

Enhancing policy instruments and stakeholder collaboration for climate change governance in selected forest regions and national parks in Serbia

Mirjana Stanišić¹, Jelena Nedeljković^{2*}, Dragan Nonić², Ivana Živojinović^{3,4,5}

¹Maastricht University, Maastricht School of Management, Tapijnkazerne 11, NL-6211 ME Maastricht, The Netherlands

²University of Belgrade, Faculty of Forestry, Kneza Viseslava 1, 11030 Belgrade, Republic of Serbia

³BOKU University, Department of Economics and Social Sciences, Institute of Forest, Environmental and Natural Resource Policy, Feistmantelstrasse 4, A-1180 Vienna, Austria

⁴European Forest Institute, Forest Policy Research Network, Feistmantelstrasse 4, A-1180 Vienna, Austria

⁵BOKU University, Center for Bioeconomy, Peter-Jordan-Straße 82/II, A-1190 Vienna, Austria

Abstract

The successful implementation of climate change (CC) policies and strategies in forestry and related sectors (nature conservation, environment, energy) may be hindered by a lack of appropriate regulatory, economic and informational policy instruments, weak cross-sectoral coordination, and limited stakeholder collaboration during their implementation. This study aims to assess opportunities to improve policy instruments and collaboration for CC governance in the forestry and related sectors in selected forest regions and national parks in Serbia. Data were collected in 2022 through 23 interviews with decision-makers, public and civil sector experts, and representatives of “good practice” examples of stakeholder collaboration in CC. The majority of respondents (87%) support the improvement of regulatory instruments through the development of agreements with local self-governments and different public and civil organizations, and outreach plans in forestry and related sectors. A large number of respondents (70%) advocate for greater variety of economic policy instruments involving local self-government in knowledge sharing programs and creating additional incentives for private forest owners. Informational policy instruments were endorsed by 91% of respondents, who emphasized the importance of local information exchanges, workshops, and forums to enhance community knowledge on CC governance. The majority of public and civil sector representatives (87%) recommend establishing cross-sectoral forums to improve dissemination of information and contacts between stakeholders. All respondents agree with the inclusion of civil sector representatives in the work of emergency management departments. Further research could investigate the feasibility of proposed solutions in the broader Serbian context among a wider group of stakeholders.

Key words: regulatory frameworks; economic incentives; informational exchange; stakeholder engagement; cross-sectoral coordination

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1. Introduction

Climate change (CC), caused by direct or indirect human activities that alter the global atmosphere, remains one of the most critical challenges of our time (1992). The Intergovernmental Panel on Climate Change (IPCC) has unequivocally linked human activities, particularly greenhouse gas emissions, to global warming, with global surface temperatures having risen by about 1.1 °C above pre-industrial levels between 2011 and 2020 (2021a). This warming has led to widespread and rapid changes

in the atmosphere, oceans, cryosphere, and biosphere, affecting both natural and human systems worldwide (2021b). Similarly, in its Global Risks Report 2024, the World Economic Forum (WEF) highlights CC as one of the greatest global risks, citing extreme weather events, critical changes to the Earth system and biodiversity loss as urgent challenges (2024a). The WEF also highlights the significant increase in atmospheric concentrations of greenhouse gases, including carbon dioxide, methane, and nitrous oxide, since the industrial era, driven by human activities (2021e). These findings underscore the

*Corresponding author. Jelena Nedeljković, e-mail: jelena.nedeljkovic@sfb.bg.ac.rs

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pressing need for coordinated global action to mitigate the severe impacts of CC on ecosystems, economies, and communities. The collective insights from the IPCC and WEF reinforce the critical importance of addressing this multifaceted crisis with urgency and innovation.

Study on CC in Serbia indicate changes in the average annual temperature, annual precipitation distribution as well as increasing risk of droughts, extreme precipitation and storms (with gusts of wind and hail) in the coming years (Milutinović 2023; Vuković-Vimić & Vujadinović-Mandić 2024). Addressing these challenges involves both mitigation and adaptation, with adaptation in forestry recognized as a particularly complex issue. Unlike mitigation, adaptation requires nuanced stakeholder interaction and cross-sectoral collaboration (Buizer & Lawrence 2013). This collaboration involves harmonizing sectoral interests and priorities, distributing responsibilities among stakeholders at various levels, and ensuring their equal participation in formulating and implementing policy instruments (Nonić et al. 2017; Pezdevšek Malovrh et al. 2019). In forestry, adaptation strategies often focus on reducing climate vulnerability and enhancing adaptive capacity (Adger et al. 2005). Vulnerability can be assessed across three dimensions: environmental, social (e.g., the presence of relevant and active institutions and the skills of forestry officials), and economic (e.g., funding and the valuation of forests) (Živojinović & Wolfslehner 2015). Social dimensions also encompass cognitive aspects such as perceptions and motivations, reflecting a system's capacity to cope with challenges (Hobson & Niemeyer 2011). The need for effective governance in adapting to CC highlights the importance of fostering collaboration, aligning policies, and empowering local communities (Pezdevšek Malovrh et al. 2019). This paper focuses particularly on these economic and social dimensions by exploring the perceptions of key forest experts and decision-makers.

