forests

MDPI

Article

Climate Change Governance in Forestry and Nature Conservation in Selected Forest Regions in Serbia: Stakeholders Classification and Collaboration

Mirjana Stanišić [1,2], Marko Lovrić [3], Jelena Nedeljković [1,*], Dragan Nonić [1] and Špela Pezdevšek Malovrh [4]

[1] Department of Forestry and Nature Conservation, Faculty of Forestry, University of Belgrade, Kneza Višeslava 1, 11030 Belgrade, Serbia; mirjana.stanisic@sfb.bg.ac.rs (M.S.); dragan.nonic@sfb.bg.ac.rs (D.N.)
[2] Maastricht School of Management, Endepolsdomein 150, 6229 EP Maastricht, The Netherlands
[3] European Forest Institute, Yliopistokatu 6B, 80100 Joensuu, Finland; marko.lovric@efi.int
[4] Department of Forestry and Renewable Forest Resources, Biotechnical Faculty, University of Ljubljana, 1000 Ljubljana, Slovenia; spela.pezdevsek.malovrh@bf.uni-lj.si
* Correspondence: jelena.nedeljkovic@sfb.bg.ac.rs

Abstract: Climate change, with various economic, environmental and social consequences, is one of the greatest challenges faced by society. Climate change governance in forestry and nature conservation includes developing joint activities and collaboration among stakeholders that combine different interests, influences and competences at national, regional and local levels. This research aims to classify climate change stakeholders within the forestry and nature conservation sectors in Serbia. They are classified according to their interests and perceived influences. We analyze factors impacting the development of different areas for the collaboration by combining stakeholder analysis and social network analysis. A total of 103 representatives of civil society and public sector organizations in forestry and nature conservation at different governance levels with expertise in climate change participated in the survey. The results show that most civil sector organizations are distributed in the 'subject' quadrant with lower perceived influence and are not well interconnected. Seven different areas for the collaboration were identified, with disconnected stakeholders and limited representation and mostly peripheral position of civil society organizations (except in the case of the area for the collaboration through workshop and seminars knowledge exchange). The analyzed factors have different positive and negative effects on the development of the different areas for the collaboration, with the frequency of contacts standing out as a significant factor of collaboration at the level of the whole collaboration network. There is a strong indication of a centralized, top-down approach to climate change governance in forestry and nature conservation in Serbia. Multilevel and horizontal stakeholder governance is needed to achieve effective implementation of strategic climate-change policy commitments. The most important step to achieve such a structure is the empowerment of local-level organizations in climate change collaboration.

Keywords: climate change; forestry; stakeholders; classification; area of the collaboration; multilevel governance; Serbia

Citation: Stanišić, M.; Lovrić, M.; Nedeljković, J.; Nonić, D.; Pezdevšek Malovrh, Š. Climate Change Governance in Forestry and Nature Conservation in Selected Forest Regions in Serbia: Stakeholders Classification and Collaboration. *Forests* **2021**, *12*, 709. https://doi.org/10.3390/f12060709

Academic Editor: John Innes

Received: 23 April 2021
Accepted: 27 May 2021
Published: 30 May 2021

1. Introduction

Climate change is manifested worldwide by an increase in the frequency and intensity of extreme events, a rise in temperature, changes in the intensity and amount of precipitation [1] and negatively affects natural resources [2,3]. In the last two decades, large-scale forest fires occurred in Europe [4–6], accompanied by the long dry periods and intense winds in the Mediterranean region [7–9]. Notable consequences of climate change

in Serbia are the increase in average annual temperature, reduced precipitation, occurrence of floods, droughts, forest fires and ice breaks [10–13], with uneven occurrence and distribution across the country.

By managing risks from extreme events and disasters, the governance of climate change requires, among other things, "new ways of thinking about social contracts, which describe the balance of rights and responsibilities between different parties" [14] (p. 465). Because climate change affects not only natural resources, forests, and forest ecosystems but also "many different sectors, strategies, actors" (p. 21), there is a need for a "broad variety of approaches and solutions" (p. 11) in applying different forms of governance, policies, and programs [15] (p. 21) (p. 11). Consequently, different governance approaches have been developed and analyzed over time, such as multilevel governance [16–19], and network governance [20–22].

Governance in the context of collective action can be seen as a dimension of commonly established norms and rules intended to regulate the behavior of individuals and groups [23]. Although governance aims to address the issues of influence, accountability and voice of citizens and other actors [24], in a more traditional hierarchical relationship, state actors can be the "subject of control" and society actors the "object of control" [25]. The process of decentralization of government and the associated change in the roles of the civil and private sectors, including in the decision-making process [20], initiated a shift from executive and top-down control to more diffuse policy networks [26] reflecting the development of network, multilevel and collaborative governance concepts.

A number of definitions of network governance, as stated by Jones, follow two concepts—one refers to the patterns of interaction in exchange and relationships, while the second refers to the flow of resources [27]. The concept of network governance refers to interdependence as the core factor that initiates and sustains networks, the presence of interactions and complexity of many actors, institutional characteristics (as patterns of power relations, interactions) and patterns of rules [22].

Network governance "sought to improve coordination between government departments and the multifarious other organizations" [22] (p. 1246), and involves "a select, persistent and structured set of autonomous firms (as well as no profit agencies) engaged in creating products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges" [25] (p. 914). Policy networks, which are focusing on, among others, the question on which actors are involved in the decision-making process and their relations, are also based on the concepts of network governance [22]. When applying the concept of network governance, a positive influence on communication and information sharing [28] and knowledge exchange between different stakeholders in the network [29] was found.

Multilevel governance emerged in the context of cohesion policy reforms and the analysis of the European integration process and can be seen as a "system of continuous negotiation among nested governments at several territorial tiers" [30], (p. 392). Tiers, in this particular definition mean supranational, national, regional and local authorities, emphasizing the increasing interdependence of governments operating at different territorial levels and the presence of horizontal and vertical dimensions in governance as an effect of the increasing interdependence between state and nonstate actors [31].

Multilevel governance refers to the distribution of power between different levels of administration (vertically), but also between different stakeholders (horizontally), including the private and civil sectors [31]. It implies capacity development and the creation of different systems of collaboration with different stakeholders and the harmonization of their interests at all levels [32,33], as well as the creation of linkages and the exchange of information on natural resources between different stakeholders at different levels of governance [34]. In order for climate change issues to be integrated into multiple sectors and levels of governance, interactions and linkages between institutions at different levels and sectors involving different stakeholders and collaboration are necessary. In relation to the

climate change governance strategies, mentioned levels are addressing national, regional and local levels [34].

Some of the common features of the governance approaches mentioned above are the involvement of various stakeholders at different levels of governance in the policy-making process [35,36] and their collaboration, including the tendency towards less formal governance approaches [37,38].

Climate change governance involves many systemic activities aimed at solving various climate change mitigation and adaptation problems, with a cross-sectoral approach to coordinate activities at different levels of governance [39–41].

Climate change governance involves various stakeholders from the public, private and civil sectors [15], such as state institutions and organizations (government, ministries and other state organizations), business organizations and enterprises, educational and research organizations, civil society [42] and nongovernmental organizations (NGOs) [15], with different competencies, interests and responsibilities [41,43–45]. The situation is not different in the forestry and nature conservation sector in the SEE region, namely in Slovenia, Croatia, Bosnia and Herzegovina and Serbia, where the following public and civil sector institutions and organizations have competences related to climate change at different levels of governance: public administration in forestry and nature conservation; public services; enterprises and organizations for state forest and protected area management; educational and research organizations; and civil society organizations [45,46]. In all four countries mentioned above, there are only minor differences in the organizational structure and related climate change competencies of the institutions and organizations. However, they all share a common challenge, namely the need for a shift from a top-down to a bottom-up approach to natural resource governance [46,47]. This means that public sector institutions and organizations play a central role, while private and civil society organizations are less involved. Consequently, there is a need to improve communication with other institutions and organizations in climate change governance [46], and there is also a need for a systemic, organized collaboration and communication system between organizations at the national, regional and local governance levels [45]. This study can provide useful insights for further research on climate change governance in forestry and nature conservation in other countries whose economies are in transition and need to achieve effective implementation of international climate change policy commitments.

Establishing stakeholder collaboration at national, regional and local governance levels is also one of the essential elements to achieve national priorities in the fight against climate change [48], which can contribute to the creation and sharing of knowledge among different stakeholders [49], but also implies the sharing of responsibilities [50]. Stakeholders can be defined as the groups that have an interest, or stake, in the decision-making process, but that have relatively few means to influence decision-making or the system [51] (p. 80). Actors can be defined as a "social entity, person or organization, able to act on or exert influence on a decision" [51] (p. 80), present "parties with a certain interest in the system and ability to influence it, directly or indirectly" [51] (p. 80). The difference between actors and stakeholders can also be seen through their ability to act on or exert influence on a decision.

Many authors addressing natural resource management from the perspective of Stakeholder Analysis (SA) [52–56] and climate change mitigation and adaptation [41–43] emphasize the diversity of stakeholders for natural resource management and governance. Stakeholders in climate change governance include a wide range of international to diverse state and nonstate stakeholders, from public sector institutions and organizations to academia, business, NGOs and community stakeholders [57]. In addition to the central role of state stakeholders in climate policy, nonstate stakeholders, namely NGOs, have played a more prominent role in climate change in the last decade [58,59]. However, stakeholder engagement in climate change issues differs by level of governance, with possibly more intense engagement of national-level stakeholders in climate change mitigation, while local stakeholders are more involved in adaptation [19].

Given the diversity of stakeholders, there is a need to classify them through an (perceived) influence and interest analysis to better characterize their role in the policy process and more adequately represent them in decision-making processes. Stakeholder interest and (perceived) influence analysis provides a clearer picture of stakeholder relationships [52,60–62] and opportunities to harmonize their interests [32,63] in natural resource and climate change governance.

SA allows the identification and classification of stakeholders, but also the mapping of interactions between stakeholders in the network [52], while the study of social networks allows the identification of structural features of networks and different elements that can influence their collaboration [64,65].

Social Network Analysis (SNA) provides an understanding of the formal and informal networks of stakeholder collaboration in forest biodiversity conservation [61] and multilevel climate change governance [66]. It helps uncover knowledge and structures that influence local community engagement in climate change adaptation policy [67] and barriers to stakeholder communication and collaboration in multilevel climate change governance [19]. SA and SNA provide a clearer picture of the relationships and areas for the collaboration between different stakeholders and different factors that influence their relationships in the context of climate change governance.

In relation to the above, this paper aims to classify stakeholders and analyze their collaboration in climate change governance in forestry and nature conservation combining SA and SNA approach to (a) identify differences in stakeholder interest and perceived influence in climate change governance, (b) identify and analyze areas for the collaboration, and (c) determine the effect of different factors (governance level affiliation; interest and perceived influence in climate change governance; sector affiliation; statistical region affiliation; frequency of contacts; central position in the network) on the development of areas for the collaboration in state forests.

To the best of our knowledge, a limited number of studies [44,56,63,68] have examined stakeholder classification and areas of collaboration in climate change governance in forestry and nature conservation in Serbia and other countries in Southeastern Europe.

The results could help inform all stakeholders involved in climate change governance in forestry and nature conservation about the challenges of collaboration, factors influencing collaboration, and potential opportunities to improve the collaboration process in the future. They can also provide useful insights into the existence of connections between different stakeholders in forestry and conservation in climate change governance, and the opportunity to further share knowledge and build trust with each other.

2. Analytical Framework

To bring together the classification of stakeholders and analyze stakeholder collaboration in climate change governance in forestry and nature conservation, we would first like to refer to the definition of collaboration. Collaboration can be defined as a "process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision on what is possible" [69] (p. 5).

This chapter further briefly reviews the application of SA and SNA, including the rationale for combining the two approaches.

2.1. Stakeholder Analysis (SA)

SA was first used in political science and management and has gained prominence over time to be applied in other sciences [70].

SA refers to "an approach for understanding a system by identifying the key actors or stakeholders in the system and assessing their respective interests in that system" [71] (p. 3), while also uncovering "who these interested parties are, who has the power to influence what happens, how these parties interact, and based on this information, how they might be able to work more effectively together" [52] (p. 1947).

Because social stakeholders generally have a need to influence the behavior of others in order to achieve their goals [60], SA analysis provides an opportunity to gain more knowledge about perceived influence, which can be defined as ability to affect other stakeholders "behaviors or beliefs by effectively controlling resources (e.g., information, ability to make decisions, etc.), skillfully and willfully" [72] (p. 462). By implementing SA, one can create knowledge about the relevant stakeholders so as to "understand their behavior, intentions, interrelations, agendas, interests, and the influence or resources they can bring to bear on the decision-making processes" [70] (p. 241).

As for natural resource management, SA was first used in developing countries [73,74]. Over time, it gained importance due to the growing need to increase transparency and give different stakeholders a role in the decision-making process [52,53,70]. This analysis can be helpful in "investigating existing and potential collaborative relationships between stakeholders" in addressing various environmental and natural resource-related challenges [52] (p. 1944).

SA can be applied with different methods and approaches to identify stakeholders, classify them and consider their relationships [52]. Stakeholder classification based on interest and (perceived) influence matrices has been explored by several authors, such as in the case of stakeholder mapping for biosecurity governance [54], participatory decision-making process in forestry [60], ecosystem service provision [55], or infrastructure planning in water management [75].

2.2. Social Network Analysis (SNA)

Moreno's work (1934) can be seen as the origin of social network analysis, where the points and lines represent social networks [76,77]. Further development was initiated in the late 1970s, using algebra to explore power and influence in banks and to study community structures [77]. Based on the work of Moreno, the formal basis of SNA is a graph theory [78], where in the context of SNA social stakeholders (which can be individuals, groups or organizations) are represented by points, and relations between them are represented by lines (ties or links). Network analysis can measure a number of parameters, such as the overall density of the network [79] and relative centrality, which is used as an indicator of influence [80]. From its early beginnings, the application of SNA can be seen in the field of policy networks [64], scientific collaboration [81], economics [82] among others.

The social network represents a social system of relations characterized by the set of stakeholders and their social ties [76], where the links between stakeholders can be information, behaviors, goods or the mediation of shared attitudes [83]. SNA, which includes various methods, is used to study stakeholders within their existing social ties, but also in analyzing the tie structure between specific stakeholders in terms of the overall network between all stakeholders [53,76]. Due to the diversity of stakeholders in multilevel and network governance, many authors have used SNA in the study of stakeholder collaboration in natural resource governance [38,49,53,56,61,62,75,84,85].

SNA has been used in the study of collaborative relationships between different stakeholders and sectors at multiple levels in water management [38] in the analysis of agricultural community networks in terms of knowledge creation and sharing [49] in the study of formal and informal governance networks in terms of information sharing, social cohesion and shared interests in biodiversity collaboration [61], in the study of communication patterns in resource use [84], and in the mapping of bioeconomic forest research [85].

