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Fire use practices and regulation in Europe: Towards a Fire Framework Directive

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Abstract

The potential of using fire wisely for different management purposes is receiving recent and growing recognition in Europe. After decades of fire exclusion some countries are considering the fire use regulation in the context of forest policy and different territorial policies. On the other hand, there are European rural communities with a fire culture which depend on the use of fire for its welfare.

The regulation of fire use practices in Europe adopts a wide variety of formulas: from a controlled burning with no written plans supported by codes of practices, to a prescribed fire with detailed prescriptions adopted in a plan. Besides, fire-relying communities need legislative frameworks which contemplate and regulate their fire use activities as well as reduce un-wanted ignitions through the development of social prevention programs.
Considering the existing diversity of fire use practices in Europe, according with the management objectives, the influencing factors and the kind of regulations, a new Fire Framework Directive has been proposed in the context of Fire Paradox project for starting a shift in fire policies towards integrated fire management.

Keywords: integrated fire management, prescribed fire, suppression fire, traditional fire use practices, land management.

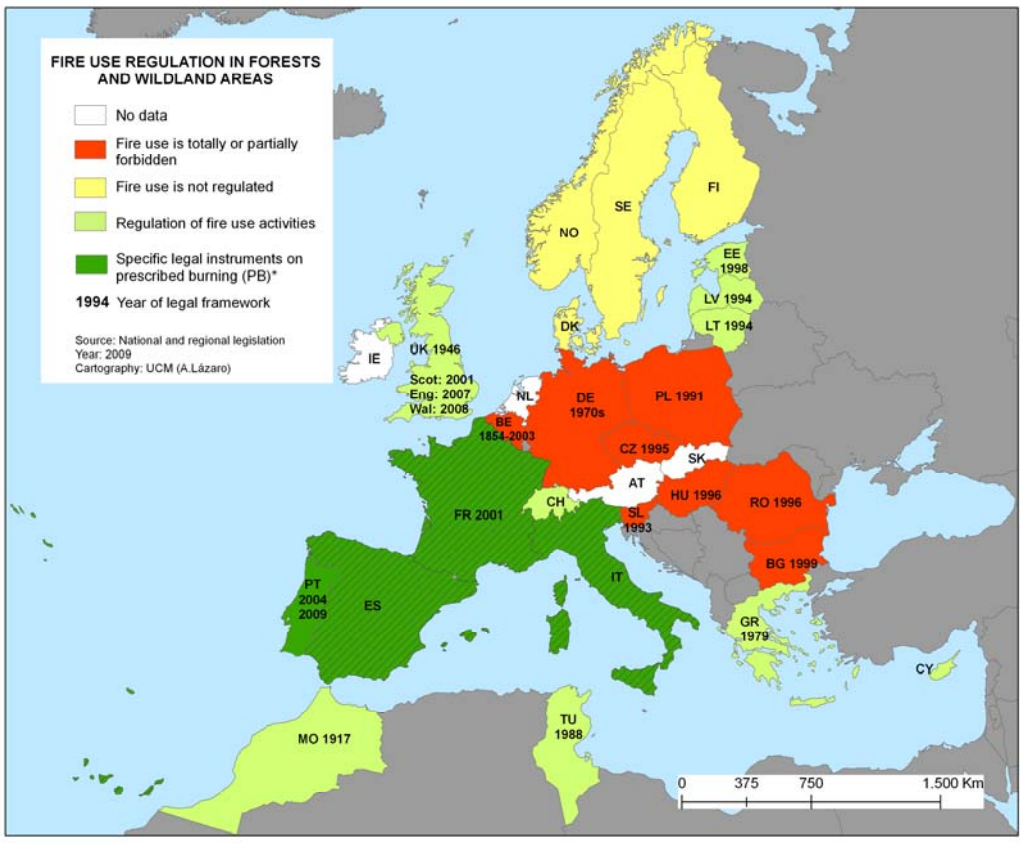
1. Introduction: objectives for the use of fire in Europe

In the history of land-use in Europe, fire has been an important element in forestry, agriculture and pastoralism, and an important process in shaping landscape patterns of high ecological and cultural diversity (Goldammer et al, 2007).

