested to particular operations
Key message: There is the possibility to cut private forests in the local areas In some case, the laws about forestry works in mountains can allow also direct contracts with local enterprises which guarantee local supply chains (Kilometre zero)

- Target: policy makers (Municipalities majors...)

Communication Tools: Meetings (one to one), round tables
Also Municipalities are partner of Consortium and participate to the meetings. Their policy representatives are also members of Administrative Committee of the Consortium.
Key message: The development of PES for mushroom picking could make able Municipalities to save money; it's difficult for them to find funds for helping private owners to maintain roads

- Target: mushroom pickers (local inhabitants or not)

Communication Tools: The Municipality have exposed some public posters at the start of the season of the mushrooms. Use of web tool: information panels along forestry roads and pathways, and in the borders of the lands controlled by Consortium partners: panels show QR code linked to web site of Consortium with informative maps of associated forest owners of Consortium.

Key message: You can pick mushrooms if you pay a card.

Have you involved regional policy makers?

- Target: policy makers (Regional councillors...)

Communication Tools: Round tables, regional forum on environment, conference of agriculture

Key message: Forest owners are more private than public. Forest can produce both economic and ecologic benefits (perhaps, if thinning cuts are enough). It's necessary to start up local supply chain, taking successful existing examples. For developing these processes we need to write simpler rules (new laws)

Have you individualised a kind of “payment system” for environmental services?

Yes, it's foreseen the payment of a card for the mushroom picking

Have you individualised a kind of “compensation” for your proposed intervention?

The funds of Mushroom picking are used for compensate costs for the maintenance of the local forestry roads

Who has to pay or to compensate?

The PES rules are:

1. No payment for Inhabitants, even if they're not land owners
2. No payment for land owners
3. Payment of a daily card of 8 €
4. Payment of a yearly card of 30 €



Do you have an idea or the perception of the social acceptability of the payments?

Consortium observed some difficulties in the acceptance of PES:

- in some Municipalities near to Consortium areas, also inhabitants pay a card for picking (even if for the symbolic cost of 5 € yearly); so the Consortium card generated some dissatisfactions in the nearest Municipalities around
- somebody consider such a PES as a condition for tourism in this area and, so, according to them it's not convenient to make pickers pay
- it's difficult to distinguish with precision the borders of associated owners from the external ones, because the maps of the properties are not still well defined

Is there a methodology to calculate the payment or the compensation?

The calculation of the outcome of this PES is very difficult because it depends from 2 elements:

1. the willingness to the purchase of the pickers and the problem of control
2. the weather conditions that can be favourable or not for mushroom growth

For example, during the spring of 2011, some pickers bought the cards. After some months, the picking was not good; so, the Consortium decided to give back the costs for the cards, living the card for the year 2012.

So, yearly, the income of the Consortium could change from a few thousands euro to more than 100 thousand €.

Is this system sustainable (in time)? If Yes, give a list of the elements that you consider important in order to make the process sustainable

The presence of the local Consortium is the condition of the sustainability of such a PES. In other near areas similar PES for mushroom picking has been developed by every Municipality. It's the easiest PES for Consortium, even if it's difficult to have a constant income. It would be good to apply this PES with other PES linked to tourism and hiking: a card (also for groups of visitors and families) for buying the possibility to pick mushroom and to enter in pathways. It's easier to develop such a card in a natural Park or in an area with more values from the natural point of view (for example, Nature 2000 Sites).

However, the Consortium Valle Stura develops some actions for finding a balance between the answer of services by the citizen and the offer of forest owners:

- 1) Better way to pay and to communicate the payment system:
<http://www.consortioforestale.com/index.php?s=funghi>
- 2) Postponed payment through mobile phone messages to Consortium before picking and payment after picking. So, only if you pick you pay.
- 3) Additional news through QR code information panels linked to Consortium web site
<http://www.consortioforestale.com/50>
<http://www.consortioforestale.com/18>
- 4) Publication and information activities to associated owners and enterprises and to pickers about the precise way of use the incomes.