2.3. Combining SA and SNA

The main proposition of SNA is that the primary answer to a research question lies in the ties between the units of observations and not within units of observation. The opposite is true for SA. Thus, the former abides to the relational perspective in social sciences and the latter to the substantial one. This dialectic also highlights the main strengths and

weaknesses of each of the two approaches, i.e., SNA does not adequately capture the parts that are intrinsic to the units of observation and SA cannot adequately capture social structure. Research related to the stakeholder analysis did not consider the influence of stakeholders beyond the dyadic level, whereas network analysis provides means of examining how the relationship patterns influence organizational behavior. Thus, the use of SA provides a clear picture of the stakeholders themselves as well as the interests and perceived influences of the stakeholders [53]. However, this type of analysis does not contribute to a clear picture of the relationships, roles and connections of each stakeholder. A number of researchers suggested using SNA to examine stakeholder network structure and how the position of stakeholders could influence the organization [19,49,53,86–88]. The study [53] combined SA and SNA approaches and, in addition to identifying stakeholders, examined the structural elements of the network and the stakeholders' participation and positions in it. Measurement of strong and weak ties, centrality, homophily and centralization led to a better understanding of which stakeholders hold central roles within the network. On that way, stakeholder participation in the network as well as central (or not) position in the network were identified. In the study of [19] measurement of homophily and centrality in the context of communication and collaboration on multilevel of governance in climate change, provided information on imbalance of power distribution within stakeholders. In the study of [49], network structure measures as density, centrality and betweenness, provided information on network structure and position of the stakeholders within, in light of further improvement in knowledge sharing. In this paper, the combination of SA and SNA approaches not only provides the opportunity to classify stakeholders based on interest and perceived influence in climate change governance, but also provides a detailed analysis of the impact of different factors (governance level; interest and perceived influence in climate change governance; sector affiliation; statistical region affiliation; frequency of contacts; network centrality position) in relation to the areas for the collaboration between different stakeholders, in forestry and nature conservation in climate change governance.

3. Materials and Methods

The research was conducted in the Republic of Serbia, excluding Autonomous Provinces (AP), in two statistical regions: (1) Šumadija and Western Serbia and (2) Southern and Eastern Serbia. These statistical regions account for 39.1% of the total forest damage in state forests caused by natural disasters in Serbia [12]. Within the mentioned statistical regions, a survey is conducted in 11 forest regions (FR) where the share of damage caused by natural disasters (with emphasis on harmful effects of water, wind and fire) exceeds 1% (per area). On the territory of 11 FRs, a total of 33 municipalities were selected that met the following criteria: (a) location of Forest Estate offices (FE) and Forest Management Units (FMUs); (b) reporting of state forest damage due to forest ice breakage. Because the three national parks (NP) are located in the territory of the selected statistical regions, the municipalities where the headquarters of public enterprises (PE) managing National Park Kopaonik, National Park Tara and National Park Đerdap are located were also selected. Map of the research area is presented in Figure 1.

The research is conducted using a mixed-method approach, combining qualitative and quantitative research methods.

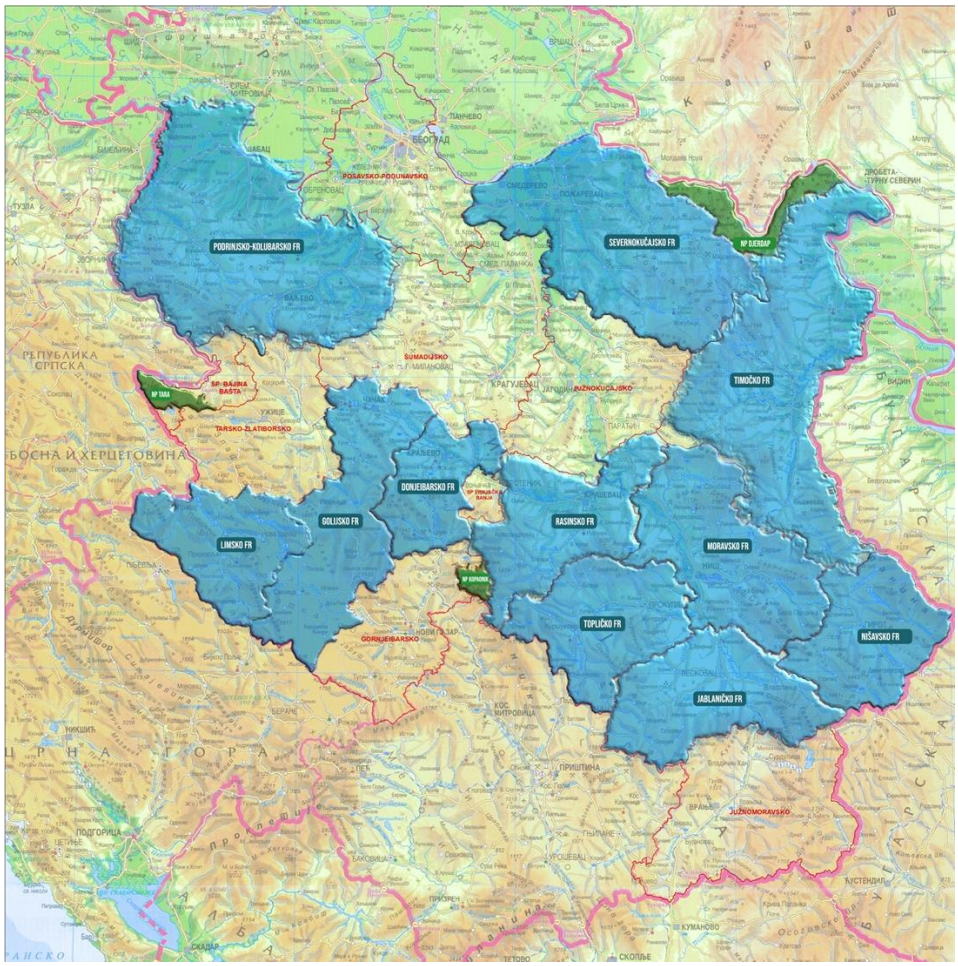


Figure 1. Map of the research area.

3.1. Defining Respondents

The study focuses on organizations as the unit of analysis, namely forestry and nature conservation that have a stake in climate change issues. The territorial framework of the study focuses on the regional and local level of governance in 11 FRs in Serbia. The following organizations with climate change competencies in forestry and nature conservation were selected: (1) public sector—(a) public enterprise (PE) for state forest management "Srbijašume" (PE "Srbijašume"); (b) PE for management of protective forests of Vrnjačka Banja "Šume-Goč" (PE "Šume-Goč"); (c) public enterprises national parks (PE NPs); (d) local self-government (LS): city and municipality administration and (2) civil sector (NGOs), following the classification of [45]. Due to the territorial scope of the study, organizations at the national level of governance in forestry and nature conservation with climate change competencies were not selected.

A purposive sampling method was used [89]. Information-rich and knowledgeable respondents about inter-organizational relationships in forestry and nature conservation with climate change competencies at regional and local governance levels were selected. These include staff with senior positions in organizations or organizational units: directors FEs and heads of FMUs; directors and deputy directors of PE NPs; heads of departments, divisions and services for environmental protection, environmental control and inspection; economic development consultants; independent professionals and inspectors of local self-government; and directors or managers of NGOs. All respondents hold high positions within the organizational hierarchy, which allows them to answer the questions from the perspective of the organization and its interest in climate change governance.

Representatives from the private sector of forestry and nature conservation were not selected because the study focuses on state forest damage caused by natural disasters.

In contrast to state forests, information on forest damages caused by natural disasters is lacking for private forests. There is also a lack of official registers and detailed information on private forest owners, including reliable information on the area of private forests in all selected regions. Small and medium enterprises in forestry are only users of forest products and therefore not relevant for this study.

An overview of the number and structure of respondents by sector, organization and statistical region is presented in Table 1.

Table 1. Structure of the respondents by sector, organization and statistical region.

Sector	Organization	Statistical Region		Total
		Šumadija & Western Serbia	Southern & Eastern Serbia	
Public sector	Public enterprise for state forest management "Srbijašume"	14	20	34
	Public enterprise for management of protective forests of Vrnjačka banja "Šume-Goč"	2	-	2
	Public enterprises national parks	5	1	6
	Local self-government	14	20	34
Civil sector	Nongovernmental organizations	10	17	27
		45	58	103

3.2. Data Collection

After the initial telephone contact with the respondents and explanation of the research purpose, a "face-to-face" survey was conducted with 99 respondents, while four respondents completed the questionnaire electronically. The total number of respondents was 103 and the data was collected between March 2017 and July 2019. The most extensive damage to forests from natural disasters occurred in 2014/2015, with no recurrence on a similar scale during the data collection period.

The questionnaire consisted of six sections related to the following topics: (1) attitudes towards climate change; (2) strategic and legal framework of forestry and nature conservation with special reference to climate change; (3) institutional framework of forestry and nature conservation with special reference to climate change governance competencies; (4) identification of stakeholders, their interest and perceived influence on climate change governance; (5) organization of collaboration in climate change governance in forestry and nature conservation; (6) support measures in climate change governance.

The questionnaire consisted of 32 questions (a combination of open and closed questions). For this paper, the responses to six questions related to stakeholder classification and collaboration in climate change governance were analyzed (Sections 4 and 5).

In the fourth section, before the classification of stakeholders, respondents specified other organizations (stakeholders) with climate change competencies in forestry and nature conservation. The following questions have been used:

Q19: Please specify stakeholders (individuals, institutions, organizations, state enterprises, civil associations, NGO's and others) performing work and/or activities or on any other way are achieving their interests in forestry and nature protection.

Q20: Were any of specified stakeholders, involved in the climate change governance (Y/N).

If the answer is yes, please indicated how.

Q21: Please indicate other stakeholders, involved in the climate change governance and indicate interest and (perceived) influence of all specified stakeholders.

All respondents were provided with explanation on current interest and perceived influence in relation to climate change governance decision making.

Respondents rated the interest and perceived influence on climate change governance in forestry and nature conservation of the specified organizations using a five-point Likert scale: (1) very low; (2) low; (3) neither low nor high; (4) high; (5) very high.

In the fifth section, respondents were asked to indicate the existence, areas for the collaboration, and frequency of contacts with other stakeholders in forestry and nature conservation related to climate change. The following questions were used:

Q23: Please specify with which stakeholder(s) performing work and/or activities in forestry and nature protection you collaborate with concerning climate change governance related issues.

Q23(a): Please specify areas for the collaboration in climate change governance (open question).

Q23(b): Please specify how often you are in contact in relation to mentioned areas of the collaboration.

Respondents were provided with additional information on the definition of climate change governance in Section 1 of the same questionnaire.

Respondents could add missing stakeholders to the list within Q23. The questions on existence and areas for the collaboration were open-ended, while the questions on frequency of contact included a choice between daily, weekly, monthly, quarterly, and annual frequency of contact.

The survey took an average of 45 min to complete.

3.3. Data Analysis

After aggregating a list of all specified organizations (stakeholders) and the results of the assessment based on the respondents perceived perception, the interest and perceived influence matrix was constructed, as a commonly applied method to categorize stakeholders within its four quadrants—"subjects", "key players", "crowd", and "context setters" [52,80,90]. The interest and perceived influence matrix was constructed according to the average value of interest and perceived influence obtained from the responses of all respondents. The x-axis represents the value of perceived influence and the y-axis represents the value of interest.

Stakeholders are distributed in a (two-dimensional) coordinate system in one of four quadrants and classified as "subjects", "key players", "crowd", and "context setters" [52,80,90]. Stakeholders in the "subjects" and "key players" quadrant have the most interest in the issues at stake or the related context, while the stakeholders in the "key players" quadrant have more perceived influence in supporting (or not supporting) the issues at stake compared to the "subjects". The stakeholders in the "context setters" quadrant do not have much interest but may have sufficient perceived influence over the issues at stake, while the stakeholders in the "crowd" quadrant have neither the interest nor the perceived influence on associated context and its outcome [90].

In this case, the matrix of stakeholder interest and perceived influence provides the analyst with perception-based data from stakeholders in selected statistical regions in Serbia. Therefore, the results are not necessarily transferable to other parts of Serbia and do not necessarily reflect the actual interest and influence of organizations on policy decision-making in the field of climate change governance.

Furthermore, the collaboration network ties between the respondents and other organizations in the field of climate change governance in forestry and nature conservation are explored through SNA.

The MS Excel was used to process and analyze the respondents' assessments of the interest and perceived influence of the specified stakeholders in the field of climate change governance, and to create the interest and perceived influence matrix.

An SNA computer program, UCINET (version 6.694), was used to analyze the area and frequency of contacts [91], while NetDraw was used to graphically represent the collaboration networks [91].

Multidimensional scaling analysis (MDS) is applied to assign the same position to the stakeholders in the multidimensional space, positioning similar stakeholders closer to each other. The output of the MDS analysis is used as an attribute in the graphical representation of all collaboration networks in NetDraw. The Multiple Regression Quadratic Assignment Procedure (MRQAP) is applied to examine the links between stakeholders in forestry and nature conservation by areas of collaboration (dependent variable) and independent variables (level of governance, value of interest and perceived influence in climate change governance, sector affiliation, statistical region affiliation, frequency of contacts, centrality of position in the network) in terms of the tendency to form collaboration ties. All values of the variables were recoded into the binary system, as shown in Table 2.

Table 2. Variable coding overview.

Variable	Value	Code
Frequency of contacts	Daily and weekly	1
	Monthly, quarterly, yearly	0
Interest in climate change governance	Same interest value	1
	Different interest value	0
Perceived influence on climate change governance	Same perceived influence value	1
	Different perceived influence value	0
National governance level	Same level affiliation	1
	Different level affiliation	0
Regional governance level	Same level affiliation	1
	Different level affiliation	0
Local governance level	Same level affiliation	1
	Different level affiliation	0
Statistical region	Same region affiliation	1
	Different region affiliation	0
Public sector	Same sector affiliation	1
	Different sector affiliation	0
Civil and private sector	Same sector affiliation	1
	Different sector affiliation	0
Central position in the network	Yes	1
	No	0

4. Results

Stakeholder classification is based on an aggregated list of 27 (statistically significant) stakeholders from the public, civil and private sectors with climate change competencies in forestry and nature conservation at all levels of governance. Overview of specified stakeholders is provided in the Appendix (Tables A1 and A2). Stakeholders are classified according to their interest and perceived influence on climate change governance, as shown in the interest and perceived influence matrix (Figure 2). The results presented regarding the position of stakeholders in the interest and perceived influence matrix (Figure 2) should be viewed with caution and cannot be generalized because private sector representatives were not included in the dataset as the research focused on state forests.