Forest administration in Serbia includes institutions and organizations at different level of governance with competences related to CC: public administration, public services, enterprises and organizations for state forest and protected area governance, educational and research organizations and civil society organizations (Nonić et al. 2017; Nedeljković et al. 2019). At the public administration level, the Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection (MEP), and their subordinate organizational units deal with forestry and nature conservation, on a strategic level. The responsibilities of the Environmental Protection Agency and the Institute for Nature Protection at the public service level extend not only to forestry, but also to other sectors and the field of nature conservation. Public

enterprises (PE) in forestry – PE “Srbijašume”¹ and PE “Vojvodinašume”² are involved in the sustainable management of state forests. Protected areas are mostly managed by the public sector³ (Đorđević 2017). Each national park is managed by separate public enterprise (PE NP). In addition, educational and research institutions, such as the Faculty of Forestry and the Institute of Forestry, carry out educational and scientific activities. Civil society organizations address forestry and nature conservation issues, including issues related to CC, within their respective competencies and responsibilities. However, there is still a top-down approach to natural resource governance in Serbia, in which public sector organizations play a central role, while the private and civil sectors are less involved (Nedeljković et al. 2019).

Various regulatory, economic and informational policy instruments are required for the development and implementation of CC governance policies (Ledda et al. 2020), as they are one of the most important factors for mitigating negative effects and adapting to CC (Biesbroek et al. 2010). Their implementation requires “...political will, human and financial resources, good coordination between key actors” (Biesbroek et al. 2010). It is therefore necessary to improve policy instruments so that they also consider the aspects of cross-sectoral collaboration between stakeholders at different levels of governance in combating CC (Stanišić 2023). On the other hand, successful collaboration requires that stakeholders, who have different interests, perspectives and influences and sometimes belong to different sectors and governance levels, jointly define the goal and the implementation process itself (Schrujfer & Vansina 2008). The importance of multilevel cross-sectoral collaboration is also recognized from the perspective of implementing policies and strategies for dealing with CC governance in forestry and related sectors (Ranković et al. 2016; Nonić et al. 2017; Halušková et al. 2021). However, previous research shows that the society and local communities are insufficiently informed about the issue and the importance of combating CC (Milutinović 2018). As stakeholders at regional and local level play a key role in the implementation of CC governance policy instruments, it is necessary to build their capacities, create different forms of collaboration and harmonize their interests at all levels (Pezdevšek-Malovrh et al. 2019).

One of the defined problems in Serbia is the lack of *regulatory policy instruments* for the development of stakeholder collaboration from the public, civil and/or private sectors for CC governance (Nedeljković et al. 2020; Stanišić 2023). Both the Strategy for Low Carbon Development of the Republic of Serbia⁴ and the Nature

¹ PE “Srbijašume” through the forest estate offices (FE) and forest management unites (FME) on the local level, performs the activities in forestry and nature conservation in CC.

² The scope of work of PE “Vojvodinašume” covers the territory of AP Vojvodina.

³ The public sector manages 97.3%, and the private sector manages 2.7% of the total area of protected areas (Đorđević 2017).

⁴ The Strategy for Low Carbon Development of the Republic of Serbia for the period from 2023 to 2030 with projections until 2050 contains a set of regulatory instruments to improve energy efficiency and the use of renewable energy sources (2023b).