Is the process transferable to another area?

The Stura Valley is very near to the city (30 minutes) and a well known vocation for mushroom picking. 16 years ago a Consortium was constituted among 120 forestry owners, 2 Municipalities, local enterprises.



The high fragmentation of property is a very important problem.

A part of the territory is covered by Nature 2000 sites (Liguria is the Italian region with an highest percentage of Nature 2000 sites, 128).

What are the problems to be solved in future?

To solve the problem of acceptability of PES by all the different stakeholders, improving services of information with a still better maintenance of pathways and roads
Improve increasingly the way of signaling the borders of the picking area of consortium, also improving mapping systems

The sanctions for who don't pay are now still low, and controls are insufficient: it would be necessary to change and improve regional law

What are the successful results?

To make more aware the stakeholders about the necessity to integrate different PES in order to add the value to the forest. The mushroom picking is the first PES, but owners, Municipalities and enterprises understand the opportunity to have different income for maintaining territory.

What are the threats?

- Problem to communicate to all the owners
- Economic crisis that could interfere with this process
- The return of wolf in this area (in the last months five attacks to sheeps very near to villages), that could push away the users and pickers

What are the opportunities?

- To increase awareness of the forestry owners about their responsibilities
- To increase knowledge about inland by the citizen and possible users
- To guarantee a possible income for mountain maintenance

SLOVENIA FOREST SERVICE

Title: APPLYING PES TO PROMOTE SOCIAL USES IN PRIVATE URBAN FORESTS NEAR CITY CELJE, SLOVENIJA

Main goals of the good practice:

- examine the willingness of private forest owners to allow for a preparation of recreational infrastructure (e.g. recreational paths and tracts) in their property in exchange for certain amount of compensation paid by municipality
- support social/recreational use of the forest and promote multiple forest use in the private forests
- promote Forest Service and support participation among various stakeholders
- support the rural development by examination of possibilities for additional economic income for private forest owners for providing ecosystem services in their forest areas
- inform forest policy decision makers on the idea of the PES and stimulate them by raising awareness about the multiple importance of the forest.

Brief description of the good practice

The share of forests in the urban area of Celje is 13 % and in the peri-urban area 28%. The social functions of forests near the city were recognised to a large extent more than a century ago. From 1885 to 1892 the Municipality bought 29 hectares of private forests on the slope above the city park. After that new walking paths were constructed and equipped with benches, pavilions and even with the sightseeing tower. The city park and nearby forests were popular for recreation and were suitably maintained until about the 1960's when better mobility of citizens and heavily-polluted environment caused a decline in the interest in these areas and a subsequent abandonment of regular management.

The recent development started at the beginning of the 1990's. The survey in the current state of urban forests of Celje (Hostnik, 1993) and the study on development of social forest functions in the urban forests, along with the emerging conflicts between private and public interests emphasized the need for a long-term oriented forest management. The City Council accepted the initiative of the local Forest Service unit and commissioned the preparation of the strategy plan for the urban forests of Celje. It was produced by the Forest Service and confirmed by the City Council after the panel discussion with stakeholders. The urban forest strategy plan 1996 pointed out the following guidelines and priorities for the urban forest development:

- protection of urban forests by the local law,
- improvement of the ownership structure with the redemption of private forests,
- adapted forest management,
- development of recreational and educational potential,
- intensive and constant public relations and
- assurance of the stable financial resources for the management.

In the next period, the urban development and demands towards forests increased, and a broader area around the city became popular for urban population. The area around the Smartinsko Lake became especially attractive to recreationalists and tourists, bringing weekend crowds from the city and many daily recreationalists. Due to the private ownership in this area, the conflicts among different forest users were about to become more evident. For this reason, the Forest Service decided to investigate the options for directing recreational use to designated area and by doing this protecting the other forest area from inappropriate use and conflicts. Two pilot areas were selected in the urban forests of Celje: Lokrovec area



(210 ha) and Lahovna area (155 ha). They are characterized with highly fragmented private forest property with an average forest ownership area of 1.72 ha.