In most parts of Europe, the rural areas crisis during the second half of the 20th century, materialized in rural abandonment and industrialization processes, caused the loss of traditional knowledge and territorial uproot. These rural trends have entailed different consequences in the development of forestry in European countries. In North-western Europe and the Baltic Region rapid socioeconomic changes in post World War II led also to a change in land use systems (increase in technology and external inputs) and landscape patterns, resulting in elimination of traditional burning practices. Moreover, new air and quality standards and a generally prevailing opinion that fire would damage ecosystem stability and biodiversity, imposed fire bans in most European countries (see Fig. 1). On the other hand, in Mediterranean countries, the abandonment of rural areas brought about the densification and homogenization of the unmanaged forest cover as well as the loss of traditional knowledge. In this process, the notion of fire as a useful tool and as an important process in shaping landscapes was lost and its perception changed from tool to threat. However, at present, it is possible to notice another incipient change of perception, and in some cases, re-evaluation of the potential

that fire can play as a substitution tool for imitating historic mechanical or zoogenic fuel treatment for the management of forest ecosystems.

Both, in past and present times, the use of fire, under prescription or not, has constituted a useful management instrument with different objectives. For the use of fire in ecosystem manipulation in Europe some of the principles of interactions between natural or anthropogenic fire and ecosystems from elsewhere in the world are important for developing new concepts. However, it must be pointed out that the use of prescribed fire in Europe is not aiming at "imitating nature" or to reconstruct natural fire regimes. The objectives for the application of prescribed fire in Europe are rather to use fire as a tool for substituting traditional, nowadays abandoned land-use (vegetation use) systems or traditional burning practices, or transferring principles from fire ecosystems to those ecosystems in which fire under prescribed conditions has positive effects on stabilization, biodiversity or productivity.



* In descentralized and administrative decentralized countries the regulation of fire use varies among regions. In Italy, Spain and France only some regions have regulated the use of PB.

Fig. 1: Fire use regulation in European countries.

2. Fire policies and practices in Europe

2.1. State of the art regarding fire use practices

The potential of using fire wisely in land and wildfire management is receiving recent and growing recognition from both professionals and researchers in Europe. Although distrusted by many, changing paradigms in nature conservation and ecology as well as a demand for more economic and flexible tools for land and wildfire management have given either new or renovated interest to prescribed burning and suppression fire practices. However, only a limited number of studies have analyzed

prescribed burning practices in Europe until now. Particular efforts have been concentrated in the use of prescribed burning and the history of traditional fire use practices by rural communities.

European scientific research in prescribed burning started in the 1970s (e.g. Goldammer 1978, Liacos 1977) and with the introduction of this technique in Europe in the early 1980s (Botelho & Fernandes 1998). Scientific research at this first experimental stage was focused in the possibility to use this technique, and therefore in determining its ecologic effects. Nowadays, the environmental conditions which make possible the execution of prescribed fire are clearly defined for some vegetation types, e.g. maritime pine forest (Fernandes & Botelho, 2004), and research has expanded to a wide variety of aspects such as: operational issues on how to plan and execute the burning, the evaluation of its efficiency among other tools for fire prevention, cost-effectiveness studies, history of fire use and the study of traditional practices taking into consideration their territorial specificities and expanding the prescribed burning perspectives as a multi-purpose tool.

Most of the scientific research described above, has been developed in the frame of European research projects, sponsored by the European Commission, mainly focused on wildland fire management issues[1]. Besides, several nature conservation projects have promoted the use of prescribed management ignited fires as well as wildfires burning within prescription. Two LIFE projects have addressed the restoration of coastal dune heathlands in Denmark (Jensen 2004) and habitat management in the Black Forest in Germany. Moreover, prescribed burning has been part of a Life project aimed at the conservation and habitat management of the Scottish Capercaillie (*Tetrao urogallus*)[2].

Also as part of the mentioned research projects, experimental networks and initiatives focused on the wise use of fire have been started with different objectives in several parts of the European continent. Experiments have demonstrated that prescribed burning can be successfully used in both operational and ecological terms. However, there still is a different level of recognition of the role that fire can play in ecosystems.

