

Perils in the adaptation of fire management to a changing world

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Future climate conditions point to a significant increase in wildland fire risk in many fire-prone areas, but particularly in Southern Europe and the Mediterranean region. Under these prospects, it is important to evaluate how well prepared fire agencies are to cope with the new conditions, what the potential damages are that future fires might cause, and what policy changes might be needed to address future fire management needs. To address these issues in FUME, we conducted a series of focus groups with stakeholders in Spain and Italy, to identify needs and gaps in science-technology transfer. Additionally, the economic impact of projected fire changes was estimated for Italy. A review of EU fire-related policies found that a disconnect exist between policy, science and management. It also revealed that fire costs and damages can greatly increase and that fire policies should be revised in a manner consistent with changing conditions.

Implications for policy and management

- Public investments efficiency in wildfire research and wildfire management operations depend on resolving the disconnect problem between science, policy and management.
- Wildfire policy development needs to change with scientific development and operational applications.
- At the operational level, changing climate conditions, population growth and RUI expansion will likely necessitate more financial and firefighting resources in addition to more integrated fire management policies and incentives to private owners to invest in fire protection activities.
- To improve coordination between science and management, and to improve research and operational efficiency, it is best to involve agencies responsible for wildfire prevention and suppression in the research process from problem identification to operational tools implementation.

The problem: Given changing climate conditions, demographic change and urbanization, a difficulty in dealing with wildland fire problem is re-establishing the connection between all institutions involved. Three main concerns were identified: 1) Climate change scenarios project increases in temperature and more frequent and extreme drought conditions, which could lead to significant increases in wildfire risk and fire loads in Southern Mediterranean basin countries; 2) Economic impacts associated with this increase in fire risk and load may move countries to not having enough social, financial and economic capital to address the problem adequately; and 3) The existence of a

disconnect between science, policy and management.

The approach: The disconnect between science, policy and management was addressed by building a "bridge" of communication through several meetings between scientists and stakeholders and fire operation managers (see Fig. 22.1) (problem 3). An analysis of fire management plans in Mediterranean countries was used to identify strengths and weaknesses of current Fire Prevention and Fire-fighting planning instruments with respect to adaptation to future fire regimes (problem 1). Two additional important activities were conducted. One was an economic analysis of the current and potential impact at the national level of the present and future changes in fire regimes in Italy (problem 2). The other was a comprehensive forestry policy and fire prevention and control policy analysis at the European Union (EU) level to understand how the EU and its member states address the problems presented (all 3 problems).

Achievements: In our work we found the existence of a rift between science, policy, and managers. Stakeholders such as regional fire managers warn that the significant advances in science to deal with future fire regimes under changing climate conditions has not been properly transitioned into useful applications on the ground. Furthermore, a disconnect between the policy making, scientific and wildfire management communities was noted (see Fig. 22.2). A review of EU funding schemes for forest management reveals a lack of uptake of the measures and the absence of a sufficient logic in the area of forest fire prevention and action. The annual investments in wildfire protection in the EU

