



Factsheet

Socioeconomic Thematic Strand

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Purpose

This Factsheet sets out the background and approach used by the socioeconomic Thematic Strand (TS) to develop a common understanding of possible socioeconomic futures in wildfire risk assessment. We use the well-established SSPs (Shared Socio-economic Pathways) to explore alternative socioeconomic futures and their implications for designing effective wildfire risk management (WFRM). With both climate change and socio-economic drivers increasing future wildfire risk, wildfire adaptation will have to adopt effective strategies to mitigate risk, while preserving the livelihoods and wellbeing of those affected, and limiting carbon release and ecosystem damage.

We understand socioeconomic as an umbrella term for “a wide range of aspects of societal, or more broadly, socioecological systems”, including “demographic, political, social, cultural, institutional, life-style, economic, and technological aspects, and the conditions of ecosystems and ecosystem services that have been affected by human activity such as air and water quality, biodiversity, and ecosystem form and function”, and thereby explicitly exclude “conditions related to future climate change itself” [1].

Rationale: Why focus on socioeconomics in WFRM?

The importance of socioeconomic dynamics in the formation of climate risk is well recognised [2]. However, biophysical factors still dominate assessments of future climate risk [3], even though the planning and design of effective adaptation measures requires a comprehensive understanding not only of climatic drivers, but also of the interaction between hazards and future societies and economies [4].

To this date, the dominant management approaches largely neglect the complexity and contemporary nature of wildfire risk in a world undergoing constant climate and socioeconomic change, taking insufficient account of the diversity of areas prone to fire now and in the future [6]. In addition to climatic drivers, demography, socioeconomic and institutional factors, settlement patterns, agricultural land-use, forestry practices and implemented risk management strategies are fundamental to determining wildfire. This TS emphasizes the importance of accounting for these socioeconomic determinants of wildfire risk across different socioeconomic pathways and thereby supports Firelogue’s approach of accommodating different WFRM related futures across WGs.

A common understanding of possible socioeconomic futures in WFRM

Given that uncertainty related to socioeconomic development is a major determinant of future European wildfire risk, we present a set of plausible narratives through qualitative descriptions of future societal and economic development. These build on the established concept of Shared Socioeconomic Pathways (SSPs), which are conceptualised as global narratives [1, 7] and have been extended for the European context as EUR-SSPs [8]. We use three of the five SSPs, covering the most decisive differences relevant in the context of WFRM. The narratives differ with respect to their trends in population, economic development, institutional effectiveness, equity, environmental concern and ecosystem wellbeing and thus span a sufficiently broad spectrum for assessing future wildfire risk and the challenges of designing adaptive WFRM strategies.

The narratives we introduce here relate to (EUR-)SSP1, a sustainable Europe with rapid technological and economic progress and low inequalities, contrasted with (EUR-) SSP5, a carbon-intensive Europe, where rapid technological and economic progress is supported by carbon-based fuels [8]. In addition, (EUR-)SSP3, a divided Europe, accounts for a future that is characterized by high levels of inequality, environmental degradation and the failure of institutions [8]. See Table 1 for more details on the socioeconomic futures and differentiation among them.

Table 1 Qualitative descriptions of socioeconomic futures considered [8]

		A sustainable Europe	A divided Europe	A carbon intensive Europe
Narrative		Sustainable economic growth through effective governments and cooperation. More equal societies adopt less resource intensive lifestyles, enabled by a progressing energy transition.	Europe is fragmented with strong regional rivalry and inequalities between and within countries. Production is carbon and resource intensive, causing severe ecosystem failures.	Fossil-fuelled growth stimulates economic wealth, at the expense of environmental degradation. There is strong faith in technological solutions manage social and ecological problems.
Key elements related to WFRM	Economic development	Gradual, increasingly equitable growth	Low, high inequality	High, increasing wealth
	Environmental policies	Effective sustainable solutions	No priority, ineffective	No priority, ineffective
	Social cohesion	High	Low across EU, higher within countries	High
	Quality of governance	High, sustainability focus	Low and ineffective	High, business focus
	Technology development	High, but not pervasive	Low	Strong, crucial
	Human capital investment (health & education)	High	Low	High

Implications for future wildfire risk and the design of WFRM strategies

Accounting for these uncertainties and dynamics in the socioeconomic system is crucial for future WFRM planning, as risk assessments based on historical trends may become inefficient and misleading. See Figure 1 for an illustrative conceptualization of potential socioeconomic dynamics to consider when designing WFRM.

A major factor in wildfire hazard across Europe is rural land abandonment [9], [10]. In a sustainable Europe, where development stays within environmental boundaries and land use is strongly regulated [11], rural abandonment due to ecosystem degradation or the spread of invasive species has a small impact on hazard. This is in contrast to a divided Europe, where almost no land-use regulation leads to serious possibly irreversible ecosystem degradation. High rates of agricultural intensification and yield increases in a sustainable Europe raise wealth, reducing rural land abandonment relative to a divided Europe, where low agricultural intensification reduces sectoral incomes.