The economic expectations of private urban forest owners will be investigated through detailed personal interviews with forest owners in the area of four previously designated potential walking paths and cycling forest tracks (with the total length of 13.6 km). The basic topics and guidelines of the questionnaire for interviewing forest owners were selected as well as potential locations for designation of walking paths and cycling tracks. The results will be compared with the possibilities and willingness of the local municipality to pay for the public recreational use through the financial compensation of the affected forest owners.

What stakeholders have been involved?

- Municipality of Celje
- Ministry of Forestry
- Forest owners in the pilot area
- Slovenia Forest Service (Central unit, Regional Unit Celje, Local Unit Celje – all responsible for elaboration of management plans)
- City inhabitants

How do you have involved these stakeholders?

- Target: Municipality of Celje

Communication Tools: Personal communication, Roundtable meetings

Key message: The importance of forests around the city Celje has been increasing

Ignorance of the increased needs and demands of society can bring conflicts, especially in the private forests

Potential conflicts can be mitigated or avoided by appropriate forest land use planning

Important tool to implement multi-objective management measures are PES systems; they can contribute to increase of the implementation of management measures that promote recreational use in the private forests

PES-generated funds can bring income to the forest owners and benefits to the inhabitants of the city Celje; therefore, sustainable development of both, urban and rural part of the municipality could be achieved

- Target: Forest owners

Communication Tools: postal communication – description of the problem and announcement of the interviews, personal communication – guided interviews with more than 110 forest owners, roundtable meetings

Key message: increased recreational use of private forests can be directed to the limited areas by preparing special recreational facilities/infrastructure (e.g. forest paths, exercise places, benches).

The willingness of forest owners to allow for the additional recreational infrastructure in their forests could be compensated by PES-generated funds ensured by the municipality

- Target: Slovenian Forest Service

Communication Tools: Personal communication, Technical meetings

Key message: Pilot action will promote multi-objective forest planning in the area regionally, and in the long term nationally.



PES-generated funds can contribute to actions related to the current forest management plan.

- Target: General public (local)

Communication Tools: Announcements and brief articles in the local press, information leaflets, publication car driving through the city Celje, banners, panels and posters in the major attraction points in the city Celje

Key message: Promotion of the objectives of SylvaMED project by enforcing the PES scheme in pilot actions.

Forest Service and municipality seek for the benefits of both rural (forest owners) and urban (city inhabitants) population.

Multiple use of the forest ecosystems is one of the main objectives of Forest Service and SylvaMED strategy

PES can positively contribute to the protection of forest ecosystem services important for the urban inhabitants and local community; particularly the forestry and tourism sectors.

Have you involve regional policy makers?

- Target: Municipality of Celje and Ministry of Forestry

Communication Tools: Roundtable meetings

Key message: Establishment of legal framework on Municipality and national level to ensure the long-term sustainability of such activities/schemes.

Setting up and disseminating good practices in relation to the payment system for environmental services

Have you individualised a kind of “payment system” for environmental services?

Yes, funds provided by the Municipality are used to fund forestry measures (preparation of infrastructure) and to compensate the limited timber production to the forest owners.

Have you individualised a kind of “compensation” for your proposed intervention?

Yes, each forest owner receives the certain amount of compensation for allowing preparation of additional recreational infrastructure in his forest.

Who has to pay or to compensate?

The Municipality of Celje.

Do you have an idea or the perception of the social acceptability of the payments?

The Municipality has favoured and supported the activities that promote forest ecosystem services which are desired by the local inhabitants. Therefore, payment provided by the Municipality is deemed to be acceptable for the services they receive.