Protection Program of Republic of Serbia⁵, provide a set of regulatory policy instruments with a clear overview of the institutions and organizations that should be involved in the implementation, while the Law on Climate Change (2021g), prescribes the assessment of greenhouse gas (GHG) emissions at national, regional and local levels. Although the regulatory policy instruments refer to the involvement of different stakeholders in their implementation, but not from different governance levels, none of the instruments mentioned refer to the collaboration of stakeholders from the private and/or civil sector. The results of the analysis of respondents' attitudes did not reveal the existence of policy instruments that include the participation of stakeholders from the regional and local level of governance, especially PE and NGOs, in the preparation of local studies and action plans that also relate to the issue of CC (Stanišić 2023). Another defined problem is the lack of diversity of *economic policy instruments*, as they are not sufficiently present in all strategic and legislative documents of forestry and related sectors for CC governance (Stanišić 2023). In the field of CC, no economic policy instruments of stakeholder collaboration and multi-level governance were observed. Most economic policy instruments come from the state budget, while support from other funds (international programs and projects) is negligible. Some economic policy instruments are also available through projects for NGOs, mainly funded by MEP and local self-government (LS), and to a lesser extent by international foundations and agencies. Also, a small part of the economic policy instruments comes from the own budget and to a lesser extent from the funds of other sectors (e.g., the Fund for the Development of Agriculture), with the aim of using preventive policy instruments to protect against natural disasters (such as hail, frost, etc.). When analyzing the respondents' attitudes, it was found that the existing economic policy instruments are not coordinated between sectors and there is no system for the exchange of information on existing policy instruments between stakeholders from forestry and related sectors (Stanišić 2023).

There are two problems with *informational policy instruments*: there is limited support for exchange between stakeholders on existing initiatives and activities, and there are insufficient instruments for training forest sector stakeholders at regional and local governance level. In particular, there is a lack of cross-sectoral coordination in both the definition and implementation of informational policy instruments, except partially in the Low Carbon Development Strategy of the Republic of Serbia for the period from 2023 to 2030 with projections until 2050 (2023b), in which implementation partners for informational policy instruments are defined

(Nedeljković et al. 2020; Stanišić 2023). The analysis of the respondent's attitudes (Stanišić 2023) revealed that the responsibilities of organizations at the regional and local level with regard to CC governance are not clearly defined. In addition, it was found that there are few opportunities to share relevant information, data and initiatives in the fight against CC at regional and local level between the different sectors. A lack of educational activities targeting the needs of stakeholders at regional and local governance level was also identified, particularly in the forestry sector. Although informational policy instruments are used at regional and local level, the involvement of PE, LS and NGO representatives in their application is inconsistent.

When analyzing the forms of stakeholder *collaboration* at different governance levels in forestry and related sectors (Stanišić et al. 2021), a collaboration network of 128 different stakeholders from all three governance levels was identified. The analysis of stakeholders' collaboration network shows that the "central" stakeholders belong to the public sector, have the most contacts and have the greatest influence on CC governance. Stakeholders are more likely to collaborate if they belong to the same sector (public, civil, private), which indicates insufficiently developed inter-sectoral collaboration. The defined problem that emerges from the analysis of the 7 different areas identified for collaboration⁶ is the limited collaboration between stakeholders from public, civil and private sector in CC governance. The involvement of civil and private sector stakeholders in certain activities is negligible (Area 1 and Area 6). The frequency and continuity of educational activities (workshops, seminars) and expert consultations are not planned and organized, and members of the private sector and civil society are often not involved in these activities. Collaboration in some activities is based on personal contacts and their implementation depends on economic policy instruments (Area 3), while stakeholders (particularly from the local level) sometimes do not have enough experience to participate in the activities (Area 2). Another defined problem is the difficulty of exchanging information on joint activities between stakeholders. This is particularly evident at the regional and local level, as it is very difficult to obtain data on the work of other public organizations at the local level dealing with CC issues (Stanišić et al. 2021).

In this study, we extend the analysis of this previous research on the main challenges of CC governance in Serbia (Nonić et al. 2017; Nedeljković et al. 2020; Stanišić et al. 2021; Stanišić 2023). Therefore, this study goes further and proposes targeted solutions to improve policy instruments and stakeholder collaboration, focusing on

⁵The Nature Protection Program of the Republic of Serbia for the period from 2021 to 2023 mentions a regulatory policy instrument for the system for monitoring the impact of CC on biodiversity (2018a).

⁶Remediation of forest damages from ice breaks, floods and fires (Area 1); Workshops, seminars and expert knowledge exchange (Area 2); Tree planting, waste disposal and green space maintenance (Area 3); Project related activities (Area 4); Climate related data information exchange (Area 5); Information exchange with emergency management departments and divisions (Area 6); Information exchange concerning monitoring and precaution (Area 7) (Stanišić et al. 2021).

regulatory, economic and informational policy instruments to promote more effective collaboration. The aim of this study is to assess the opportunities for improving policy instruments and stakeholder collaboration in the governance of CC in forestry and related sectors in selected forest regions and national parks in Serbia. The analysis will provide an insight into the existing problems related to policy instruments and stakeholder collaboration and propose solutions for their improvement. According to the set goal, the main research questions were defined:

- How can policy instruments for CC governance in forestry and related sectors in selected forest regions and national parks in Serbia be improved?
- How can stakeholder collaboration in CC governance in forestry and related sectors in selected forest regions and national parks in Serbia be improved?