Organizations on the national level as presented in the Figure 2 are as follows: Ministry of Environmental Protection (MEP); Ministry of Agriculture, Forestry and Water Management—Directorate of Forests (MAFWM-DF); Ministry of Interior (MI); Ministry of Mining and Energy (MME); The University of Belgrade—Forestry Faculty (UB-FF); The

University of Belgrade—Faculty of Biology (UB-FB); Institute for Nature Conservation of Serbia (INCS); Institute of Forestry, Belgrade (IF).

Organizations on the regional level are as follows: PE "NP Tara", Bajina Bašta; PE "NP Đerdap", Donji Milanovac; PE "NP Kopaonik", Kopaonik (PE NPs); PE "Srbijašume"—Forest Estates (PESS). Organizations on the local level are as follows: City administration (CG); Municipal administration (MG); Village communities (VC); City departments and municipal divisions for emergency management (DDEM); City Institutes for Public Health (CIPH); Primary and Secondary Schools (PSS); PE "Srbijašume"—Forest Management Units (PESS); Public Enterprise "Elektroprivreda Srbije" with local branches (PUEH); Public Water Estate "Srbijavode", Belgrade (PWESV); Public Utility Enterprise for Greenery (PUEGREE); Local environmental NGOs (NGOs); Timočki klub, Knjaževac (NGOKNJ); Pokret gorana Srbije (NGO GOR); Mountaineering Associations (MA); Hunting associations (HA); Associations of private forest owners (APFO); Private forest owners (PFO).

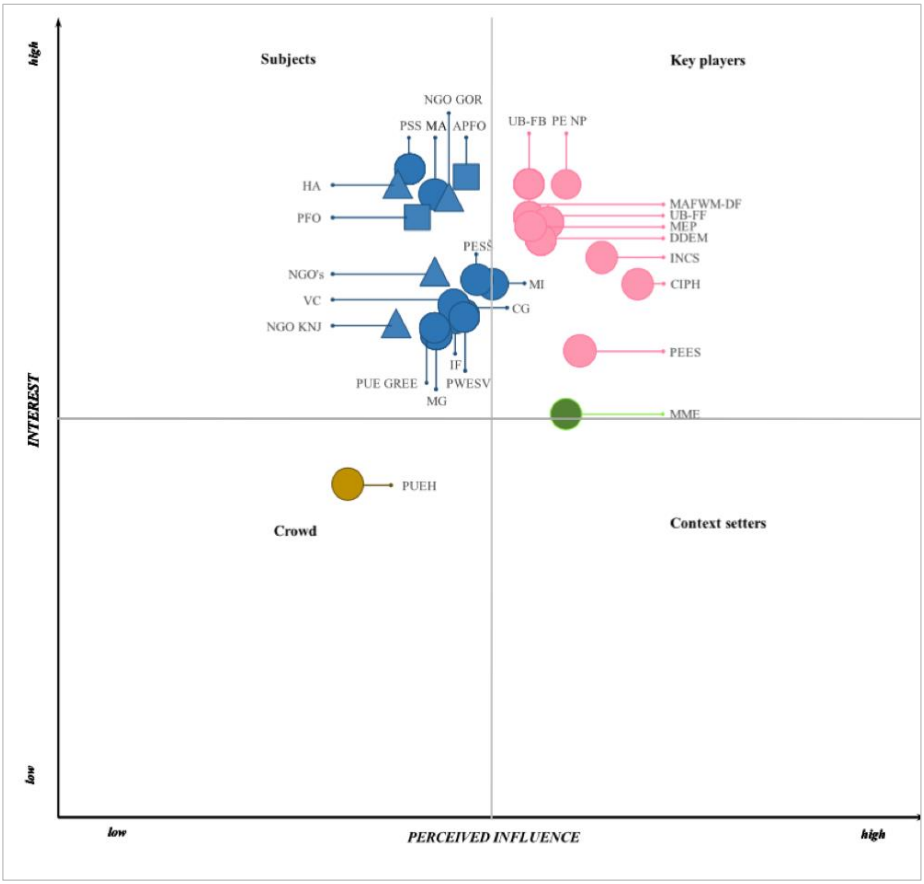


Figure 2. Matrix of stakeholders' interest and perceived influence in climate change governance. Color of the circle reflect position in the quadrant (subjects—blue color; key players—pink color; context setters—green color; crowd—brown color). The shape of the symbol reflects the sector affiliation (circle—public sector; triangle—civil sector; square—private sector).

Most stakeholders are positioned in two quadrants—"subjects" and "key players", while there is only one stakeholder at the boundary between the "key players" quadrant and the "context creators" quadrant—the Ministry of Mining and Energy (MME).

Stakeholders in the "subject" and "key players" quadrants have a high level of interest, but there is a visible difference in their perceived influence on climate change governance.

Overview of the stakeholders in the "key players" quadrant, is presented in the Table 3.

Table 3. Stakeholders overview in the "key players" quadrant.

Public Sector		
Group		**Stakeholders in the "Key Players" Quadrant**
Public administration and local self-government:		Ministry of Agriculture, Forestry and Water Management—Directorate of Forests (MAFWM-DF) Ministry of Environmental Protection (MEP) Ministry of Interior—Sector for emergency management (MI) City departments and municipal divisions for emergency management (DDEM)
Agencies and institutes		Institute for Nature Conservation of Serbia (INCS) City Institutes for Public Health (CIPH)
Education and research organizations		The University of Belgrade—Forestry Faculty (UB-FF) The University of Belgrade—Faculty of Biology (UB-FB)
PE	PE NPs	PE "NP Tara", Bajina Bašta; PE "NP Đerdap", Donji Milanovac; PE "NP Kopaonik", Kopaonik;
	Other PEs	PE "Elektroprivreda Srbije" branch HE "Đerdap", Kladovo; branch Drinsko-Limske HE, Bajina Bašta (PEES)

In terms of governance level, the stakeholders in the "key players" quadrant belong to the national level, with the exception of the PE NPs, which are located at the regional level, while the City Institutes of Public Health (CIPH)—namely city and municipal departments and the departments and divisions of Emergency Management (DDEM)—are located at the local level.

Stakeholders from the civil and private sectors are not represented in the "key players" quadrant, but in the "subjects" (lesser interests) quadrant, along with several organizations from the public sector (Table 4).

Table 4. Stakeholders overview in the "subject" quadrant.

Public Sector		
Group		**Stakeholders in the "Subjects" Quadrant**
Public administration and local self-government		Ministry of Interior—sector for emergency management (MI)
		City administration (CG) Departments, divisions, and services for environmental protection Departments, divisions, and services for environmental control and inspection
		Municipal administration (MG) Departments and divisions for environmental protection Departments, divisions, and services for environmental control and inspection Departments and division for economic development
		Village communities (VC)
Education and research organizations		Primary and Secondary Schools (PSS)
		Institute of Forestry, Belgrade (IF)
PE	PE for state forest management	PE "Srbijašume"—forest estates (FE) and forest management units (FMU)
	Other PE's	PUE for Greenery (PUEGREE)
		PWE "Srbijavode" (PWES)
Civil Sector		
Environmental NGOs		Pokret gorana Srbije (NGO GOR)
		Local environmental NGOs (NGO)
		Timočki klub, Knjaževac (NGOKNJ)

Citizens associations	Business and professional associations	Hunting associations (HA)
Private Sector		
Private forest owners (PFO)		Associations of private forest owners (APFO)
Physical persons		

Respondents emphasized that lack of professional staff, inadequate information sharing at the level of FEs and FMUs with the Ministry of Agriculture, Forestry and Water Management—Directorate of Forests (MAFWM-DF), as well as insufficient harmonization of laws and lack of joint activities, are the reasons that reduce the perceived influence of stakeholders in climate change governance.

However, a survey shows the interest of many organizations at the regional and local level to strengthen their perceived influence in climate change governance, for example by forming alliances or partnerships with "key players" or the "crowd".

One stakeholder, the public utility enterprise "Toplane" from Belgrade (PUEH), is in the "crowd" quadrant (low perceived influence, low interest). This particular stakeholder plays a role related to the use of biomass (pellets) for heating. Their potential engagement and collaboration with "subjects", i.e., stakeholders at the local level, could have a positive impact on increasing their interest and perceived influence.

At the border of the "context creators" quadrant is the MME. As "context creators" represent stakeholders who can significantly influence the governance of climate change, strengthening these particular stakeholders would be desirable. For example, greater collaboration with public, private, and civil society organizations working on renewable energy issues, implementation monitoring, and environmental remediation could positively influence their increasing influence and transition into the "key players" quadrant. In this case, their involvement in the exchange of information and activities related to climate change governance would be essential.

4.1. Analysis of Collaboration Network

All 103 respondents indicated other stakeholders with which they collaborate. Of the 27 stakeholders reported, collaboration with City Institutes for Public Health (CIPH) and Private Forest Owners (PFOs) is not specified. Consequently, SNA resulted in a collaboration network consisting of 128 stakeholders from the public and civil sectors from all governance levels (national, regional and local). The list of all stakeholders is in Tables A3 and A4.

The obtained results of connections between stakeholders at the level of the whole network range from 1 to 70, while the eigenvector centrality (measure of the overall centrality of stakeholders in the network, taking into account indirect relations as well) varies from 0.002 to 0.22 (mean is 0.071), with a network density of 0.124. Because the network density result indicates the existence of fewer linked groups of stakeholders within the whole collaboration network, the core-periphery analysis was applied. The result of the core-periphery analysis shows that 40 "central" stakeholders from all three levels of governance are maximally interconnected. Only one organization from the civil sector—NGO for advocacy and public policy—Standing Conference of Towns and Municipalities (SCTM) has a "central" position in the collaboration network. A visual representation of the collaboration network in climate change governance in forestry and nature conservation is shown in Figure 3.

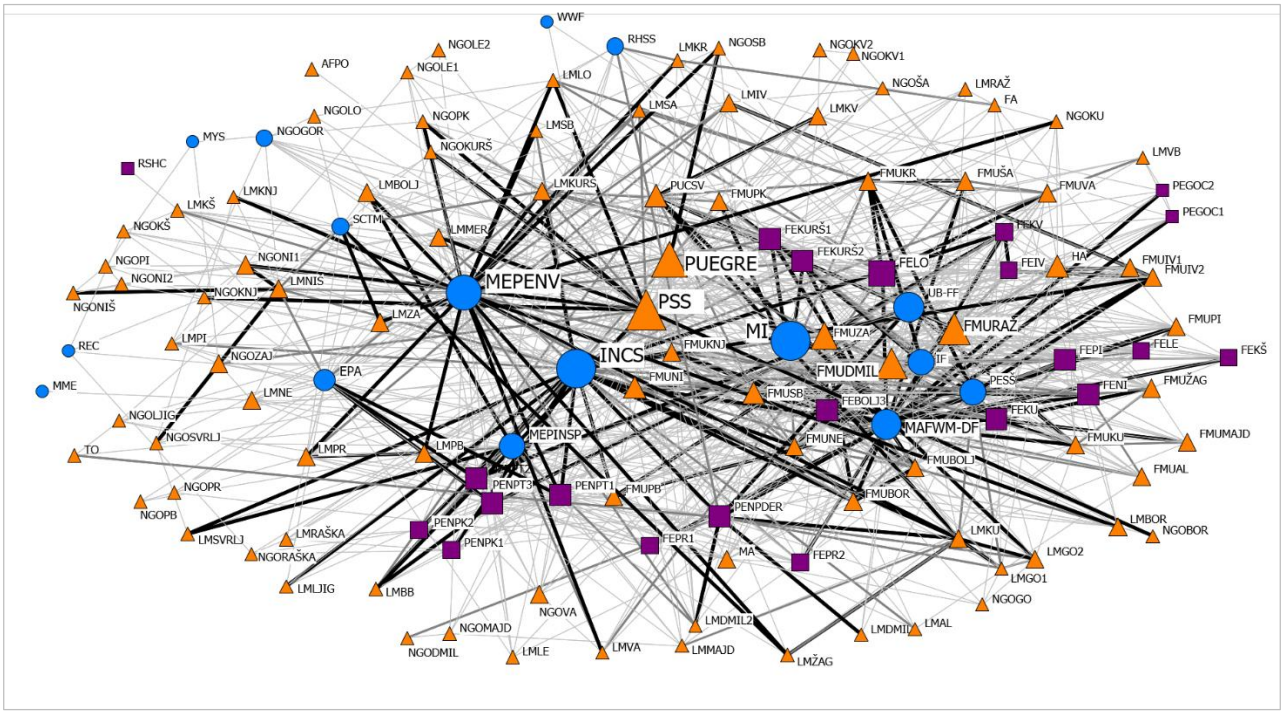


Figure 3. Collaboration network in climate change governance in forestry and nature conservation. A graph is in multidimensional scaling layout (MDS) as defined by UCINET. More connected organizations are displayed close to each other; orientation (left–right; top–bottom) is arbitrary. The shape and color of the organizational symbol reflect governance level (national level—circle, blue color; regional level—square, purple color; local level—triangle, orange color). The size of the organizational symbol and label is in proportion to the results of their tie range. Tie thickness and color are scaled according to the frequency of contacts. The highest tie thickness in black color represents daily and weekly contact frequency, highest thickness in grey color represents monthly contact, whereas thin grey ties represent quartal and yearly frequency of contact.

As visually presented in the Figure 3, the following organizations are standing out: From the national level: Ministry of Environmental protection—Sector for Environmental Governance (MEPENV), Institute for Nature Conservation of Serbia (INCS), Ministry of Interior (MI). From the regional level, those are as follows: PE "Srbijašume"—FE "Boranja" (FELO), PE "Srbijašume"—FE "Toplica" (FEKURS), FE "Srbijašume"—FE "Timočke šume" (FEBOLJ), PE "NP Tara", Bajina Basta (PENPT). From the local level: Public Utility Enterprise for Greenery (PUEGRE), Primary and Secondary Schools (PSS), PE "Srbijašume—FE "Rasina"—FMU Ražanj (FMRAŽ), PE "Srbijašume"—FE "Timočke šume"—ŠU "Donji Milanovac" (FMDMIL).

4.2. SNA per Areas for the Collaboration

Based on respondents' answers regarding the areas for the collaboration in climate change with other stakeholders, the following networks of areas for the collaboration are distinguished:

1. Remediation of forest damages from ice breaks, floods, and fires (Area 1);
2. Workshops, seminars and expert knowledge exchange (Area 2);
3. Tree planting, waste disposal and green space maintenance (Area 3);
4. Project-related activities (Area 4);
5. Climate-related data information exchange (Area 5);
6. Information exchange with emergency management departments and divisions (Area 6);
7. Information exchange concerning environmental monitoring and precaution (Area 7).

