



Stakeholder and Social network analysis for understanding forest (fires) management – a contribution based on a Systematic Literature Review

¹Fernandes C., ²Valente S., ³Figueiredo E., ³Polido A.

¹ Department of Environmental and Planning, CESAM, University of Aveiro, Portugal; ² ForestWISE, Vila Real, Portugal; ³ Department of Political, Social and Territorial Sciences, GOVCOPP, University of Aveiro, Portugal



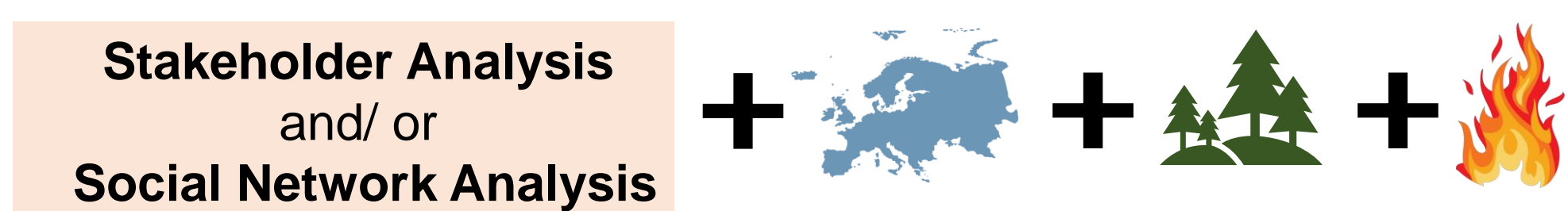
Introduction

Finding strategies and measures to prevent and mitigate rural fires is at the top of the socio-political agendas in Portugal. This is due to the recurrence and intensity of rural wildfires, but also to constraints related to the management system of rural fires, which is based upon multiple organizations, structures, and stakeholders, probably enhancing tensions, conflicts, and poor communication, which could narrow a successful operationalization of fire management policies.

Stakeholder analysis (SA) is a tool that can help to understand and cope with those limitations. Its application enables the understanding of a complex system, including the relevant actors, their goals, interests, plans, influence levels, resources, behavior, and interrelations. Considering the limits of SA methods in determining the role of communication networks and understanding the patterns of interaction, Social Network Analysis (SNA) is an essential tool for assessing the relationships amongst actors, their positions within a network, and the drivers of the different interactions.

Objective

Conduct a **systematic literature review (SLR)**



Motivations

- Analyze the relevance of these topics within the scientific literature;
- Explore how SA and SNA have been used within forest-related research;
 - research topics; aims of research and motivations to use SA and SNA tools;
- Extract key lessons from the case studies analyzed;
- Find the main research gaps;
- Contribute to guide future research in the field.