Is there a methodology to calculate the payment or the compensation?

Contingent valuation method (willingness to accept) was used to evaluate the amount of payment.

Is this system sustainable (in time)? If yes, give a list of the elements that you consider important in order to make the process sustainable

- An agreement has been signed between the involved stakeholders, ensuring the long-term implementation of the measures.

- The stakeholders include the main funder, the Municipality of the city Celje, and the forest owners, the main “producers” or “owners” of the services.
- The amount of money that the Municipality is willing to pay is sufficient to cover the compensation for the lost of timber production in the forest area.
- Forest owners are obliged to allow for a directed recreational use of their forests, whereas Municipality will ensure the implementation of management measures (preparation and maintenance of recreational infrastructure including protection measures needed to ensure the safety of recreationalists).

Is the process transferable to another area?

Yes. There are some similar problems (private ownership, high demands for forest ecosystem services) in other parts of Slovenia, especially in the vicinity of the capitol Ljubljana. The Ministry of Forestry is responsible for the elaboration of forest management plans in the whole forest area, and the Forest Service is elaborating them. With the support of Municipality and the Ministry, the PES scheme can be adapted to those forests as well. Furthermore, the Ministry is coordinated by the Government, which is informed on the PES scheme and its potential for adaptability to the appropriate regions.

What are the problems to be solved in future?

- Stronger involvement of Municipality, the Ministry and the Government in the financial matters (providing PES-generated funds)
- Wider dissemination of activities to attract more participants and to promote Forest Service

What are the successful results?

- Willingness of the Municipality to provide PES-generated funds for compensation due to organised recreational public use of private forests and additional recreational infrastructure in the private forests
- Promotion and awareness of the public on forest ecosystem services and multiple-forest use
- Promotion of Forest Service and SylvaMED projects
- Signing of an agreement between local government and forest owners

What are the threats?

- The completion of the SylvaMED project could increase the demands of other forest owners for the compensation of recreational services in their forests, which can be a problem if there are no funds to compensate the measures
- PES schemes may lead to misunderstanding of the multiple-use of the forests (e.g. PES might give an idea of excluding various benefits in the same area)

What are the opportunities?

- Bigger realization of management measures defined in forest management plans
- Possibility for funding of similar (recreation) or other important forestry actions (e.g. protection against natural hazards) through the PES scheme
- Achievement of multiple use of forests despite private scattered ownership and increased demands within the same forest area
- Income increase for rural inhabitants
- Improvement of quality of life for rural inhabitants and tourism development



MEDITERRANEAN AGRONOMIC INSTITUTE OF CREETE

Title: ESTABLISHMENT OF A PES SCHEME BASED ON ORGANISING SPORTING ACTIVITIES IN MEDITERRANEAN FORESTS FOR THE PUBLIC

Main goals of the good practice:

- Promoting the social/recreation uses of the forest
- Attract more visitors that are willing to pay for the protection of the forest
- Inform the local population on the idea of the PES and stimulate them by raising awareness about the importance of the forest.

Brief description of the good practice

The pilot action in the forest of Anopoli/Agios Ioannis in Crete, Greece focuses on the recreation services that the forest can provide to the end users. Despite its remoteness from the urban centre of the city of Chania, a large number of national and international visitors arrive in the area, particularly during the summer period. In recent years, the increased population of the insect *Marchallina hellenica*, combined with the increased average temperatures in the summer and sporadic but more intense rainfall during the winter, has put the forest species under stress. As a result a higher rate of dying trees has been encountered in recent years, putting the entire ecosystem under threat. The forest is under the jurisdiction of the State, but budget cuts and restricted funding do not permit the necessary protective forest actions to take place and mitigate the problem. The aim of the pilot action was to organise two sequential downhill cycling races and an archery competition, with part of the participation fees paid by the athletes being used to fund protective forest actions.

What stakeholders have been involved?