2.2. Best practices of fire use in Europe

Beginning from the utility and interest of fire use with different management objectives, several examples of good practices and best programmes of fire use can be recognised and pointed out in Europe, representative of traditional fire use, prescribed burning and suppression fire, adapted to different countries and socio-spatial contexts (Montiel & Kraus, 2010).

One of these examples is the prescribed burning programme developed in a nature reserve of boreal forest in Västernorrland (Sweden). Fire is also successfully used for landscape management objectives in the Drover Heide nature reserve (Germany), over an open heathland and poor grassland ecosystem.

Unlike the two mentioned prescribed burning programmes recently carried out in Sweden and Germany, the practices of fire use for habitat and wildlife management at the Glen Tanar Estate (Scotland) are the best example of a deeply-rooted traditional use of fire in Europe. The maintenance of fire use as a land management practice (called

[1] FIRE TORCH, EUFIRELAB, FIRE PARADOX, EUROFIRE.
[2] For more information related to the LIFE project ""Urgent Conservation Management for Scottish Capercaillie" www.capercaillie-life.info

"muirburn" in Scoatland) is a good expression of the strong cultural component of these techniques. Further, the Muirburn Code and the Heather and Grass Burning Code are also good references for future "best practice" management guidelines.

Another representative case of fire use in Europe is the French Prescribed Burning Network, established in Mediterranean regions and covering diverse management objectives from wildfire prevention to pastoral and biodiversity purposes.

On the other hand, the Spanish EPRIF (the Spanish acronym of integral prevention teams) Programme is a strategy for the conciliation of interests between rural people and forest administration, comprising the wise use of fire for grazing improvement and social fire prevention. This programme deals with the negative aspects of traditional fire use –the origin of many forest fires- and at the same time it attempts to promote best practices.

Another nationwide programme dealing with fire use regulation is the Portuguese National Programme of Fire Use and Analysis Group (GAUF), which focuses on tactical fire use for fire fighting. This Programme has a strong strategic component and its implementation is carried out by professional teams, as it is the Catalonian Programme of Fire Management, implemented by the Forest Action Support Group (*Grup de Recolzament d'Actuacions Forestals, GRAF*). The philosophy of this Regional Programme, established in 1999, is to base fire fighting on fire analysis, in order to adopt dynamic strategies of attack, containment, confinement or management by using hand tools, heavy machinery as well as suppression fire tactics.

Consequently, fire management as a tool of land management appears in each and every country and region of the European Union, setting the challenge and need of a proper regulation on the matter (Lázaro & Montiel 2010). Further, those countries with territories at medium or high risk, where fire is a traditional land use and resource management tool, should promote Social Fire Prevention Programmes (similar to the Spanish EPRIF Programme) that could also be integrated in the Rural Development Programmes. The main aims of these programmes should be:

(a) Analysis of the causes and motivations for uncontrolled burning,

(b) Population awareness campaigns on fire risk and compliance with regulations,

(c) Promotion of programmes for controlled burning, where appropriate,

(d) Promotion of alternatives to fire use for fuel management, such as clearings, use of forest biomass or controlled grazing, where appropriage.

2.3. Contributions of the FIRE PARADOX project to fire policy and legislation development

The main objective of the FIRE PARADOX project is laying the foundations for new practices and policies regarding integrated fire management in Europe, including the professional use of fire and the development of strategies to be implemented at European scale.

The *integrated fire management* considers the different aspects of fire management (prevention, detection, extinction and use), including the following integration concepts:

1. Fire use in silviculture and other land management purposes, according with the aims of prescribed burnings.
2. Community fire use, integrating the activities and capacities of rural population to develop different objectives of land management.

Thus, the general approach of the FIRE PARADOX project consist of the integration of fire use in fire prevention and fighting strategies, promoting the positive effects of fire use through prescribed burnings and traditional fire use, and reducing its negative impacts by means of suppression fire used in fire fighting tasks.

The contributions of the FIRE PARADOX project to policy and legislation on integrated fire management in Europe consisted of performing a thorough, complete analysis and assessment of the regulations, policies and practices involving wildland fire management and fire use as a management tool, pursuing the aim of setting out proposals including new political approaches which promoted good practices. Definitely, it is about defining the basis for the new political and juridical measures which developed integrated fire management systems adapted to the European context.