Methodology

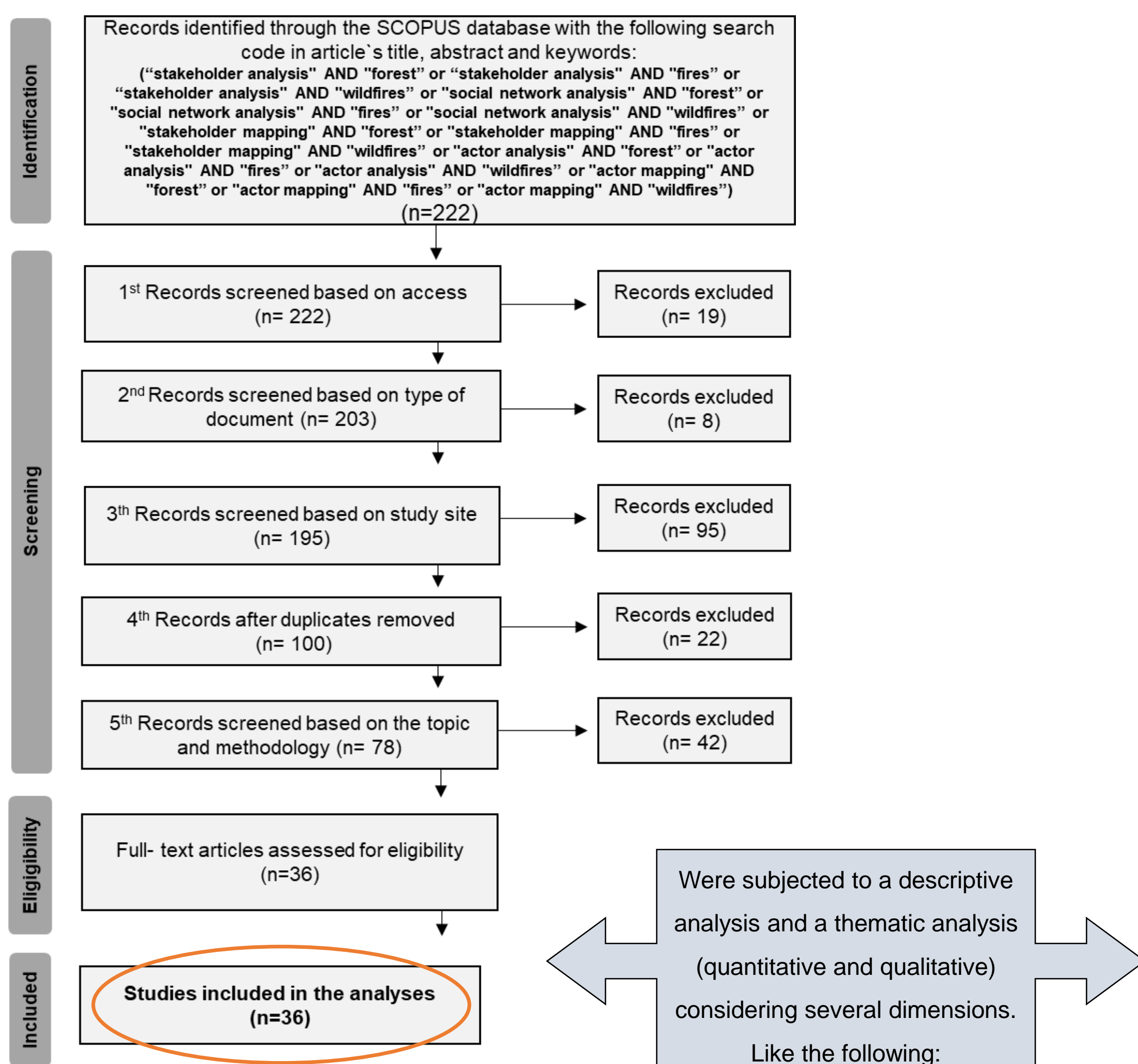


Figure 1. PRISMA flow diagram of the article selection process.

Results

Method	Purpose	For what	Reference	
Stakeholder Analysis	Develop a method	Identify stakeholders and analyzes their perceptions/opinions	Nkodnosa et al. (2015)	
		Identify stakeholders and public participation in forest plan	Bruña-García & Mavey-Pérez (2018)	
	Understand the existing system	A conceptual framework for the systematic application of stakeholder analysis in ecosystem services research	Support policy- and decision-making processes	Raum (2016)
		The state of coppice forestry, identify key stakeholders and their interests	Improve existing system: Support policy- and decision-making processes	Veitchkov et al. (2009)
		Clarifying the changing roles and demands of different stakeholder groups and to identify potential impacts of coppice forestry against the background of relevant legislation, environmental and forest policies in CEE countries	Support policy- and decision-making processes AND Support participatory process	Wolfslehner et al. (2009)
		The multiple-use forest-management participatory plan (complex situations)	Improve existing system: Support participatory process	Nordström et al. (2010)
		Stakeholders participation planning (identify stakeholders, planned participation level) and methods used	Support policy- and decision-making processes AND Support participatory process	Nastrian & Pinat (2015)
		Stakeholders' perceptions (forest functions and threats to forest multifunctionality)	Support policy- and decision-making processes	Pastorella et al. (2016)
		Stakeholders' perceptions (social benefits, governance modes and management)	Support policy- and decision-making processes	Sitens et al. (2016)
		Public participation process in the implementation of Natura 2000 Network	Support policy- and decision-making processes	Brescancian et al. (2018)
Social Network Analysis	Develop a method	Net-Map: European biodiversity knowledge network	Hauck et al. (2015)	
		The adapted version of the Policy Network Analysis (PNA) framework	Creutzburg & Lieberher (2021)	
	Understand the existing system	Forest owners' communication relationships in timber sales	Support policy- and decision-making processes	Korhonen et al. (2012)
		The existence of user interactions and impacts	Support policy- and decision-making processes	Keskkitalo et al. (2014)
		The structure of the cooperative network for forest Conservation	Support policy- and decision-making processes	Burg et al. (2015)
		Identify stakeholders, their preferences, and perceptions	Support policy- and decision-making processes	Auerhammer (2017)
		Interactions among forest stakeholders as a relevant factor for forest governance	Support policy- and decision-making processes	Sorniz-Másud et al. (2017)
		The influential/ most important actors, and their perception/ preference on future forest land use	Support policy- and decision-making processes	Auerhammer et al. (2018)
		The distribution and intensity of cross-border cooperation networks in interlocking sectors	Support policy- and decision-making processes	Mäkinen et al. (2018)
		Network governance, legitimacy and stakeholders' perceptions	Support policy- and decision-making processes AND Support participatory process	Schulz et al. (2018)
Actors involved, their interests, and emerging policy coalitions	Support policy- and decision-making processes	Korhonen et al. (2018)		
Stakeholder Analysis X Social Network Analysis	Develop a method	For public participation in forest planning	Paletto et al. (2012)	
		To measure the structural social capital	Support policy- and decision-making processes AND Support participatory process	Paletto et al. (2012)
	Understand the existing system	Identify/ classify stakeholder for participatory forest planning	Support policy- and decision-making processes AND Support participatory process	Paletto et al. (2015)
		Identify and classify stakeholders	Support policy- and decision-making processes AND Support participatory process	Grilli et al. (2015)
		Stakeholders perceptions (influence and real power)	Understand existing system	Paletto et al. (2016)
		SA to identify and classify stakeholders	Support policy- and decision-making processes	Pejuhan & Paletto (2020)
		To characterize the forest management context	Support policy- and decision-making processes AND Support participatory process	Marques et al. (2020)
		Identify stakeholders, their characteristics and from the network, perceptions (opinions and priorities)	Support policy- and decision-making processes	Blanc et al. (2018)
		Analyse participatory process	Improve existing system	Lakic et al. (2020)