An overview of the structural features per network of areas for the collaboration can be found in Table 5.

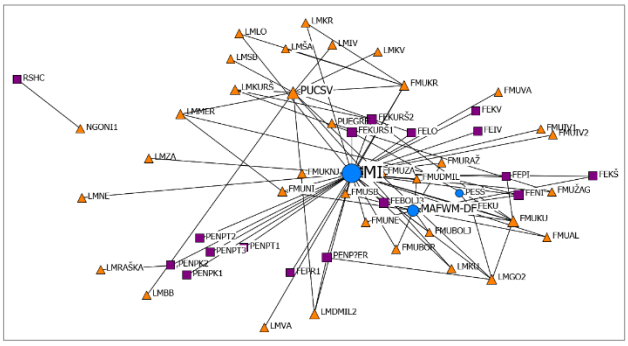
Table 5. Structural characteristics of networks per areas for the collaboration.

Areas for the Collaboration	Degree Range	Eigenvector Centrality Range	Density	Average Distance
Remediation of forest damages from ice breaks, floods, and fires (Area 1)	1–40	0.013–0.638	0.010	2.400
Workshops, seminars and expert knowledge exchange (Area 2)	1–70	0.001–0.472	0.035	2.520
Tree planting, waste disposal and green space maintenance (Area 3)	1–52	0.002–0.677	0.014	2.708
Project-related activities (Area 4)	1–32	0.001–0.647	0.012	3.206
Climate related data and information exchange (Area 5)	1–47	0.003–0.404	0.032	2.524
Information exchange with emergency department and divisions (Area 6)	1–13	0.057–0.700	0.002	2.156
Information exchange concerning environmental monitoring and precaution (Area 7)	1–33	0.123–0.707	0.004	1.941

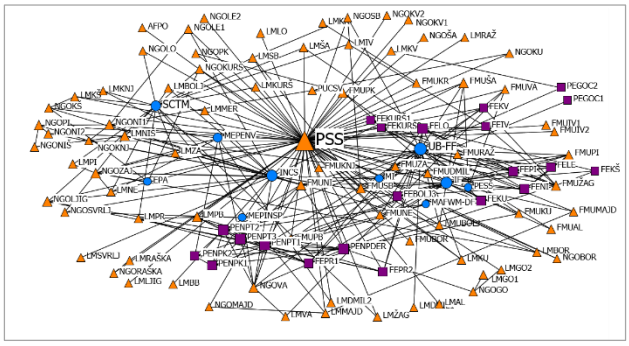
The most striking difference in the results for degree range, eigenvector centrality, and network density is between Area 2 and Area 6. The given results indicate a larger number of stakeholders and actual versus potential ties in knowledge exchange through workshops and seminars as opposed to collaborating through information exchange with emergency departments and divisions, where the number of stakeholders is limited.

Area 5 has similar characteristics to Area 2 (except in degree range). In contrast, the other areas for the collaboration have lower network densities (except for Area 5, with a slightly higher degree range), namely actual versus possible connections. The average distance is most pronounced for Area 4, indicating that stakeholders are far from each other, in contrast to Area 7, where stakeholders are closer to each other. However, when combined with the network density results, Area 2 is expected to have slightly better information sharing efficiency compared to the other areas for the collaboration.

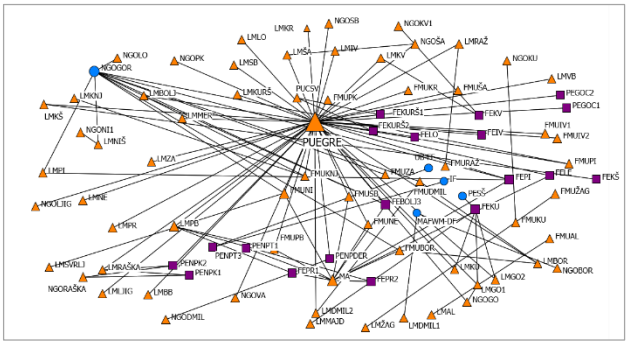
The networks per area for the collaboration in climate change governance in forestry and nature conservation are visually represented in Figure 4a–g.



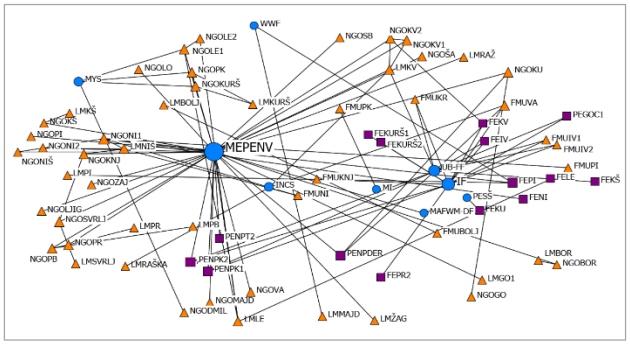
(**a**) Remediation of forest damages from ice breaks, floods, and fires



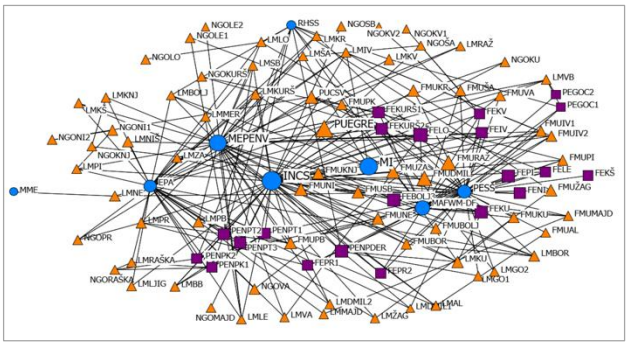
(**b**) Workshops, seminars and expert knowledge exchange



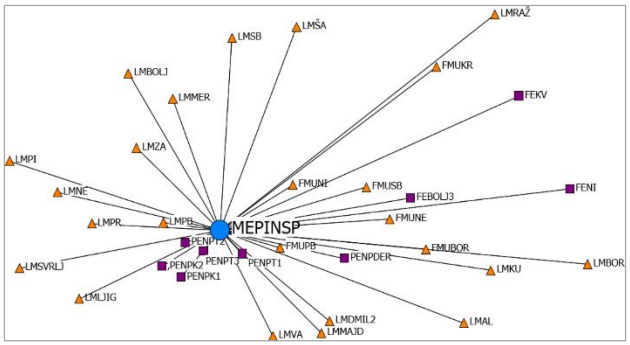
(**c**) Tree planting, waste disposal and green space maintenance



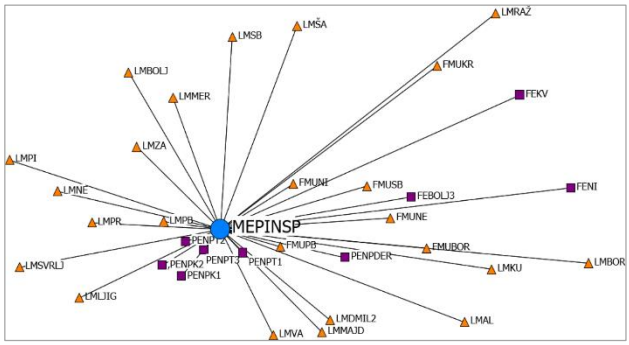
(**d**) Project-related activities



(**e**) Climate related data and information exchange



(**f**) Information exchange with emergency department and divisions



(**g**) Information exchange concerning environmental monitoring and precaution

Figure 4. The networks per area for the collaboration climate change governance in forestry and nature conservation: (**a**) Remediation of forest damages from ice breaks, floods, and fires (Area 1); (**b**) Workshops, seminars and expert knowledge exchange (Area 2); (**c**) Tree planting, waste disposal and green space maintenance (Area 3); (**d**) Project related activities (Area 4); (**e**) Climate-related data and information exchange (Area 5); (**f**) Information exchange with emergency departments and divisions (Area 6); (**g**) Information exchange concerning environmental monitoring and precaution (Area 7).

To find an answer about the connection between stakeholders and the influence of different factors on collaboration tendency, the MRQAP analysis of the whole collaboration network and the analysis of networks per area for the collaboration are applied (Table 6).

The result analysis of the whole collaboration network and the result of the regression coefficient show that stakeholders tend to form collaboration ties when they are in more frequent contact, have a central position in the network and are in the same statistical region. However, the effect of frequency of contact is five times higher than the effect of statistical region, i.e., the effect of a central position in the network. There is also a tendency for collaboration between stakeholders within the same sector (public or civil) but

not the same governance level (national, regional or local). There is no significant effect of the same interest and perceived influence value in climate change governance on the development of collaborative ties between stakeholders.

The MRQAP results per area for the collaboration in terms of frequency of contacts show that when carrying out activities related to tree planting, waste disposal and green space maintenance (Area 3), stakeholders do not need to be in frequent contact. This is not the case for the other areas for the collaboration. Stakeholders have a higher tendency to form collaborative relationships when they are in frequent contact in terms of climate related data and information exchange (Area 5). The same is true for activities such as remediation of forest damages from ice breakage, floods, fire, environmental monitoring and preparedness activities, workshops, seminars and expert knowledge exchange (Areas 1, 7 and 2). According to the respondents, the frequency of contacts does not affect the tendency of collaboration in terms of information exchange with emergency departments and divisions that take place at quarterly, semi-annual and even annual levels.

Stakeholders involved in workshops, seminars and expert knowledge exchange, as well as climate related data and information sharing, tend to establish collaborative relationships even if they do not have the same interest in addressing climate change issues. This is not the case when it comes to remediation activities of forest damage from ice breaks, floods, and fires, as well as information exchange with emergency departments and divisions.

Those stakeholders were involved in tree planting, waste disposal and green space maintenance activities, and project-related activities tend to form collaboration ties with stakeholders who have the same impact on climate change governance.

Table 6. Multiple regression quadratic assignment procedure (MRQAP) via double dekker semi-partialling per area for the collaboration and selected factors.

	Dependent Variables [1]															
	Collaboration Network		**Remediation of Forest Damages**		**Workshops, Seminars and Expert Knowledge Exchange**		**Tree Planting, Waste Disposal and Green Space Maintenance**		**Project-Related Activities**		**Climate Related Data and Information Exchange**		**Information Exchange with Emergency Department and Divisions [5]**		**Information Exchange Concerning Environment. Monitoring and Precaution [6]**	
R^2 per Area for the Collaboration	0.59845		0.11611		0.06570		0.05562		0.01155		0.25759		0.00472		0.05960	
	Coefficient [3]	*p* value [4]	Coefficient	*p* value	Coefficient	*p* value	Coefficient	*p* value	Coefficient	*p* value	Coefficient	*p* value	Coefficient	*p* value	Coefficient	*p* value
	Independent Variables [2]															
Intercept	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Collaboration frequency	0.67584	**0.00010**	0.31404	**0.00010**	0.12944	**0.00010**	−0.04337	**0.00130**	0.06579	**0.00070**	0.47843	**0.00010**	0.01654	0.11409	0.23097	**0.00010**
Interest value	−0.00512	0.34807	0.04848	**0.00520**	−0.05738	**0.01090**	0.03126	0.08599	0.01147	0.30587	−0.08839	**0.00010**	0.03691	**0.00770**	−0.04342	0.07069
Perceived influence value	0.01082	0.16428	0.00449	0.43246	0.01220	0.27437	0.03729	**0.01120**	0.02612	**0.05009**	0.01168	0.23888	0.00182	0.46575	−0.03497	0.10909
Sector affiliation	0.02619	**0.01870**	0.02564	0.09789	−0.00231	0.44916	0.02005	0.19118	−0.03014	**0.06189**	0.05911	**0.00010**	0.03606	**0.00860**	0.03209	0.10029
Statistical region affiliation	0.13481	**0.00010**	−0.02005	0.13289	0.10218	**0.00590**	0.23602	**0.00010**	0.02967	**0.07339**	−0.05709	**0.00060**	0.02115	0.07259	−0.04867	**0.00060**
National level affiliation	−0.03471	**0.00020**	−0.00957	0.28857	−0.01709	0.16578	−0.05233	**0.00010**	0.03226	**0.03610**	−0.01079	0.23738	−0.01563	0.05559	−0.00553	0.46245
Regional level affiliation	−0.00019	0.51665	−0.0348	**0.00470**	0.07204	**0.00090**	−0.02610	**0.02730**	−0.02253	**0.02660**	−0.03950	**0.00160**	−0.01590	**0.04260**	−0.01473	0.17848
Local level affiliation	−0.05907	**0.00170**	−0.04610	0.08939	−0.02541	0.22358	−0.04411	0.13069	−0.04764	**0.04350**	−0.05953	**0.01790**	−0.04071	**0.02900**	−0.02217	0.30367
Centrality of position	0.15087	**0.00010**	0.02803	0.16028	0.11990	**0.00010**	0.02565	0.21358	0.00965	0.32487	0.00173	0.45805	−0.01706	0.18818	−0.01555	0.40706

[1] Dependent variables are collaboration network and all areas for the collaboration (Areas 1–7). [2] Independent variables are frequency of contacts, same interest value, same perceived influence value, same sector affiliation, same statistical region affiliation, same governance level (national, regional, local), and eigenvector results. [3] Standardized coefficient. [4] Significance: $p < 0.05$ (numbers in bold indicate statistically significant results). [5,6] Results of collaboration Area 6 and Area 7 (almost maximal centralization, very low network density), are supplemented with explanations based on qualitative interpretation of result.

Stakeholders involved in climate-related data- and information-sharing activities and information exchange with emergency departments and divisions tend to form collaboration ties with other stakeholders belonging to the same sector (public and/or civil). In this case, the results can be explained by civil society organizations' marginal participation when it comes to both mentioned areas for the collaboration.

The collaboration tendency between stakeholders from the same statistical region is most prominent in tree planting, waste disposal and green space maintenance activities, with two-times lower negative effects on workshops, seminars and expert knowledge exchange. Such results are not surprising for tree planting, waste disposal and green space maintenance activities, which are mainly based on individual initiatives and personal contacts with other stakeholders from the same municipality or city. This is not the case for workshops, seminars and expert knowledge exchange.

Stakeholders tend to collaborate when they are at the same national governance level, only in project related activities. The tendency for stakeholders to collaborate at the same regional governance level is visible in workshops, seminars and expert knowledge exchange. Complementing the results for this particular area for the collaboration with the results of the core-periphery analysis, 52% of the total 19 "central" stakeholders that are maximally interconnected are at the regional governance level (Table A5). The participation of PE NPs and various SEs in various nature awareness workshops and meetings and technical activities, as well as knowledge sharing, including with stakeholders from another statistical region, confirm these findings.