- Municipality of Sfakia (local governance and co-organisers of the races and archery competition)
- Local population
- Forest Directorate (responsible for the management of the forest)
- Management Body of Samaria National Park (responsible for the management of the Samaria National Park, which includes part of the forest)
- TALOS-ANEK LINES cycling team (main organisers of the cycling event)
- Archery division of the Cretan Shooting Club (main organisers of the archery competition)

How do you have involved these stakeholders?

- Target: Municipality of Sfakia

Communication Tools: Personal communication, Roundtable meetings, Announcements and brief articles in the local press, Information leaflets

Key message:

Potential to increase tourism traffic

Environmental benefits for the forest

Sustainable protection of the forest

Promotion of agricultural products through the protection of the forest



Prospects for the increase of the local income

- Target: Forest Directorate, Management Body of Samaria National Park

Communication Tools: Personal communication, Roundtable meetings, Announcements and brief articles in the local press, Information leaflets

Key message:

PES-generated funds can contribute to actions related to the current forest management plan

Participation of the local communities in the forest management

- Target: Event organisers

Communication Tools: Personal communication, Roundtable meetings

Key message:

Pilot action will promote the sporting event in the area regionally, and in the long term nationally.

These specific pilot actions may encourage the organisation of other sport events by other sports unions.

- Target: General public (local)

Communication Tools: Leaflets, Newspaper articles and announcements, Public information meetings

Key message:

Protection of forest benefits to the local community, particularly the agriculture and tourism sectors.

By participating in the PES scheme, the local community reaps additional benefits.

PES is not a form of taxation; the accumulated funds are directed at specific actions and purposes.

Have you involve regional policy makers?

- Target: Region of Crete

Communication Tools: Roundtable meetings

Key message:

Involve and support the local community at each forest for the organisation of leisure and sporting events in relation to the forest.

Transparency in the way the PES-generated funds are spent.

Establishment of legal framework to ensure the long-term sustainability of such activities/schemes.

Setting up and disseminating good practices in relation to the payment system for environmental services

Have you individualised a kind of “payment system” for environmental services?

Funds generated by sporting activities fees are used by the Municipality to fund forestry actions.

Have you individualised a kind of “compensation” for your proposed intervention?

No, forests in Crete are owned by the State.

Who has to pay or to compensate?

The end-user of the forest service (the public participating in the sporting events) pays for the service.

Do you have an idea or the perception of the social acceptability of the payments?

The payment provided by the end-users is deemed to be acceptable for the service they receive.

Is there a methodology to calculate the payment or the compensation?

Each participant in the recreation/sporting activity pays a set participation fee. The majority of the fee covers the organisation expenses and the remaining portion is directed for funding actions related to the protection of the forest, which will ensure the sustainable provision of the recreation/social service in the future.

Is this system sustainable (in time)? If Yes, give a list of the elements that you consider important in order to make the process sustainable

- An agreement has been signed between the involved stakeholders, ensuring the long-term organisation of the events.
- The stakeholders include the organisers of the events, with personal interest in seeing the events continuing in future years.
- The amount of money that the participants are willing to pay is sufficient to cover the organisation expenses and generate an additional amount of money for actions related to the protection of the forest.

Is the process transferable to another area?

The organisers of the events are active in the entire prefecture and region of Crete. With the support of regional Forest Directorates and local Municipalities, the PES scheme can be adapted to any forest that can support the specific recreation/sporting activities (cycling and archery). Furthermore, the Forest Directorates are coordinated by the Regional Authorities, which are informed on the PES scheme and its potential for adaptability to the entire region.

What are the problems to be solved in future?

- Stronger involvement of Municipality in organisational matters
- Wider dissemination of activities to attract more participants
- Persistence of organisation issues that appeared during the pilot actions

What are the successful results?

- Successful organisation of pilot sporting events
- Involvement of experienced organisers, promoting future events
- Signing of an agreement between organisers and local government for the continuation of the initiative

What are the threats?