As a last resort, the contributions made by the FIRE PARADOX Project regarding policy and legislation intend to promote a responsible, useful fire use, adapted to the different contexts and socioeconomic and spatial demands, according with technical requirements and social interests. That is, a positive approach is set out, aware of the regulation of fire as a tool for wildland fire risk management (prescribed burning and suppression fire) and land management (crop and livestock uses, landscape management and nature preservation).

3. Main Findings

- **Traditional fire use:** although fire use has been recognized as a widespread tool for rural Europe, its current state presents two different situations: (i) a general abandonment of traditional fire practices in Central European and Baltic countries in contrast with (ii) the maintenance of fire as a deeply-rooted tool for agricultural and livestock purposes in Mediterranean Basin as well as in other European countries of recent integration in the EU (i.e: Bulgaria, Lithuania) in which agrarian activities are still an important part of local economies (see Fig 2). The influence of ongoing socioeconomic dynamics has been identified as fundamental for the maintenance/ eradication of the traditional use of fire.
- **PB as a substitution tool in the context of fire use in Europe:** In Europe the introduction of prescribed fire is not aiming at “imitating nature” or to reconstruct natural fire regimes, but presented as a substitution tool for traditional - nowadays abandoned - land use and management systems or traditional burning practices, and hence is to be applied in cultural ecosystems rather than in natural fire ecosystems.
- **Development of PB in Europe:** the incipient development of PB practices in Europe has taken place in different areas and with different objectives (see Fig. 3). Results obtained till the moment show how in Mediterranean countries this technique has been introduced mainly for wildfire prevention purposes, while in Northern Europe silviculture and nature conservation are the main objectives for its application. However these tendencies have shown to evolve with time since some southern countries (i.e. France and Portugal) have started to expand its objectives to forest and biodiversity management, while the increase of wildfire risk in North and

Central European countries might entail the development of PB initiatives for wildfire prevention in a near future (i.e. Germany).

- **PB for wildfire prevention:** the application of PB for wildfire prevention is concentrated in the southern European countries. Although the introduction of this technique in Europe took place in the early 1980s, results obtained till the moment evidence how its development has acquired a relevant progress towards the end of the 90s and the beginning of 21st century.
- **Development of suppression fire (SF) practices in Europe:** the information gathered for suppression fire practices shows evidence that these techniques are mainly concentrated in the southern European countries, having an earlier development between the 70s and the 80s in Portugal and Spain and more recently in southern France and other European countries (see Fig. 4). However, in some cases, its monitoring has been hindered by the confusion between traditional suppression fire use by rural population and its implementation by forest and civil protection services, as well as due to the clandestine character associated to this technique in many European countries.
- **The regulation of fire use practices in Europe** adopts a wide variety of formulas: from a controlled burning with no written plans supported by codes of practices, to a prescribed fire with detailed prescriptions adopted in a plan (Montiel & Kraus, 2010).