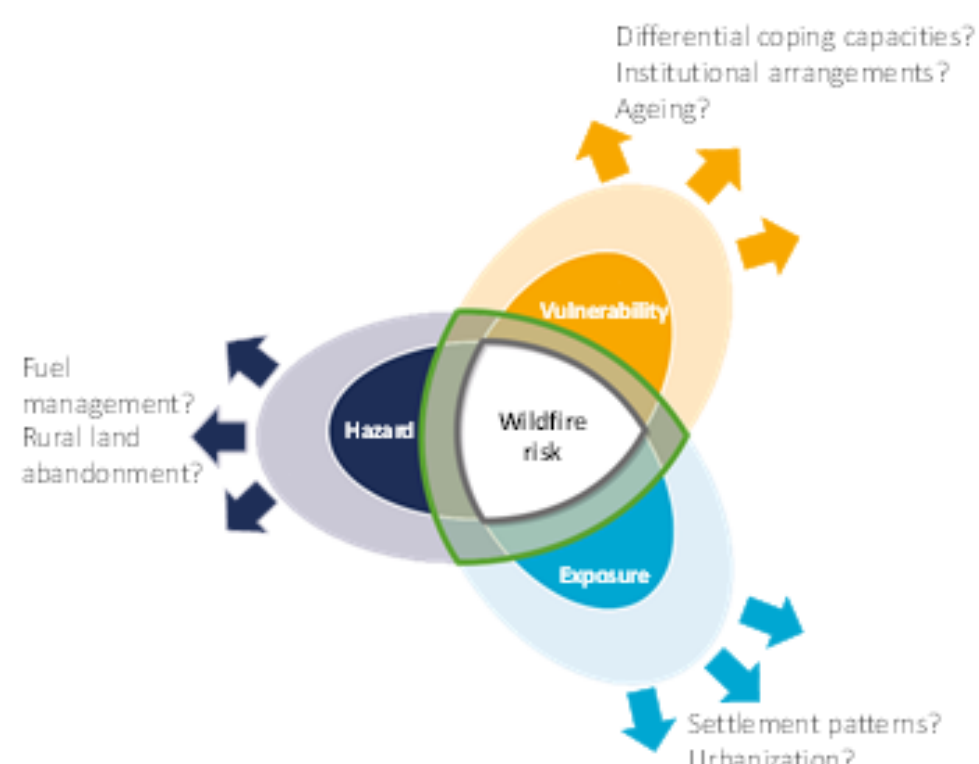


Figure 1 Illustration of how socioeconomic processes affect the dimensions of wildfire risk.

Exposure to wildfire of private assets and economic production largely depends on the level of urban sprawl and the importance of agricultural production as a share of gross economic value added. Population and income growth increase exposure most significantly in a carbon-intensive Europe, positive population and income growth rates prevail also in a sustainable Europe [12]. Insufficient land use management and planning in a divided and carbon-intensive Europe lead to an increase in sprawl [7]. High levels of urbanization, education and income growth reduces the reliance on primary production and thus exposure of economic production in a sustainable Europe, whereas poor institutions, low education and technological development in the agricultural sector increases exposure of economic activity and livelihoods in a divided Europe.

As a major determinant of the capacity to cope with wildfires, vulnerability due to socioeconomic status is lower in futures with high economic growth, increased wealth and effective institutions, compared to a divided Europe. Insufficient healthcare capacities in a divided Europe, where countries are burdened with climate-related health effects [13], increase the risk especially for vulnerable groups. Poor levels of education, alongside dysfunctional institutions increase wildfire impacts on livelihoods and economic well-being, particularly in a divided future [7], [14]. High levels of ecosystem degradation and thus high risk of disruption by wildfire further increases vulnerability of sectors reliant on provisioning ecosystem functions especially in a divided Europe, whereas improved environmental conditions and strong regulations avoiding environmental tradeoffs reduce this vulnerability in a sustainable Europe.

Conclusions & implications for WG discussions: What can we deduce for future WFRM?

In light of the socioeconomic uncertainties discussed above, robust and effective wildfire adaptation pathways are flexible and transformational in nature, avoiding lock-ins and maladaptation from maintaining conventional wildfire risk management strategies. With climate change and socio-economic drivers increasing future wildfire risk, wildfire adaptation will have to acknowledge exposure and vulnerability, adopting effective strategies to mitigate risk, while preserving the livelihoods and wellbeing of those affected, and also limiting carbon release and ecosystem damage.

Adhering to the concepts of adaptive policymaking [15], [16] and adaptation pathways [17], we conceptualize a multidimensional possibility space illustrated via three plausible future socioeconomic futures for designing dynamic adaptive policy pathways for managing future wildfire risk. Thereby, adaptation planning should pursue a strategic vision, while committing to short-term actions and establishing a suitable framework for guiding future actions [18].

Table 2: Suggested points for discussion for WG exchange based on the topics proposed by IAs and FireEURisk. The points raised aim to support a strategic and flexible design of WFRM policy pathways that accounts for the uncertainty of socioeconomic dynamics.

	Topic 1 (Economic dimension)	Topic 2 (Environmental dimension)	Topic 3 (Social/Justice dimension)
Environmental & Ecology WG	Economic role of ecosystem services	Requirements for effective post-fire restoration	Winners/losers from ecosystem restoration
Societal WG	Preservation of livelihoods & critical industries	Environmental concern	Differential vulnerabilities, intersectionality
Infrastructure WG	Role of the public sector and public-private partnerships	Conflicts: infrastructure & environment	Liability in case of unintended, unfavourable outcome

Insurance WG	Feasibility of reinsurance & public sector involvement	Insurance as incentive for ecosystem preservation	Affordability of insurance products & adaptive capacities of communities[BC1] [BC1]Of households?
Civil Protection WG	Financial capacities to prepare & adapt	Conflicts: civil protection & environmental objectives[BC1] [BC1]You mean response vs. prevention?	Inclusivity of communication strategies

Key references and sources for further information

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