- The completion of the SylvaMED project could diminish initiative for the organisation of future events

- The financial crisis may reduce the willingness-to-pay of potential participants/end-users
- Unidentified obstacles may inhibit the implementation of the PES scheme in other forests

What are the opportunities?

- Possibility for funding of important protective forestry actions through the PES scheme
- Adoption of the PES scheme at the regional level (the entire island of Crete), by the regional government
- Attraction of more tourists, especially during the low season, through these sporting events
- Income increase for local tourism and agricultural enterprises
- Organisation of other leisure and/or sports events in relation to the forest, which could be integrated in the PES scheme

The Authors:

CTFC:

Juan Martínez de Aragón (forestry engineer), Sandra Torreadella (geographer), Elena Górriz (economist), Dragan

FOREST OWNERSHIP CENTER OF CATALONIA:

Teresa Cervera (forestry engineer), Noemi Palero (forestry engineer)

SLOVENIA FOREST SERVICE:

Robert Hostnik (forestry engineer), Tina Simoncic (forestry engineer), Dragan Matijasic (forestry engineer)

REGIONAL FOREST OWNERSHIP OF PACA:

Louis-Michel Duhén (forestry engineer)

CIHEAM MEDITERRANEAN AGRONOMIC INSTITUTE OF CREETE:

Chariton Kalaitzidis (agriculture engineer)

ENVIRONMENTAL DEPARTMENT OF LIGURIA REGION:

Laura Muraglia (environmental scientist), Umberto Bruschini (forestry engineer), Paolo Derchi (forestry engineer), Andrea Vigo (geologist)

REGIONAL CENTER FOR PRIVATE FORESTRY OF LANGUEDOC- ROSSILLON:

Pauline Marty (forestry engineer), Michèle Lagacherie (forestry engineer)



Bibliography

Górriz , E.; Domínguez, G.; Prokokieva, I.; pending publication. Preferencias de los propietarios forestales sobre instrumentos de regulación de servicios ecosistémicos: el caso de las setas en Cataluña. 6 Congreso Forestal Español (10-14 junio 2013, Vitoria-Gasteiz, España).

Hostnik R. 1993. Stanje primestnih gozdov in odnos do njih – primer Celja (The State of Urban Forests and the Attitude towards them – a Case Example of Celje). In: Urban and suburban forests – our common goods. Conference proceedings. Ljubljana, Zveza društev inženirjev in tehnikov gozdarstva in lesarstva Slovenije: 157–162.

Martínez de Aragón, J.; Riera, P. (2007). Estimació del valor monetari de les externalitats que ofereixen els boscos a la societat: cas de l'activitat recreativa de recol·lectar bolets. Acta 2on Congrés Forestal Català (25-28 setembre 2007, Tarragona, Espanya).

Nadal-Sala, D.; Sabaté, S.; Gràcia, C.; (2012). Eficiència dels diferents models de gestió ORGEST del pi blanc (*Pinus halepensis* L.) i l'alzina (*Quercus ilex* L.) sota diferents condicions pluviomètriques i edàfiques i la posterior implementació dels models més efectius.

Prokokieva, I.; Mavsar, R.; Górriz, E.; pending publication. ¿Quién debe pagar por mejorar la provision de bienes y servicios forestales? 6 Congreso Forestal Español (10-14 junio 2013, Vitoria-Gasteiz, España).

Puig, I.; Freire, J.; (2012). Aspectes econòmics de la implantació d'un pagament per serveis ambientals en la gestió dels boscos per a millores hídriques a Catalunya.

Varela, E.; Mavsar, R.; Jacobsen, J.B.; pending publication. Preferencias sociales en la gestión de pinares de *Pinus halepensis*: ¿Quién se beneficia de la gestión forestal? 6 Congreso Forestal Español (10-14 junio 2013, Vitoria-Gasteiz, España).