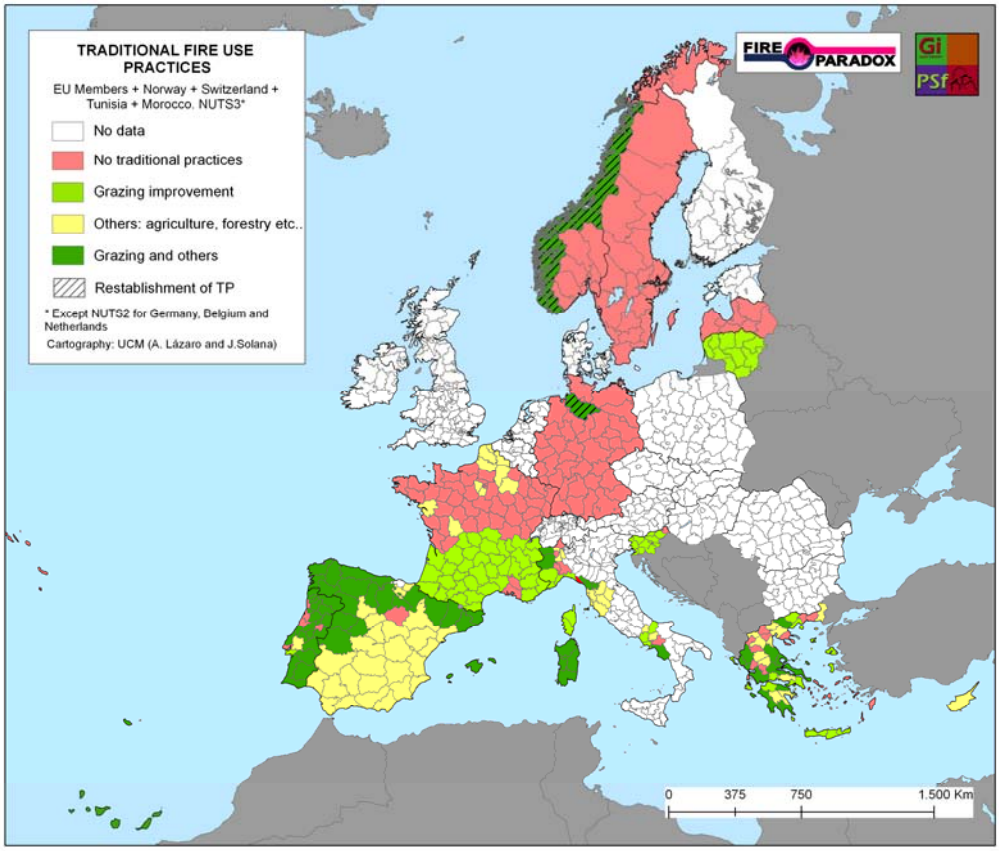


Fig. 2: Traditional fire use practices in Europe.

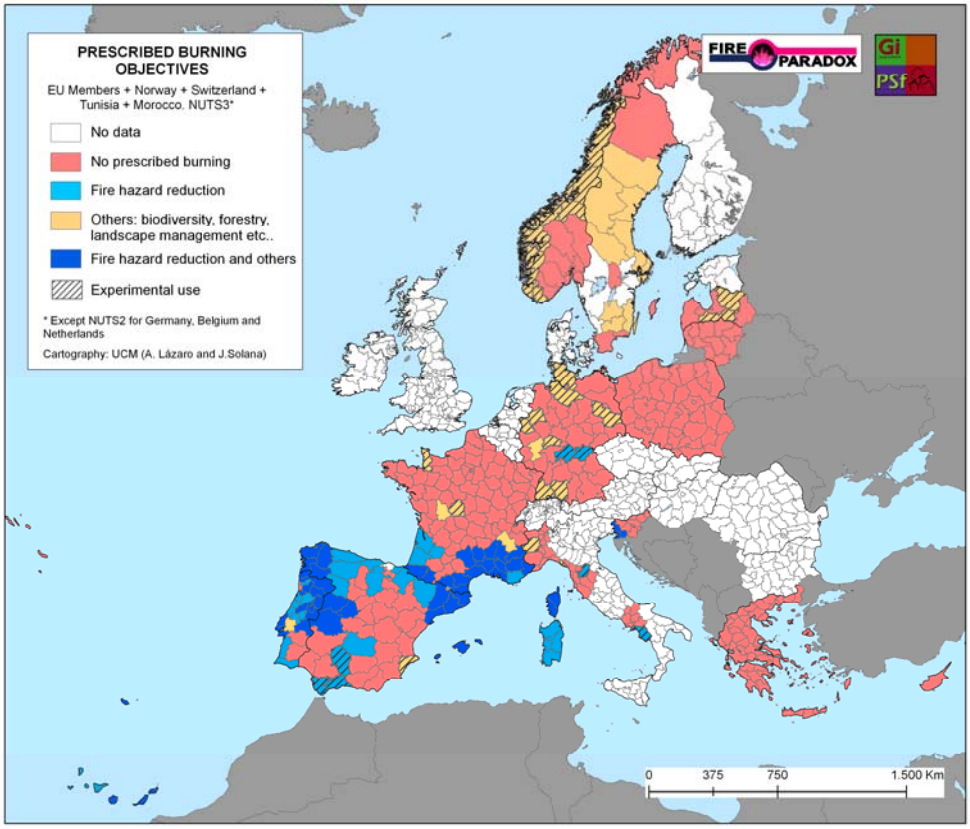


Fig. 3: Prescribed burning objectives in Europe.