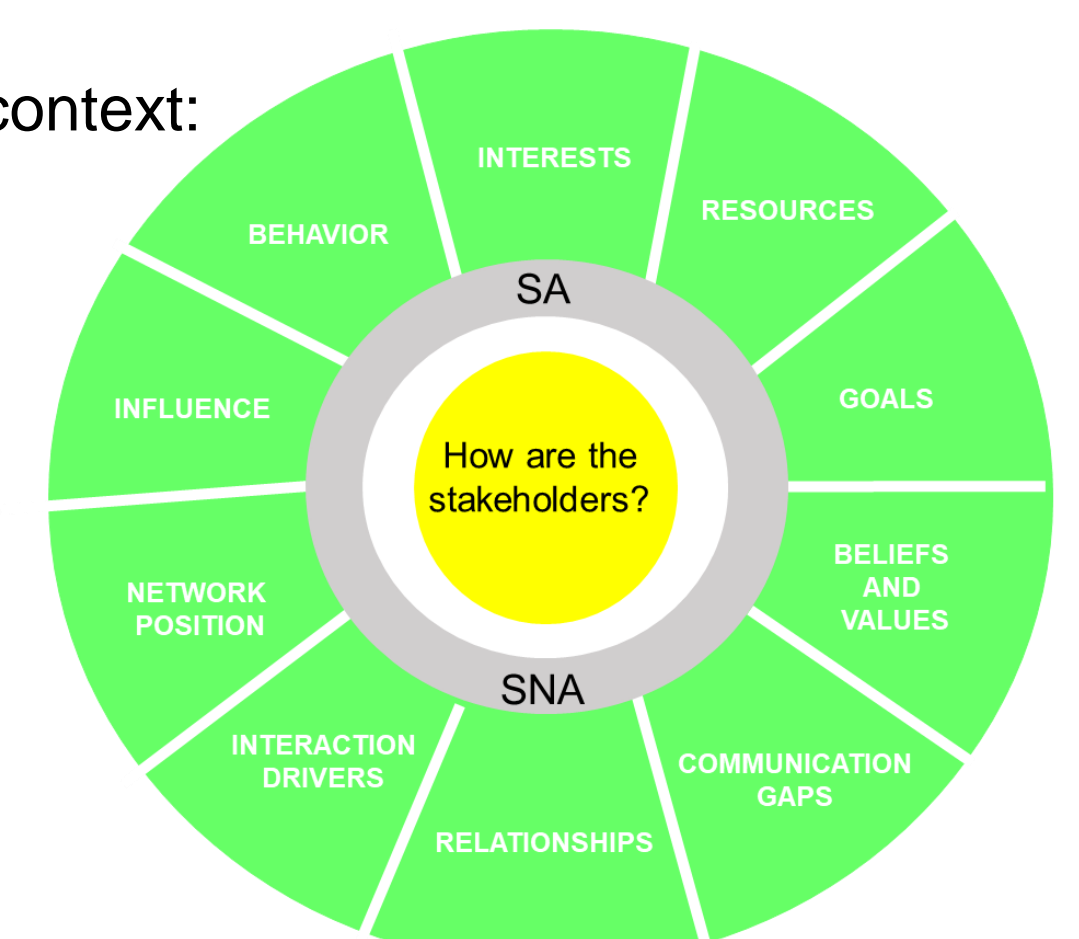
Table 1. Systematization of the articles by purpose and methodology.

Conclusions

- SA was mainly used to understand the existing system (stakeholders' perception) for supporting policy- and decision-making processes;
- SNA was principally used to understand the existing system (networks their relationships and interactions) for support policy- and decision-making processes;
- SA combined with SNA was mostly used to develop a method (to identify and classify stakeholders) for supporting policy- and decision-making processes and support participatory processes.

Directions for future research

- Taking the SLR results and the Portuguese context:
 - to select the cases studies,
 - the dimensions to analyze, and
 - the methods and approaches.



- Understand the Integrated Wildland Fire Management System (SGIFR)