Belonging to a local governance level has a negative but significant effect on project-related activities, climate related data and information sharing, and information exchange with emergency departments and divisions. This result also suggests that other stakeholders at the national (project related activities) and regional levels of governance (and expert knowledge exchange and the work of emergency headquarters) are also present.

Stakeholders involved in workshops, seminars and expert knowledge exchange tend to form collaboration ties with stakeholders who have a central position in the network.

In each of the above areas for the collaboration, it is noticeable that different organizations occupy a central position in the network. The prominent role of MI-SEM, namely city departments and municipal divisions, in the organization and implementation of protection and rescue measures is visible in collaboration Area 1 and Area 6. On the other hand, the Ministry of Environmental Protection (MEP), through the Sector of environmental governance, has a prominent role in project related activities (Area 4), while the environmental monitoring and precaution sector occupies the same position in Area 7. Collaboration through workshops, seminars and expert knowledge exchange is concentrated in primary and secondary schools (PSS), as can be seen in Area 2 of collaboration. In contrast, collaboration related to tree planting, waste disposal, and green space maintenance reveals the prominent role of Public Utility Enterprise for Greenery (PUE for Greenery). Several organizations stand out in terms of climate-related data and information-sharing activities. While MAFWM-DF collaboration is focused on climate-related data and information sharing with PE "Srbijašume"—FEs and FMUs, MEP cooperates with LS and some NGOs.

The Institute for Nature Conservation Serbia (INCS) cooperates with FEs and FMUs as well as LS and NGOs and exchanges information on protected areas and the state of biodiversity. The Environmental Protection Agency cooperates mainly with LS by exchanging air quality data.

However, the results from Table 5, Area 6 show that none of the analyzed factors significantly affect the tendency to form collaboration ties. One of the reasons for the high centralization of this area for the collaboration is that the responsibility for emergency management lies with MI-SEM, i.e., city departments and municipal divisions for emergency management at the local level. Members of the mentioned departments and divisions are only PEs and LS representatives, without representatives of civil and private

sectors. In the case of smaller municipalities, collaboration takes place on the basis of direct individual contacts between members. In addition, the work of MI-SEM, even at the local level, is not fully recognized as a climate-change related collaboration by many respondents from PEs.

For Area 7, only the frequency of contacts has a positive effect on the tendency to form collaborative ties, with an effect five times higher than the negative effect of belonging to the same statistical region. This suggests that organizations tend to collaborate when they are in frequent contact but do not belong to the same region. The results are not surprising given that MEP-Sector for Environmental Monitoring and Precaution organizes monthly or quarterly meetings with representatives of PE and LS, which do not cooperate with each other on this particular issue.

Activities related to collaboration in climate-related data and information sharing (Area 5) stand out in terms of the number of factors that significantly influence the formation of collaboration ties. In this case, affiliation to the national governance level, central position in the collaboration network and equal perceived influence value in climate change governance do not significantly influence the tendency to collaborate, while other elements mostly have a negative (equal interest value in climate change governance, affiliation to the statistical region, affiliation to the regional and local governance level) or positive (same sector affiliation) effect. These results suggest that stakeholders tend to form collaboration ties in sharing data and information when they are from the same sector and in frequent contact. Nevertheless, they do not share the same interest in climate change governance, are not located in the same statistical region and do not operate at the same local governance level. It is important to emphasize that the effect of frequent contact is eight times larger than the effect of being from the same sector.

5. Discussion

Stakeholders in the "key players" quadrant represent important stakeholders who have high interest and enough influence to support (or not) certain strategies. In contrast, those in the "subject" quadrant have high interest but less (perceived) influence than "key players". While stakeholders in the "crowd" quadrant could be potential stakeholders due to their low interest and (perceived) influence, stakeholders in the "context creators" quadrant have enough (perceived) influence in climate change governance to influence strategies but not enough to influence interest in participation [90]. This research shows that only stakeholders from the public sector are in the "key players" quadrant, predominantly organizations at the national governance level. On the other hand, stakeholders in the "subject" quadrant are mainly from the private and civil sectors with affiliation to the local governance level.

Although many stakeholders are involved in the governance of climate change in forestry and nature conservation in Serbia [45], research findings suggest that they are not fully interconnected (lower network density, high centralization index, core-periphery analysis results).

These results indicate a high dependency of peripheral stakeholders in relation to the main (central) stakeholders. Previous research has shown that if the peripheral stakeholders are excluded from the network, there is a possibility that the network will break down into several smaller components [92], which makes them not resistant to change [93]. Furthermore, the uneven distribution of ties and differences in influence levels for climate change governance among stakeholders challenge the legitimacy and commitment of other peripheral stakeholders [94], who have a "follower" role and fewer opportunities to initiate and develop different activities [95]. Nevertheless, centralized networks with a limited number of central stakeholders can also have a positive impact when it comes to the efficiency of information sharing [84,95]. However, when it comes to solving complex problems, decentralized networks may have a better impact [84,95].

There is a visible tendency towards collaboration between stakeholders from the public sector. However, disconnection with stakeholders from other sectors and from organizations with different competencies can affect the reduction of communication [96] and affect the establishment of trust and mutual support [53]. Although public sector organizations play an important role in coordinating and implementing various policies in natural resource management [63,97], it is necessary to incorporate and harmonize the contributions of various stakeholders, including the private and civil sectors, in climate change governance [15]. Moreover, if the tendency of collaboration among stakeholders at one level of governance persists, it may be an obstacle to the transition to decentralized governance for natural resources and climate change [19].

The results of the core-periphery node analysis per area for the collaboration show that civil society organizations are in peripheral positions, with the exception of knowledge exchange through workshops and seminars. This area for the collaboration has the greatest diversity of stakeholders from different governance levels, in favor of organizations at the regional and local governance levels. What makes this area for the collaboration unique are two central stakeholders from the civil sector, i.e., NGOs. The SCTM has the role of a facilitator in information and knowledge sharing through a partially established system of collaboration between the MEP at the national level and local self-government [45]. The respondents confirmed the frequent collaboration of stakeholders at regional (PE NP) and national (INCS) levels with local NGOs through various workshops organized by NGOs. In the case of collaboration between organizations at the regional and local levels, the geographical proximity (belonging to the same statistical region and to the same municipality) helps to establish frequent contacts and collaboration between organizations [98]. The high interest of civil-sector stakeholders in climate change governance (based on the results of the interest and perceived influence matrix) indicates their understanding of knowledge enhancement through collaboration with organizations at other (regional and national) levels of governance to address climate change [19].

Considering that climate governance in Serbia has a traditional top-down governance approach [46,68], the involvement of stakeholders at all levels in climate change governance in forestry and nature conservation would be necessary.

The different structures of collaboration networks show that each network has individual characteristics that affect their dynamics differently and can be considered essential for successful natural resource governance [84]. The research results per area for the collaboration show that the factors analyzed do not affect the tendency of stakeholders to form collaboration ties in the same way. Factors that positively influence the collaboration tendency for one activity neither affect the tendency to form collaboration ties for another activity nor have a negative effect.

Research [99] regarding the influence of structural characteristics of social networks on natural resource governance shows that significant differences in the process and outcomes of natural resource governance are expected when there are differences in network density, centrality, cohesion, and connectivity. Creating bonds between stakeholders with the same views or goals (bonding ties) has a positive effect on building mutual trust between stakeholders [100,101] and supports the process of agreement creation and conflict resolution [101]. However, the presence of bonding ties can also have a negative effect by limiting the possibility of sharing information and experiences with stakeholders outside their network [102,103]. On the other hand, bonding with other stakeholders or groups outside their network, creating so-called bridging ties, is a characteristic of networks with somewhat weaker ties [104]. This can have a positive impact on the exchange of knowledge and information between different stakeholders from different levels of governance [99,105], contribute to the formation of social capital, and represent a positive "step forward" in stakeholder relations [106,107].

It is mentioned that "favoring one characteristic likely occurs at the expense of another" [99] (p. 366), so there is a need to balance different and often opposing structural

features of networks, which has implications for natural resource governance, among other things [53,99].

It seems challenging to determine the nature and exact number of linkages and the relationship between central and peripheral stakeholders in the collaboration network [101]. However, strengthening the role of the civil sector, i.e., NGOs, through their networking and coordination activities with other public sector stakeholders can support the process of harmonizing their interests and collaborating at different levels of governance [108].

Trust is an essential component of social capital that lubricates collaboration [109]. Frequent interaction in collaboration represents an important element of trust building, [26,110,111]. This is also confirmed in other research related to the governance of natural resources [112–115]. Spending more time together and having more frequent meetings has a positive effect on building trust between the local community and forest service management authority [115] and between different stakeholders in relation to fisheries management [114].

Research has shown that stakeholders operating at lower levels of governance play an important role in facilitating communication and information sharing between central and lower levels of governance [19]. Building collaborative partnerships with NGOs [116] and engaging in dialog [117,118] can have a positive impact on addressing climate change challenges. Environmental NGOs are already involved in European forestry policy decision-making processes through multi-stakeholder dialogs [35,36]. At the national and local level, their engagement in forestry can range from providing policy advice, to collaborating on policy advocacy, to assisting in the implementation of forest policy initiatives [119]. Perhaps the most notable change in the role and involvement of NGOs has taken place in the field of nature conservation, i.e., in the implementation of Natura 2000.

Indeed, in Poland and Hungary, the Natura 2000 process led to development of interactions between state stakeholders and NGOs and "strengthened the position of the third sector in environmental policymaking" (p. 125), creating new opportunities for NGO involvement and establishing coalitions with state stakeholders [120] (p. 125). Nevertheless, a greater involvement of NGOs in the different stages of Natura 2000 formulation and implementation, as well as a shift from a more peripheral to a central role, is desirable [56,121].

Establishing intermediaries that connect stakeholders from different governance levels and represent a central organization in knowledge and information transfer within and outside the network [99] could positively influence climate change governance in forestry and nature conservation in Serbia.

6. Conclusions

In this paper, by combining SA and SNA, a clearer picture of stakeholders, areas for the collaboration, connectivity and stakeholder interactions in climate change governance in forestry and nature conservation is obtained.

The application of SA provided information on the (perceived) influence and interest of the specified stakeholders in relation to climate-change governance decision making, as well as a distribution pattern in the interest and perceived influence matrix. Although the identified stakeholders of forestry and nature conservation in climate change governance are from the public, civil and private sectors and are active at all levels of governance, most stakeholders from the civil and private sectors are distributed in the subject quadrant and also occupy the peripheral position within the collaboration network.

Each of the analyzed factors has a positive influence on the collaboration tendency to collaborate for at least one area for the collaboration (central position in the network, belonging to the same national and regional governance level), i.e., for two areas for the collaboration (same interest, same perceived influence, same sector affiliation and same statistical region) and for five areas for the collaboration (frequency of contacts). However, when it comes to same governance level affiliation, none of the areas for the collaboration

confirms the tendency of stakeholders to collaborate when they belong to the local governance level. Although all areas for the collaboration have different structural characteristics (network position, number and range of ties), stakeholders from all governance levels are represented. The only exception is collaboration Area 3, namely tree planting, waste disposal and green space maintenance, without stakeholders from the regional governance level.

On the other hand, collaboration on consultation and the work of emergency headquarters, as well as collaboration on precautionary and environmental monitoring, takes place only between public sector stakeholders, with a more central position of local stakeholders (when it comes to consultation activities and the work of emergency headquarters), who participate directly in all activities related to emergency situations at city or municipal level.

Based on the results obtained through the analysis of different factors that can influence the formation of collaborative relationships, the frequency of contacts can be highlighted as one of the significant factors of collaboration in climate change governance if we consider the whole collaborative network, which is not the case if we consider the areas for the collaboration. In addition, it is necessary to consider other factors when it comes to consultations with emergency management departments and division activities because none of the analyzed factors significantly affected collaboration.

This research also confirms that climate change governance collaboration in forestry and nature conservation has a very centralized top-down approach, with limited representation and a mostly peripheral position of civil society organizations in the collaboration network. Moreover, segregated stakeholders in the network were also identified, confirming the emergence of individual climate change governance collaboration initiatives between different organizations.

Nevertheless, a more prominent representation of civil society organizations and the central position of two NGOs in the activities related to education (workshops, seminars) and expert consultations is visible. This indicates the possibility of change because all stakeholders have a high interest in climate change governance.

While the distribution of stakeholders in the perceived influence and interest matrix provided insight into the perceived influence of stakeholders on decision making in climate change governance, SNA analysis clarified stakeholders' connections, their position within the collaborative network and various factors influencing the formation of collaborative relationships per analyzed area at the network level. Overall, the combination of SA and SNA analysis proved useful in the analysis of climate change governance in forestry and nature conservation in selected forest regions in Serbia, where there is still a lack of clarity about who the stakeholders are, areas for collaboration and the position of stakeholders within the collaborative network, as well as factors influencing the formation of collaborative relationships. A similar type of research combining SA and SNA analysis may also be valuable to the broader research community in countries dealing with similar challenges.

However, there are limiting aspects of this research, which should be taken into consideration. For this research, 11 FRs were considered (out of 27 in Serbia), namely two statistical regions. Therefore, the organizations at the national level of governance in forestry and nature conservation were not considered.

Broadening the study area, consistently expanding the organizations and selecting respondents from all sectors, including the private sector, can contribute to a better understanding of climate change governance collaboration in forestry and nature conservation in Serbia. SA did not cover the different interest and influence dimensions of stakeholders; therefore, collecting more information from different aspects of climate change governance to answer the subjective questions related to interest and influence could contribute to a better understanding of stakeholders.

Considering the effective implementation of climate change policy commitments in forestry and nature conservation in Serbia, there is a need for greater involvement of various organizations with competencies in climate change governance, especially from the civil and public sectors at the local governance level. Empowering local level organizations in climate change, and establishing intermediaries in knowledge and information transfer between public and civil sectors at different governance levels, could be one of the future steps needed to achieve multilevel climate change governance in forestry and nature conservation.

Author Contributions: The results and article are part of the emerging PhD thesis at the Faculty of Forestry, the University of Belgrade of M.S. and her supervisor D.N. with the title: "Organization of the support system and collaboration in multilevel climate change governance in forestry and related sectors". Conceptualization, M.S., J.N., D.N. and M.L.; methodology, M.S., J.N., D.N. and M.L.; software, M.S. and M.L.; validation, M.S., and M.L.; formal analysis, M.S.; resources, M.S. and J.N.; writing—original draft preparation, M.S., J.N. and M.L.; writing—review and editing, J.N., M.L., D.N. and Š.P.M.; visualization, M.S.; supervision, Š.P.M., M.L. and D.N. All authors have read and agreed to the published version of the manuscript.

Funding: The research was funded by the ministry of education, science and technological development of the Republic of Serbia, based on the agreement on the financing of scientific research work of SRO in 2021, registration number 451-03-9/2021-14/200169 from 5th February 2021. Maastricht School of Management financed related APC costs.