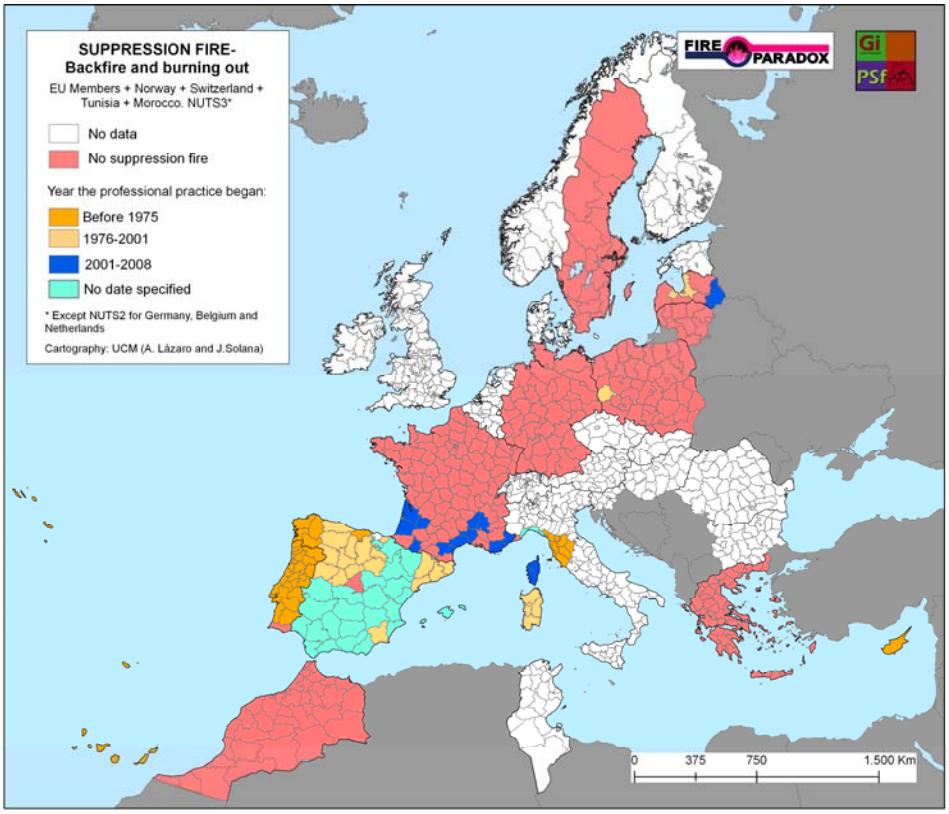


Fig. 4: Suppression fire development in Europe

- Existence of **influencing factors determinant for fire use practices**: Spatial contexts and on-going socioeconomic dynamics have been identified as determinant influencing factors for the existence and nature of fire use practices in the different

countries and regions. The identification of the particular factors influencing fire use practices at the regional and national levels is fundamental since only an appropriate application of the fire use techniques according to regional specificities will have the possibility to achieve a necessary social and political agreement allowing the use of fire for management purposes.

4. Towards a Fire Framework Directive

4.1. Juridical basis for the integrated harmonisation and regulation of fire management in Europe

Taking into account that wildland fires are one of the most significant problems affecting European territories and societies, especially in wildland-urban interfaces, and likewise considering the great heterogeneity of political measures and regulations on wildland fire management, their insufficiency or inadequacy in many cases, and the wide diversity of situations in fire use that is present in Europe, it appears as necessary defining a normative framework able to update and harmonise the different existing legislations and policies on the matter. The aforementioned framework must start from the knowledge of the current demands and necessities as well as from the acknowledgement of diversity. It must therefore be flexible enough to improve and favour the effectiveness of the adopted measures by the competent political-administrative authorities.