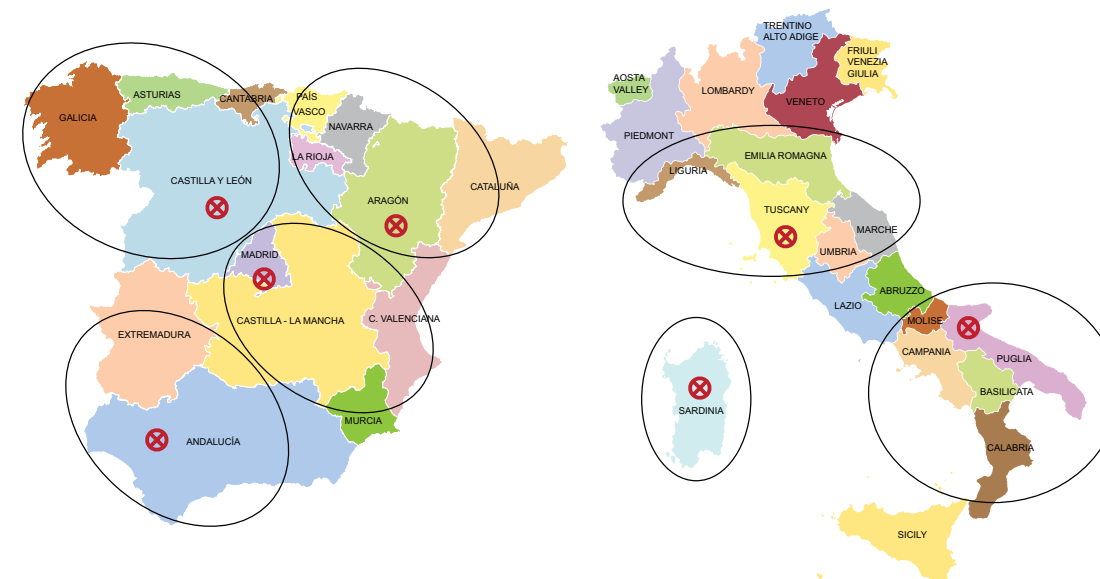


Fig. 22.1: Map showing locations of stakeholder meetings in Spain and Italy.

are already very high and the projected increase in fire loads will necessitate additional financial resources. We used three cost categories to assess the economic implications of future fire events in the Mediterranean area (direct market losses from disrupted hectares of Mediterranean forest using as reference forestry sector shares of national value added; the total social cost of carbon emitted during fire events; and finally existence value losses) we found that for the Mediterranean area as a whole they range, depending on climate and economic scenarios considered, from \$ 1.3 to 45.7 billion per year. These are conservative estimates as not all relevant impact categories (e.g., property and human life losses) were included in the analysis. Our studies show that in the "worst case" scenario the economic impact of wildfires amounts to an annual loss equal to 3% of Italy's GDP.

Lessons learned and implications: In addition to distinct differences in each sector objectives; there is a significant difference in the temporal work scale of each of the three sectors investigated (policy, science, and management) making knowledge transfer between them difficult. Consideration of main stakeholders' needs and existing scientific knowledge is important when developing fire policies.

This implies that the EU could focus its support to better link scientific knowledge with firefighting and prevention tools. The economic consequences of projected increases in wildfires risk for the Mediterranean basin are significant (\$1.3 to \$45.7 billion per year), implying that integrating fire management into land management is cost effective.

Disconnect between science, policy and operations

"That new fire-climate fire model is very promising. It projects the dynamic climatic influence on fire into the future. As managers, we could then adapt to change by projecting our management response accordingly. But the reality today is that we cannot because the policies that guide us are not adaptive, they are prescriptive and we must work within those limitations."—Fire manager at a FUME stakeholders meeting

"This discovery you have shared is important! However, these research results must be translated into a form that can be made operational by managers. The construction and maintenance of the bridge between "validated science" and "operational tools" is often overlooked and under-resourced."—Fire manager at a FUME stakeholders meeting.

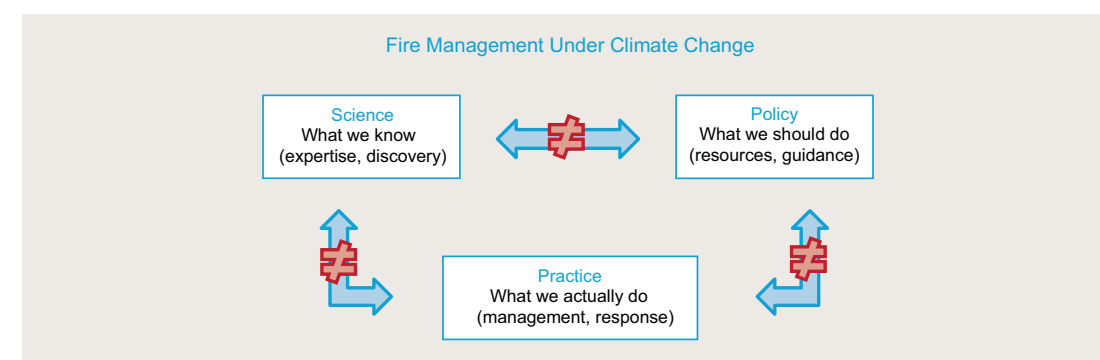


Fig. 22.2: Diagram showing disconnects between science, policy and operations as discussed by stakeholders.