Acknowledgments: The authors wish to thank all the interviewees who took part in this research and made it possible by sharing their attitudes. We also want to thank the anonymous reviewers for their comments and contributions and special issue guest editor Zuzana Dobšinská.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Appendix A

Table A1. Specified public sector organizations in forestry and nature conservation with climate change competency overview.

Abbrev.	Specified Stakeholders	Climate Change Competency
PUBLIC SECTOR		
Public Administration and Local Self-Government		
MEP	Ministry of Environmental Protection Sector for environmental governance Sector for environmental monitoring and precaution Sector for nature conservation and climate change	Harmonization and/or development of strategies, policies, and laws for environmental protection, nature, climate change, and other related activities
MAFWM-DF	Ministry of Agriculture, Forestry and Water Management—Directorate of Forests	Harmonization and/or development of forestry strategies, policies, and laws with the strategy of adaptation to climate change
MME	Ministry of Mining and Energy Sector for energy efficiency and renewable resources	Adaptation and/or development of strategies, policies, and laws of energy, climate change, and the use of renewable energy resources (RES)
MI	Ministry of Interior Sector for emergency management	Organizing and implementing measures for the protection and rescue of people, material and cultural goods, and the environment from natural disasters
CG	City administration government Departments, divisions, and services for environmental protection Departments, divisions, and services for environmental control and inspection	Development and preparation of local action plans for environmental protection, nature conservation activities, environmental inspection

MG	Municipal administration government Departments and divisions for environmental protection Departments, division, and services for environmental control and inspection Departments and division for economic development	Preparation and implementation of local action plans for environmental protection, provision of control and inspection of environmental protection
DDEM	City departments and municipal divisions for emergency management	Management and coordination of measures for protection and rescue of people, material and cultural goods and the environment from natural disasters,
VC	Village communities	Implementation of actions and programs for environmental protection
	Public institutions and services	
	Agencies and Institutes	
INCS	Institute for Nature Conservation of Serbia	Monitoring the state of biodiversity, providing guidelines for sustainable management of protected areas, application of international conventions, research work
CIPH	City Institutes for Public Health	Preparation, planning and implementation of programs for monitoring the state and preservation of the environment; identification and implementation of measures in natural and other major disasters and emergencies;
	Education and research organizations (faculties, schools and institutes)	
UB-FF	University of Belgrade—Forestry Faculty	Research work, education and education in forestry-related to climate change
IF	Institute of Forestry, Belgrade	Research work in forestry, nature conservation, environment, etc. concerning climate change
UB-FB	University of Belgrade—Faculty of Biology	Research, education and education in the environment and nature conservation about climate change
PSS	Primary and Secondary Schools	Education and education on environmental protection, nature conservation in connection with climate change
	Public Enterprises (PE)	
	PE for state forest management	
PESŠ	PE "Srbijašume"—forest estates and forest management units	Sustainable forest management, research on forest management and the impact of climate change
	PE National Parks (NP)	
PE NP	PE "NP Tara", Bajina Bašta; PE "NP Kopaonik", Kopaonik; JPE "NP Đerdap", Donji Milanovac.	Protected area governance, the impact of climate change on protected areas
	Other PE	
PEES	PE "Elektroprivreda Srbije" branch HE "Đerdap", Kladovo; branch Drinsko-Limske HE, Bajina Bašta	Transmission and distribution of electricity, acceptance of the flood wave, measures to improve the efficient use of water resources
PWESV	PWE "Srbijavode", Belgrade	Regulation of watercourses and protection against the harmful effects of water, implementation of flood defenses, execution of measures and works for protection against torrents
PUEGRE	PUE for Greenery	Landscaping and maintenance of green public areas, landscaping and maintenance of the environment, waste management
PUEH	PUE for Heating	Transmission and distribution of electricity and heat, gas, measures to improve the efficient use of energy resources, including RES

Table A2. Specified civil and private sector organizations in forestry and nature conservation with climate change competency overview.

Abbrev.	Specified Stakeholders	Climate Change Competencies
CIVIL AND PRIVATE SECTOR		
Nongovernmental Organizations and Citizens Associations		
Nongovernmental Organizations (NGO)		
		Environmental NGO
NGOGOR	NGO "Pokret Gorana Srbije"	Afforestation, landscaping activities, educational work with youth on improving the environment and raising environmental awareness, including the issue of climate change
NGO	Local environmental NGO	Raising public awareness on nature conservation, environmental protection about climate change
NGOKNJ	Timočki klub, Knjaževac	Raising public awareness on nature conservation, environmental protection concerning climate change
		Humanitarian NGO
		Citizens Associations
		Business and Professional Associations
HA	Hunting Associations	Protection and hunting of wild animals, gathering, organizing and implementing activities of all citizens interested in the conservation of nature, flora and fauna, as well as ecological protection of the natural environment
MA	Mountaineering Associations	Sport manifestations, information exchange and awareness raise on environmental protection and climate change
PRIVATE SECTOR		
APFO	Associations of Private Forest Owners	Encouraging the exchange of information and implementation of projects related to sustainable forest management,
PFO	Private Forest Owners	Use of forests

Table A3. Overview of public sector stakeholders in collaboration network per sector affiliation.

Abbrev.	Name of Institution/Organization	Abbrev.	Name of Institution/Organization
PUBLIC SECTOR			
Public Administration and Local Self-Government			
MEPENV	Ministry of Environmental Protection—Sector for environmental governance	MAFWM-DF	Ministry of Agriculture, Forestry and Water Management—Directorate of Forests
MEPINSP	Ministry of Environmental Protection—Sector for environmental monitoring and precaution	MME	Ministry of Mining and Energy
MI	Ministry of Interior—Sector for Emergency Management	MYS	Ministry of Youth and Sport
LMKV	City administration Kraljevo	LMKU	Municipal administration Kučevo
LMLE	City administration Leskovac	LMGO1	Municipal administration Golubac
LMNIŠ	City administration Niš	LMGO2	Municipal administration Golubac
LMPI	City administration Pirot	LMŠA	Municipal administration Šabac
LMKŠ	City administration Kruševac	LMVA	Municipal administration Valjevo
LMSB	Municipal administration Sokobanja	LMLJIG	Municipal administration Ljig
LMZA	Municipal administration Zaječar	LMMAJD	Municipal administration Majdanpek
LMNE	Municipal administration Negotin	LMBOR	Municipal administration Bor
LMDMIL1	Municipal administration Majdanpek	LMAL	Municipal administration Aleksinac
LMDMIL2	Municipal administration Majdanpek	LMKNJ	Municipal administration Knjaževac
LMRAŠKA	Municipal administration Raška	LMSVRLJ	Municipal administration Svrljig
LMPB	Municipal administration Priboj	LMMEROŠ	Municipal administration Merošina
LMBB	Municipal administration Bajina Bašta	LMKURŠ	Municipal administration Kuršumlija
LMLO	Municipal administration Loznica	LMRAŽ	Municipal administration Ražanj
LMKR	Municipal administration Krupanj	LSBOLJ	Municipal administration Boljevac
LMIV	Municipal administration Ivanjica	LMPR	Municipal administration Prijepolje
LMVB	Municipal administration Vrnjačka Banja	LMŽAG	Municipal administration Žagubica

DDEM	City dep. and municipal for emergency management divisions		
	Public institutions and services		
	Agencies and Institutes		
INCS	Institute for Nature Conservation of Serbia	EPA	Environmental Protection Agency
	Education and research organizations (faculties, schools and institutes)		
UB-FF	University of Belgrade—Forestry Faculty	IF	Institute of Forestry, Belgrade
PSS	Primary and Secondary Schools		
	Other institutions and services		
TO	Touristic organizations of local government units		
	Public Enterprises (PE)		
	PE for state forest management		
PESŠ	PE "Srbijašume"		
	PE "Srbijašume"—Forest Estates (FE)		
FEKŠ	PE "Srbijašume"—FE Rasina	FEKURŠ1	PE "Srbijašume"—FE "Toplica"
FEKURŠ2	PE "Srbijašume"—FE "Toplica"	FEIV1	PE "Srbijašume"—FE "Golija"
FENI	PE "Srbijašume"—FE "Niš"	FELE	PE "Srbijašume"—FE "Šuma"
FEBOLJ	PE "Srbijašume"—FE "Timočke šume"	FEKU	PE "Srbijašume"—FE "Severni Kučaj"
FEPR	PE "Srbijašume"—FE "Prijepolje"	FEPI	PE "Srbijašume"—FE "Pirot"
FELO	PE "Srbijašume"—FE "Boranja"	FEKV	PE "Srbijašume"—FE "Stolovi"
	PE "Srbijašume"—Forest Management Units (FMU)		
FMURAŽ	PE "Srbijašume"—FE "Rasina"—FMU Ražanj	FMUKR	PE "Srbijašume"—FE "Boranja"—FMU "Krupanj"
FMUBOLJ	PE "Srbijašume"—FE "Timočke šume"—FMU Boljevac	FMUIV2	PE "Srbijašume"—FE "Golija"—FMU "Ivanjica"
FMUSB	PE "Srbijašume"—FE "Niš"—FMU Sokobanja	FMUIV3	PE "Srbijašume"—FE "Golija"—FMU "Devići"
FMUAL	PE "Srbijašume"—FE "Niš"—FMU Aleksinac	FMUPK	PE "Srbijašume"—FE "Toplica"—FMU "Prokuplje"
FMUKNJ	PE "Srbijašume"—FE "Timočke šume"—FMU "Knjaževac"	FMUKU	PE "Srbijašume"—FE "Severni Kučaj"—FMU "Kučevo"
FMUNI	PE "Srbijašume"—FE "Niš"—FMU "Niš-Bačka Palanka"	FMUŠA	PE "Srbijašume"—FE "Boranja"—FMU "Šabac"
FMUZA	PE "Srbijašume"—FE "Timočke šume"—FMU "Zaječar"	FMUVA	PE "Srbijašume"—FE "Boranja"—FMU "Valjevo"
FMUBOR	PE "Srbijašume"—FE "Timočke šume"—FMU "Bor"	FMUPI	PE "Srbijašume"—FE "Pirot"—FMU "Pirot"
FMUDMIL	PE "Srbijašume"—FE "Timočke šume"—ŠU "Donji Milanovac"	FMUMAJD	PE "Srbijašume"—FE "Severni Kučaj"—FMU "Majdanpek"
FMUPB	PE "Srbijašume"—FE "Prijepolje"—ŠU "Priboj"	FMUŽAG	PE "Srbijašume"—FE "Severni Kučaj"—FMU "Žagubica"
	PE for management of protective forests		
PEGOČ1	PE for management of protective forests of Vrnjačka Banja "Šume—Goč"	PEGOČ2	PE for management of protective forests of Vrnjačka Banja "Šume—Goč"
	PE National Parks (NP)		
PENPT1,	PE "NP Tara", Bajina Bašta	PENPĐER	PE "NP Đerdap", Donji Milanovac.
PENPT2	PE "NP Tara", Bajina Bašta	PENPT13	PE "NP Tara", Bajina Bašta
PENPK1	PE "NP Kopaonik", Kopaonik	PENPK2	PE "NP Kopaonik", Kopaonik
	Other PE		
PEES	PE "Elektroprivreda Srbije" branch HE "Đerdap", Kladovo; branch Drinsko-Limske HE, Bajina Bašta	PUEGRE	PUE for Greenery
PERS	PE "Putevi Srbije", Belgrade	PUEH	PUE for Heating
PWESV	PWE "Srbijavode", Belgrade		

Table A4. Overview of civil sector stakeholders in collaboration network per sector affiliation.

Abbrev.	Name of Institution/Organization	Abbrev.	Name of Institution/Organization
CIVIL AND PRIVATE SECTOR			
Nongovernmental Organizations and Citizens Associations			
Nongovernmental Organizations (NGO)			
International NGO			
WWF	World Wide Fund for Nature Adria-Serbia, Belgrade	REC	Office of Regional environmental center for Central and Eastern Europe, Belgrade
Environmental NGO			
NGO GOR	NGO "Pokret Gorana Srbije"	NGONIŠ2	NGO "Razvojni centar"
NGONI1	NGO "Zeleni ključ", Niš	NGOSVRLJ	Woman association "ETNO forum"
NGOKNJ	NGO "Timočki klub", Knjaževac	NGOKURŠ	NGO "Sektor za razvoj i saradnju regiona"
NGONI2	NGO "Protekta", Niš	NGOPK	NGO "Pozitivni društveni faktor"
NGORAŠ	NGO "Zeleni putokaz", Raška	NGOPI	NGO "GEA"
NGOKV1	NGO "Bennem", Kraljevo	NGOKŠ	NGO "Treehouse"
NGOKV2	NGO "Klasična tradicija", Kraljevo	NGOPB	NGO "Argument"
NGOLE1	Youth association "Logos"	NGOPR	NGO "Ožalj"
NGOLE2	Development center "Mreža"	NGOMAJD	NGO "Majdan-eko"
NGOKU	NGO "Entuzijasti Kučeva"	NGOLJIG	NGO "Seoski turizam Srbije"
NGOGO	Association "Ekopek"	NGOBOR	NGO "Eko-klub"
NGOŠA	NGO "Ekos"	NGOZAJ	Timočki youth center
NGOVA	Ecological association Gradac	NGODMIL	NGO "Lazarus"
NGOLO	NGO "Razvoj sela"	NGOSB	NGO "Sokobanjsko ekološko društvo"
Humanitarian NGO			
RSHC	Russian Serbian Humanitarian Center		
Organizations for Advocacy and Public Policy			
SCTM	Standing Conference of Towns and Municipalities		
Citizens Associations			
Business and Professional Associations			
HA	Hunting Associations	FA	Fishing Associations
Associations of Private Forest Owners			
PRIVATE SECTOR			
APFO	Associations of Private Forest Owners		

Table A5. Overview of the organizations affiliation to the central node for the entire network and per collaboration area.

Collaboration Area	Entire Network	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7
Governance Level	**Central Node Affiliation (%)**							
National	30	20	18	/	24	28	25	50
Regional	27.5	30	52	20	11	33	/	/
Local	42.5	50	30	80	65	39	75	50

References

1. IPCC. Summary for policymakers. In *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems*; Shukla, P.R., Skea, J., Buendia, E.C., Masson-Delmotte, V., Pörtner, H.-O., Roberts, D.C., Zhai, P., Slade, R., Connors, S., Diemen, R., et al., Eds.; Cambridge University Press: Cambridge, UK, 2019.
2. Rajapaksa, D.; Islam, M.; Managi, S. Natural capital depletion: The impact of natural disasters on inclusive growth. *Econ. Disasters Clim. Chang.* **2017**, *1*, 233–244, doi:10.1007/s41885-017-0009-y.
3. Managi, S.; Guan, D. Multiple disasters management: Lessons from the Fukushima triple events. *Econ. Anal. Policy* **2017**, *53*, 114–122, doi:10.1016/j.eap.2016.12.002.
4. González-De Vega, S.; De las Heras, J.; Moya, D. Resilience of mediterranean terrestrial ecosystems and fire severity in Semiarid areas: Responses of Aleppo Pine forests in the short, mid and long term. *Sci. Total Environ.* **2016**, *573*, 1171–1177, doi:10.1016/j.scitotenv.2016.03.115.