In order to make practical proposals oriented to give response to these necessities, the following threats and opportunities on the matter of wildland fire management policies and legislation have been identified:

- There are significant contributions and advances in some national and regional regulations which provide an interesting starting point to establish a future common legal framework of reference for the Member States.
- Although the Union law has contributed to the approximation of the laws of Member States, there are still big differences between countries, even within large national spheres, which make difficult the effectiveness of integrated fire management (Montiel & San-Miguel, 2009)
- Wildland fire risk management is absent or insufficiently developed in the forest policy documents of many countries, although climate change and trends of global change mark them as new risk areas.
- The different impact of fire risk in the various regional contexts and the different political-administrative systems existing in each country make necessary a flexible political and legal approach on the matter of integrated fire management. But the scope of the problem and the needs of coordination to deal with it, likewise demand a Community approach in order to provide efficient, common solutions to general challenges.

Consequently, from the FIRE PARADOX Project, the initiative of a new European Framework Directive has been set out. A new Regulation which covered the political and legal gaps that exist at present in some countries and which also gave response to the current realities and demands, by means of defining an integrated fire management system adapted to the complex, specific European context.

4.2. Justification of the proposal for a Framework Directive on Fire Management

Although fire management is competence of the Member States, the Community scope of the problem of wildland fires and the higher effectiveness of the European Union to reach adequate results at European scale justify the initiative of facing a harmonisation of the laws on the matter, based on the article 175.1 of the European Union Treaty.

In any case, the different impact of this problem in the various regions of the Union justifies a flexible harmonisation, being the Framework Directive the proper juridical act to achieve basic homogeneity of a quite scattered regulation (since wildland fires have transversal caused and effects involving multiple matters and sectors), which enabled to accomplish common objectives through the considered means by each Member State.

It is true that the European Union (EU) has announced several Regulations on the matter of wildland fire prevention since the year 1992, whose validity has gradually expired. Other initiatives on the matter, of sectoral nature too, have been set out in the European Rural Development Regulation and in the European Union Communications on natural disaster prevention and response. But neither of these norms featured an integrated, permanent nature to deal with a problem of bigger and bigger scope and consequences in Europe (Montiel & San-Miguel, 2009)

That is why a renewed, integrated and long-term approach for fire management in Europe is recommended. Wildland fires are not only a problem of Mediterranean countries. In the rest of the regions, the risk is also present although intensity and significance are variable. The EU intervention, from an integrated, framework perspective, is justified by several reasons:

(a) By the transboundary effects that wildland fires may generate and pose.

(b) By the existence of many diverse environmental causes and consequences related to this risk but also of different nature, which require coordination at European Union scale.

(c) Because wildland fires are a middle- and long-term problem linked to the effects of climate change.

(d) Because means and costs involved in actions taken as for integrated wildland fire management are on the increase.

On the other hand, fire management as a tool of land management appears in each and every country and region of the EU, setting the challenge and need of a proper regulation in order to accomplish the pursued aim in a reliable, effective manner.

Regarding the proposed juridical form, it’s worth mentioning that Directives force Member States to achieve the goals set in the Community norm but entrust each State with the choice of the means to accomplish it (art. 249.III of the European Union Treaty). Besides, the Protocol No. 2 of the Treaty states that “Other things being equal, directives should be preferred to regulations and framework directives to detailed measures”.

Therefore, a positive approach to fire management is possible in Europe. It requires being aware of the regulation of fire as a tool for wildland fire risk management (prescribed burning and suppression fire) and land management (crop and livestock

uses, landscape management and nature preservation). But it also demands a new policy and legislation approach to promote a responsible, useful fire use, adapted to the different contexts and socioeconomic and spatial demands, in accordance with technical requirements and social interests.

The initiative for a new Framework Directive on fire management means an opportunity to harmonise and update the national regulations on the matter, defining a common reference which guaranteed effectiveness and adaptation to the specificity and diversity of the European context. It is set out as a proper way to avoid uniformism in the juridical treatment of the matter in the whole territory of the European Union and at the same time to establish a harmonising, basic and minimal arrangement, flexible enough to avoid an undesired homogenisation.

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