5. European Commission. Joint Research Centre. *Forest Fire Danger Extremes in Europe under Climate Change: Variability and Uncertainty*; Publications Office: Luxembourg, 2017.
6. García-Llamas, P.; Suárez-Seoane, S.; Taboada, A.; Fernández-Manso, A.; Quintano, C.; Fernández-García, V.; Fernández-Guisuraga, J.M.; Marcos, E.; Calvo, L. Environmental drivers of fire severity in extreme fire events that affect Mediterranean Pine forest ecosystems. *For. Ecol. Manag.* **2019**, *433*, 24–32, doi:10.1016/j.foreco.2018.10.051.
7. Koutsias, N.; Arianoutsou, M.; Kallimanis, A.S.; Mallinis, G.; Halley, J.M.; Dimopoulos, P. Where did the fires burn in Peloponnisos, Greece the summer of 2007? Evidence for a synergy of fuel and weather. *Agric. For. Meteorol.* **2012**, *156*, 41–53, doi:10.1016/j.agrformet.2011.12.006.
8. San-Miguel-Ayanz, J.; Moreno, J.M.; Camia, A. Analysis of large fires in European Mediterranean landscapes: Lessons learned and perspectives. *For. Ecol. Manag.* **2013**, *294*, 11–22, doi:10.1016/j.foreco.2012.10.050.
9. Turco, M.; von Hardenberg, J.; AghaKouchak, A.; Llasat, M.C.; Provenzale, A.; Trigo, R.M. On the key role of droughts in the dynamics of summer fires in Mediterranean Europe. *Sci. Rep.* **2017**, *7*, 81, doi:10.1038/s41598-017-00116-9.
10. Aleksić, P.; Krstić, M.; Jančić, G. Forest fires—Ecological and economic problem in Serbia. *Bot. Serbica* **1999**, *33*, 169–176.
11. Rankovic, N.; Poduska, Z.; Nedeljkovic, J.; Nonic, D. Influence of temperature and rainfalls on the number of visitors in the National Park "Tara". *Glas. Sumar. Fak.* **2015**, *112*, 97–120, doi:10.2298/GSF1512097R.
12. Rankovic, N.; Nedeljkovic, J.; Zlatic, M.; Stanisic, M.; Nonic, D. Trends in the extent of damages from natural hazards in forests in Serbia and the influence of temperature and precipitation. *Glas. Sumar. Fak.* **2016**, *114*, 201–218, doi:10.2298/GSF1614201R.
13. Rankovic, N.; Stanisic, M.; Nedeljkovic, J.; Nonic, D. Damage trends in selected forest regions and a future period forecast. *Glas. Sumar. Fak.* **2019**, *119*, 189–212, doi:10.2298/GSF1919189R.
14. Hallegatte, S.; Maskrey, A.; Oki, T.; Oswald-Spring, U.; Wilbanks, T.; Zebhe Yanda, P. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change*; Field, C.B., Barros, V., Stocker, T.F., Dahe, Q., Eds.; Cambridge University Press: Cambridge, UK, 2012, doi:10.1017/CBO9781139177245.
15. Fröhlich, J.; Knieling, J. Conceptualising climate change governance. In *Climate Change Governance*; Knieling, J., Leal Filho, W., Eds.; Springer: Berlin/Heidelberg, Germany, 2013; pp. 9–26. ISBN: 978-3-642-29831-8.
16. Blomquist, W. Multi-level governance and natural resource management: The challenges of complexity, diversity, and uncertainty. In *Institutions and Sustainability*; Beckmann, V., Padmanabhan, M., Eds.; Springer: Dordrecht, The Netherlands, 2009; pp. 109–126.
17. Lockwood, M.; Davidson, J.; Curtis, A.; Stratford, E.; Griffith, R. Multi-level environmental governance: Lessons from Australian natural resource management. *Aust. Geogr.* **2009**, *40*, 169–186, doi:10.1080/00049180902964926.
18. Johansson, J. Collaborative governance for sustainable forestry in the emerging bio-based economy in Europe. *Curr. Opin. Environ. Sustain.* **2018**, *32*, 9–16, doi:10.1016/j.cosust.2018.01.009.
19. Di Gregorio, M.; Fatorelli, L.; Paavola, J.; Locatelli, B.; Pramova, E.; Nurrochmat, D.R.; May, P.H.; Brockhaus, M.; Sari, I.M.; Kusumadewi, S.D. Multi-level governance and power in climate change policy networks. *Glob. Environ. Chang.* **2019**, *54*, 64–77, doi:10.1016/j.gloenvcha.2018.10.003.
20. Rhodes, R.A.W. Understanding governance: Ten years on. *Organ. Stud.* **2007**, *28*, 1243–1264, doi:10.1177/0170840607076586.
21. Pahl-Wostl, C. A Conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Glob. Environ. Chang.* **2009**, *19*, 354–365, doi:10.1016/j.gloenvcha.2009.06.001.
22. Klijn, E.-H.; Koppenjan, J. Governance network theory: Past, present and future. *Policy Politics* **2012**, *40*, 587–606, doi:10.1332/030557312 × 655431.
23. Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action;* Political Economy of Institutions and Decisions; Cambridge University Press: Cambridge, UK, 1990, doi:10.1017/CBO9780511807763.
24. Graham, J.; Amos, B.; Plumptre, T. *Governance Principles for Protected Areas in the 21st Century: A Discussion Paper*; Institute on Governance: Ottawa, ON, Canada, 2003; 50p.
25. Böhling, K.; Arzberger, M.B. New modes of governance in Bavaria's Alpine forests: The 'mountain forest initiative' at work. *For. Policy Econ.* **2014**, *49*, 43–50. doi:10.1016/j.forpol.2014.01.004.
26. Ansell, C.; Gash, A. Collaborative governance in theory and practice. *J. Public Adm. Res. Theory* **2007**, *18*, 543–571.
27. Jones, C.; Hesterly, W.S.; Borgatti, S.P. A general theory of network governance: Exchange conditions and social mechanisms. *Acad. Manag. Rev.* **1997**, *22*, 911–945, doi:10.2307/259249.
28. Bogason, P.; Musso, J.A. The democratic prospects of network governance. *Am. Rev. Public Adm.* **2006**, *36*, 3–18, doi:10.1177/0275074005282581.
29. Newig, J.; Günther, D.; Pahl-Wostl, C. Synapses in the network: Learning in governance networks in the context of environmental management. *E&S* **2010**, *15*, art24. doi:10.5751/ES-03713-150424.
30. Marks, G. Structural policy and multilevel governance in the EC. In *The State of the European Community*; Cafruny, A., Rosenthal, G., Eds.; Longman: Harlow, UK, 1993; Volume 2.
31. Bache, I.; Flinders, M. *Multi-Level Governance*; Oxford University Press: Oxford, UK, 2004, doi:10.1093/0199259259.001.0001.
32. Bernstein, S.; Cashore, B. Examination of the influences of global forest governance arrangements at the domestic level. In *Embracing Complexity: Meeting the Challenges of International Forest Governance*; IUFRO World Series 28; Rayner, J., Buck, A., Katila, P., Eds.; IUFRO Secretariat: Vienna, Austria, 2010; pp. 111–135.

33. Pezdevšek Malovrh, Š.; Paletto, A.; Posavec, S.; Dobšinská, Z.; Đorđević, I.; Marić, B.; Avdibegović, M.; Kitchoukov, E.; Stijović, A.; Trajkov, P.; et al. Evaluation of the operational environment factors of nature conservation policy implementation: Cases of selected EU and non-EU countries. *Forests* **2019**, *10*, 1099, doi:10.3390/f10121099.
34. Neil Adger, W.; Arnell, N.W.; Tompkins, E.L. Successful adaptation to climate change across scales. *Glob. Environ. Chang.* **2005**, *15*, 77–86, doi:10.1016/j.gloenvcha.2004.12.005.
35. Pülzl, H.; Dominguez, G. Interrelations of actors and organisations in the European Union and Pan-Europe with regards to forest policy-making. In *European Forest Governance: Issues at Stake and the Way Forward*; EFI Series: What Science Can Tell Us 2; Pülzl, H., Hogl, K., Kleinschmit, D., Wydra, D., Arts, B., Mayer, P., Palahi, M., Winkel, G., Wolfslehner, B., Eds.; European Forest Institute: Joensuu, Finland, 2013; pp. 64–74.
36. Kleinschmit, D.; Edwards, P. Pan-European forest-focused and forest related policies. In *European Forest Governance: Issues at Stake and the Way Forward*; EFI Series: What Science Can Tell Us 2; Pülzl, H., Hogl, K., Kleinschmit, D., Wydra, D., Arts, B., Mayer, P., Palahi, M., Winkel, G., Wolfslehner, B., Eds.; European Forest Institute: Joensuu, Finland, 2013; pp. 45–51.
37. Mostert, E. Who should do what in environmental management? Twelve principles for allocating responsibilities. *Environ. Sci. Policy* **2015**, *45*, 123–131, doi:10.1016/j.envsci.2014.10.008.
38. Fliervoet, J.M.; Geerling, G.W.; Mostert, E.; Smits, A.J.M. Analyzing collaborative governance through social network analysis: A case study of river management along the Waal river in The Netherlands. *Environ. Manag.* **2016**, *57*, 355–367, doi:10.1007/s00267-015-0606-x.
39. Meadowcroft, J. *Climate Change Governance*; Policy Research Working Papers; The World Bank: Washington, DC, USA, 2009, doi:10.1596/1813-9450-4941.
40. Keskitalo, E.C.H. Introduction: adaptation to climate change in Europe: Theoretical framework and study design. In *Developing Adaptation Policy and Practice in Europe: Multi-Level Governance of Climate Change*; Keskitalo, H.E.C., Ed.; Springer: Dordrecht, The Netherlands, 2010; pp. 1–38.
41. Nedeljković, J.; Stanišić, M. Forest and climate change governance. In *Climate Action*; Leal Filho, W., Azeiteiro, U., Azul, A.M., Brandli, L., Özuyar, P.G., Wall, T., Eds.; Springer International Publishing: Cham, Switzerland, 2018; pp. 1–21, doi:10.1007/978-3-319-71063-1_69-1.
42. Ostrom, E. A Multi-scale approach to coping with climate change and other collective action problems. *Solutions* **2010**, *1*, 27–36.
43. Corfee-Morlot, J.; Kamal-Chaoui, L.; Donovan, M.G.; Cochran, I.; Robert, A.; Teasdale, P.J. *Cities, Climate Change and Multilevel Governance*; OECD Environment Working Papers; OECD: Paris, France, 2009; p. 125.
44. Gudurić, I. The Perception of Decision-Makers to Climate Change Adaptation in Urban and Periurban Forests of Belgrade. Master's Thesis, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria, 2013.
45. Nonic, D.; Stanisic, M.; Nedeljkovic, J.; Rankovic, N. Cooperation in the climate change mitigation in forestry and nature protection at different levels of governance. *Glas. Sumar. Fak.* **2017**, *116*, 99–140, doi:10.2298/GSF1716099N.
46. Nedeljković, J.; Pezdevšek Malovrh, Š.; Curman, M.; Avdibegović, M.; Nonić, D.; Stanišić, M. Climate change governance in forestry and nature conservation: Institutional framework in selected see countries. *Sumar. List* **2019**, *143*, 445–459.
47. Mutabdžija, S. Defining the Set of Forest Governance Principles in Forestry Sector of the Federation of Bosnia-Herzegovina. Master's Thesis, Faculty of Forestry of the University of Sarajevo, Sarajevo, Bosnia and Herzegovina, 2012.
48. Louman, B.; Keenan, R.J.; Kleinschmit, D.; Atmadja, S.; Sitoe, A.A.; Nhantumbo, I.; Velozo, R.d.C.; Morales, J.P. SDG 13: Climate action—Impacts on forests and people. In *Sustainable Development Goals: Their Impacts on Forests and People*; Pierce Colfer, C.J., Winkel, G., Galloway, G., Pacheco, P., Katila, P., de Jong, W., Eds.; Cambridge University Press: Cambridge, UK, 2019; pp. 419–444.
49. Simpson, H.; de Loë, R. The agricultural community as a social network in a collaborative, multi-stakeholder problem-solving process. *Water* **2017**, *9*, 750, doi:10.3390/w9100750.
50. Moote; Lowe, K. *Issues in Forest Restoration: What to Expect from Collaboration in Natural Resource Management: A Research Synthesis for Practitioners*; NAU Ecological Restoration Institute: Flagstaff, AZ, USA, 2008.
51. Enserink, B.; Hermans, L.; Bots, P.; Koppenjan, J.; Kwakkel, J.; Thissen, W. *Policy Analysis of Multi-Actor Systems*; Eleven International Pub: den Haag, the Netherlands, 2010.
52. Reed, M.S.; Graves, A.; Dandy, N.; Posthumus, H.; Hubacek, K.; Morris, J.; Prell, C.; Quinn, C.H.; Stringer, L.C. Who's in and why? A typology of stakeholder analysis methods for natural resource management. *J. Environ. Manag.* **2009**, *90*, 1933–1949, doi:10.1016/j.jenvman.2009.01.001.
53. Prell, C.; Hubacek, K.; Reed, M. Stakeholder analysis and social network analysis in natural resource management. *Soc. Nat. Resour.* **2009**, *22*, 501–518, doi:10.1080/08941920802199202.
54. Reed, M.S.; Curzon, R. Stakeholder mapping for the governance of biosecurity: A literature review. *J. Integr. Environ. Sci.* **2015**, *12*, 15–38, doi:10.1080/1943815X.2014.975723.
55. Raum, S. A framework for integrating systematic stakeholder analysis in ecosystem services research: Stakeholder mapping for forest ecosystem services in the UK. *Ecosyst. Serv.* **2018**, *29*, 170–184, doi:10.1016/j.ecoser.2018.01.001.
56. Laktić, T.; Žiberna, A.; Kogovšek, T.; Pezdevšek Malovrh, Š. Stakeholders' social network in the participatory process of formulation of Natura 2000 Management Programme in Slovenia. *Forests* **2020**, *11*, 332, doi:10.3390/f11030332.
57. Bulkeley, H. Climate policy and governance: An editorial essay: Climate policy and governance. *Wires Clim. Chang.* **2010**, *1*, 311–313, doi:10.1002/wcc.1.

58. Andonova, L.B.; Betsill, M.M.; Bulkeley, H. Transnational climate governance. *Glob. Environ. Politics* **2009**, *9*, 52–73, doi:10.1162/glep.2009.9.2.52.
59. Kuyper, J.W.; Linnér, B.-O.; Schroeder, H. Non-state actors in hybrid global climate governance: Justice, legitimacy, and effectiveness in a post-Paris era: Non-state actors in hybrid global climate governance. *Wires Clim. Chang.* **2018**, *9*, e497, doi:10.1002/wcc.497.
60. Paletto, A.; Balest, J.; Demeo, I.; Giacovelli, G.; Grilli, G. Power of forest stakeholders in the participatory decision making process: A case study in northern Italy. *Acta Silv. Lignaria Hung.* **2016**, *12*, 9–22, doi:10.1515/aslh-2016-0002.
61. Borg, R.; Toikka, A.; Primmer, E. Social capital and governance: A social network analysis of forest biodiversity collaboration in central Finland. *For. Policy Econ.* **2015**, *50*, 90–97, doi:10.1016/j.forpol.2014.06.008.
62. Hauck, J.; Schmidt, J.; Werner, A. Using social network analysis to identify key stakeholders in agricultural biodiversity governance and related land-use decisions at regional and local level. *E&S* **2016**, *21*, art49, doi:10.5751/ES-08596-210249.
63. Laktić, T.; Pezdevšek Malovrh, Š. Stakeholder participation in Natura 2000 Management Program: Case study of Slovenia. *Forests* **2018**, *9*, 599, doi:10.3390/f9100599.
64. Knoke, D.; Kuklinski, J.H. Network analysis: basic concepts. In *Markets, Hierarchies & Networks: The Coordination of Social Life*; Thompson, G., Frances, J., Levacic, R., Mitchell, J., Eds.; SAGE: Thousand Oaks, CA, USA, 1991; pp. 173–182.
65. Provan, K.G.; Huang, K.; Milward, H.B. The evolution of structural embeddedness and organizational social outcomes in a centrally governed health and human services network. *J. Public Adm. Res. Theory* **2009**, *19*, 873–893, doi:10.1093/jopart/mun036.
66. Juhola, S.; Westerhoff, L. Challenges of adaptation to climate change across multiple scales: A case study of network governance in two European countries. *Environ. Sci. Policy* **2011**, *14*, 239–247, doi:10.1016/j.envsci.2010.12.006.
67. Cunningham, R.; Cvitanovic, C.; Measham, T.; Jacobs, B.; Dowd, A.-M.; Harman, B. Engaging communities in climate adaptation: The potential of social networks. *Clim. Policy* **2016**, *16*, 894–908, doi:10.1080/14693062.2015.1052955.
68. Živojinović, I.; Wolfslehner, B.; Tomićević-Dubljević, J.; Social and policy aspects of climate change adaptation in urban forests of Belgrade. *SEEFOR* **2015**, *6*, 219–235, doi:10.15177/seefor.15-20.
69. Gray, B. The pathways of my research: A journey of personal engagement and change. *J. Appl. Behav. Sci.* **1989**, *25*, 383–398, doi:10.1177/002188638902500406.
70. Brugha, R. Stakeholder analysis: A review. *Health Policy Plan.* **2000**, *15*, 239–246, doi:10.1093/heapol/15.3.239.
71. Grimble, R.; Wellard, K. Stakeholder methodologies in natural resource management: A review of principles, contexts, experiences and opportunities. *Agric. Syst.* **1997**, *55*, 173–193, doi:10.1016/S0308-521X(97)00006-1.
72. Weible, C.M. Beliefs and perceived influence in a natural resource conflict: An advocacy coalition approach to policy networks. *Political Res. Q.* **2005**, *58*, 461–475, doi:10.1177/106591290505800308.
73. Mitchell, W.C. Interest groups: Economic perspectives and contributions. *J. Theor. Politics* **1990**, *2*, 85–108, doi:10.1177/0951692890002001004.
74. Grimble, R.; Chan, M.; Aglionby, J.; Quan, J. *Trees and Trade-Offs: A Stakeholder Approach to Natural Resource Management*; Institute for Environment and Development: London, UK, 1995.
75. Lienert, J.; Schnetzer, F.; Ingold, K. Stakeholder analysis combined with social network analysis provides fine-grained insights into water infrastructure planning processes. *J. Environ. Manag.* **2013**, *125*, 134–148, doi:10.1016/j.jenvman.2013.03.052.
76. Wasserman, S.; Faust, K. *Social Network Analysis: Methods and Applications*; Structural Analysis in the Social Sciences; Cambridge University Press: Cambridge, UK, 1994.
77. Freeman, R.E. The Stakeholder Approach Revisited. *Z. Wirtsch. Unternehm.* **2004**, *5*, 228–241, doi:10.5771/1439-880X-2004-3-228.
78. Harary, F.; Norman, R.; Cartwright, D. *Structure Models: An Introduction to the Theory of Directed Graphs*; Wiley: New York, NY, USA, 1965.
79. Scott, J.; Carrington, P. *The SAGE Handbook of Social Network Analysis*; SAGE Publications Ltd.: London, UK, 2014.
80. Ibarra, H.; Andrews, S.B. Power, social influence, and sense making: Effects of network centrality and proximity on employee perceptions. *Adm. Sci. Q.* **1993**, *38*, 277–303, doi:10.2307/2393414.
81. Newman, M.E.J. The structure of scientific collaboration Networks. *Proc. Natl. Acad. Sci. USA* **2001**, *98*, 404, doi:10.1073/pnas.98.2.404.
82. Goyal, S. *The SAGE Handbook of Social Network Analysis*; SAGE Publications Ltd.: London, UK, 2021, doi:10.4135/9781446294413.
83. De Nooy, W.; Mrvar, A.; Batagelj, V. *Exploratory Social Network Analysis with Pajek: Revised and Expanded Edition for Updated Software*, 3rd ed.; Structural Analysis in the Social Sciences; Cambridge University Press: Cambridge, UK, 2018, doi:10.1017/9781108565691.
84. Crona, B.; Bodin, Ö. What you know is who you know? Communication patterns among resource users as a prerequisite for co-management. *E&S* **2006**, *11*, art7, doi:10.5751/ES-01793-110207.
85. Lovrić, M.; Lovrić, N.; Mavsar, R. Mapping forest-based bioeconomy research in Europe. *For. Policy Econ.* **2020**, *110*, 101874. doi:10.1016/j.forpol.2019.01.019.
86. Rowley, T.J. Moving beyond dyadic ties: A network theory of stakeholder influences. *Acad. Manag. Rev.* **1997**, *22*, 887.
87. Svendsen, A.C.; Laberge, M. Convening stakeholder networks. *J. Corp. Citizsh.* **2005**, *2005*, 91–104, doi:10.9774/gleaf.4700.2005.au.00013.
88. Dos Muchangos, L.S.; Tokai, A.; Hanashima, A. Stakeholder analysis and social network analysis to evaluate the stakeholders of a MSWM system—A pilot study of Maputo city. *Environ. Dev.* **2017**, *24*, 124–135. doi:10.1016/j.envdev.2017.04.005.

89. Ritchie, J.; Lewis, J. (Eds.). *Qualitative Research Practice: A Guide for Social Science Students and Researchers*; SAGE Publications Ltd.: London, UK, 2003; ISBN: 0 7619 7109 2.
90. Ackermann, F.; Eden, C. Strategic management of stakeholders: Theory and practice. *Long Range Plan.* **2011**, *44*, 179–196, doi:10.1016/j.lrp.2010.08.001.
91. Borgatti, S.; Everett, M.; Freeman, L. *Ucinet for Windows: Software for Social Network Analysis*; Analytic Technologies: Harvard, MA, USA, 2002.
92. Albert, R.; Jeong, H.; Barabási, A.-L. Error and attack tolerance of complex networks. *Nature* **2000**, *406*, 378–382, doi:10.1038/35019019.
93. Olsson, P.; Folke, C. Local ecological knowledge and institutional dynamics for ecosystem management: A study of Lake Racken Watershed, Sweden. *Ecosystems* **2001**, *4*, 85–104, doi:10.1007/s100210000061.
94. Ernstson, H.; Sörlin, S.; Elmqvist, T. Social movements and ecosystem services: The role of social network structure in protecting and managing Urban Green Areas in Stockholm. *E&S* **2008**, *13*, art39, doi:10.5751/ES-02589-130239.
95. Leavitt, H.J. Some effects of certain communication patterns on group performance *J. Abnorm. Soc. Psychol.* **1951**, *46*, 38–50.
96. Lähtinen, K.; Toppinen, A.; Suojanen, H.; Stern, T.; Ranacher, L.; Burnard, M.; Kitek Kuzman, M. Forest sector sustainability communication in Europe: A systematic literature review on the contents and gaps. *Curr. For. Rep.* **2017**, *3*, 173–187, doi:10.1007/s40725-017-0063-2.
97. Sandström, C.; Lindkvist, A.; Öhman, K.; Nordström, E.-M. Governing competing demands for forest resources in Sweden. *Forests* **2011**, *2*, 218–242. doi:10.3390/f2010218.
98. Gray, B. Conditions facilitating interorganizational collaboration. *Hum. Relat.* **1985**, *38*, 911–936. doi:10.1177/001872678503801001.
99. Bodin, Ö.; Crona, B.I. The role of social networks in natural resource governance: What relational patterns make a diference? *Glob. Environ. Chang.* **2009**, *19*, 366–374.
100. Granovetter, M. Economic action and social structure: The problem of embeddedness. *Am. J. Sociol.* **1985**, *91*, 481–510.
101. Bodin, Ö.; Crona, B.I. Management of natural resources at the community level: Exploring the role of social capital and leadership in a rural fishing community. *World Dev.* **2008**, *36*, 2763–2779, doi:10.1016/j.worlddev.2007.12.002.
102. Oh, H.; Chung, M.-H.; Labianca, G. Group social capital and group effectiveness: The role of informal socializing ties. *Acad. Manag. J.* **2004**, *47*, 860–875, doi:10.2307/20159627.
103. Bodin, Ö.; Norberg, J. Information network topologies for enhanced local adaptive management. *Environ. Manag.* **2005**, *35*, 175–193, doi:10.1007/s00267-004-0036-7.
104. Grafton, R.Q. Social capital and fisheries governance. *Ocean Coast. Manag.* **2005**, *48*, 753–766, doi:10.1016/j.ocecoaman.2005.08.003.
105. Schneider, M.; Scholz, J.; Lubell, M.; Mindruta, D.; Edwardsen, M. Building consensual institutions: Networks and the national estuary program. *Am. J. Political Sci.* **2003**, *47*, 143–158, doi:10.1111/1540-5907.00010.
106. Woolcock, M. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory Soc.* **1998**, *27*, 151–208, doi:10.1023/A:1006884930135.
107. Woolcock, M. The place of social capital in understanding social and economic outcomes. *ISUMA Can. J. Policy Res.* **2001**, *2*, 11–17.
108. Mwangi, E.; Wardell, A. Multi-level governance of forest resources. *Int. J. Commons* **2012**, *6*, 79–103, doi:10.18352/ijc.374.
109. Pretty, J.; Ward, H. Social capital and the environment. *World Dev.* **2001**, *29*, 209–227, doi:10.1016/S0305-750X(00)00098-X.
110. Klijn, E.H.; Steijn, B.; Edelenbos, J. The impact of network management on outcomes in governance networks. *Public Adm.* **2010**, *88*, 1063–1082, doi:10.1111/j.1467-9299.2010.01826.x.
111. Koeszegi, S.T. Trust-building strategies in inter-organizational negotiations. *J. Manag. Psychol.* **2004**, *19*, 640–660, doi:10.1108/02683940410551534.
112. Baird, J.; Plummer, R.; Bodin, Ö. Collaborative governance for climate change adaptation in Canada: Experimenting with adaptive co-management. *Reg. Environ. Chang.* **2016**, *16*, 747–758, doi:10.1007/s10113-015-0790-5.
113. Yaffee, S.L.; Wondolleck, J.M. Making collaboration work: Lessons from a comprehensive assessment of over 200 wideranging cases of collaboration in environmental management. *Conserv. Pract.* **2000**, *1*, 17–24, doi:10.1111/j.1526-4629.2000.tb00156x.
114. Trimble, M.; Berkes, F. Participatory research towards co-management: Lessons from artisanal fisheries in Coastal Uruguay. *J. Environ. Manag.* **2013**, *128*, 768–778, doi:10.1016/j.jenvman.2013.06.032.
115. Davenport, M.A.; Leahy, J.E.; Anderson, D.H.; Jakes, P.J. Building trust in natural resource management within local communities: A case study of the Midewin National Tallgrass Prairie. *Environ. Manag.* **2007**, *39*, 353–368, doi:10.1007/s00267-006-0016-1.
116. Broto, V.C.; Macucule, D.A.; Boyd, E.; Ensor, J.; Allen, C. Building collaborative partnerships for climate change action in Maputo, Mozambique. *Environ. Plan. A* **2015**, *47*, 571–587, doi:10.1068/a140070p.
117. Gaillard, J.C.; Monteil, C.; Perrillat-Collomb, A.; Chaudhary, S.; Chaudhary, M.; Chaudhary, O.; Giazzi, F.; Cadag, J.R.D. Participatory 3-dimension mapping: A tool for encouraging multi-caste collaboration to climate change adaptation and disaster risk reduction. *Appl. Geogr.* **2013**, *45*, 158–166, doi:10.1016/j.apgeog.2013.09.009.
118. Grygoruk, M.; Rannow, S. Mind the Gap! lessons from science-based stakeholder dialogue in climate-adapted management of wetlands. *J. Environ. Manag.* **2017**, *186*, 108–119, doi:10.1016/j.jenvman.2016.10.066.

119. Hermansen, E.; McNeill, D.; Kasa, S.; Rajão, R. Co-operation or co-optation? NGOs' roles in Norway's international climate and forest initiative. *Forests* **2017**, *8*, 64, doi:10.3390/f8030064.
120. Cent, J.; Mertens, C.; Niedziałkowski, K. Roles and impacts of non-governmental organizations in Natura 2000 implementation in Hungary and Poland. *Environ. Conserv.* **2013**, *40*, 119–128, doi:10.1017/S0376892912000380.
121. Manolache, S.; Nita, A.; Ciocanea, C.M.; Popescu, V.D.; Rozylowicz, L. Power, influence and structure in Natura 2000 governance networks. A comparative analysis of two protected areas in Romania. *J. Environ. Manag.* **2018**, *212*, 54–64, doi:10.1016/j.jenvman.2018.01.076.