2. Conceptual framework

In examining the policy instruments and stakeholder collaboration for CC in forestry and related sectors, we use the concept of multi-level governance. Multi-level governance refers to the distribution of power between different levels⁷ of governance (vertical), but also between different actors (horizontal), which includes both the private and civil sectors (Bache & Flinders 2005). One of the key elements of multi-level governance are the different stakeholders that are, directly or indirectly involved in the governance process, depending on their responsibility and competencies (Wilder & Lankao 2006).

For CC issues to be integrated across multiple sectors and levels of governance, interactions and linkages between institutions at different levels and sectors involving different stakeholders are necessary (Keskitalo 2010; Saunders 2011). Established institutional frameworks, that define the responsibilities of stakeholders, have an impact on the creation of connections and linkages between stakeholders. The formulated strategies, laws, and policy instruments also have an impact on the creation of connections and the harmonization of stakeholders' interests in terms of their participation, decision-making and the use of resources in CC governance.

Collaboration can be defined as "...a process in which entities share information, resources and responsibilities to jointly plan, implement, and evaluate a program of activities to achieve a common goal" (Camarinha-Matos & Afsarmanesh 2008). Drawing on the concepts of Arnstein's "ladder" of citizen participation (Arnstein 1969), which states that joint participation is achieved through information, consultation, proposals, collaboration and empowerment of stakeholders, stakeholder collaboration can be seen as a form of participation in

which stakeholders are involved in setting priorities, and working together to fully understand the situation, resolve conflicts or find specific solutions to a particular problem or challenge (Koontz 2006). Creating different approaches to collaboration through sharing information, resources, and building trust between organizations, can be an important component of multilevel governance (Human & Provan 2000). Stakeholder collaboration at national, regional and local governance levels is also one of the essential elements to achieve national priorities in the fight against CC (Louman et al. 2019). In this paper we have explored the collaboration instruments between different stakeholders involved in the governance of CC in selected forest regions and national parks in Serbia.

Policy instruments are commonly distinguished as 1) regulatory, 2) economic and 3) informational based instruments, conceived as "sticks", "carrots" and the "sermons" of public policy (Vedung 1998). While regulatory policy instruments are prescribed by the strategies, laws and bylaws, they also influence the behavior of different actors (Bocher 2012; Nonić et al. 2017) by supporting acceptable actions or providing opportunities for further sanctions for non-compliance (Keskitalo et al. 2010). While economic policy instruments, refer to both direct (financial) and indirect (non-financial) support, they can also be used to further support various actions (Keskitalo et al. 2010). Informational policy instruments, through counseling, educational activities, awareness raising etc., influence knowledge development (Nonić et al. 2017), but also utilize the development of mutual voluntary or contractual agreements, partnerships, etc. (Boras & Edquist 2013).

Many EU-level strategic and legislative documents related to CC governance in forestry and related sectors contain regulatory instruments, that address aspects of stakeholder collaboration. They range from the explicit need to harmonize CC adaptation strategies between EU Member States (2021c), the coordination of activities between forestry and nature conservation to reduce GHG emissions (2020b), the improvement of forest management and adaptation to CC through the development of strategic plans at EU Member State level (2021d) to the Voluntary Partnership Agreement to combat illegal logging (2003b). The EU Biodiversity Strategy envisages to the planting of 3 billion trees in the EU by 2030 (2020a), while the 2030 Climate-Energy Framework refers to the participation of a broad range of sectors in reducing greenhouse gas emissions (2014).

Economic policy instruments enable the availability and deployment of investments through various funds, such as Invest EU funds for the private sector, the Cohesion Fund, the European Agricultural Fund for Rural Development, the LIFE program, etc. (2020b; 2020c; 2021f).

⁷The term "level" in the context of multilevel governance, often refers to the territorial units, communities, regions, federal and national state (Knieling & Filho 2013) and also national, regional and local governance level, including institutions and organizations from public, civil and private sector (Wilder & Lankao 2006).

Informational policy instruments relate to the connection, knowledge sharing, best practices and innovation with the aim of creating a climate-neutral EU and developing cooperation between EU Member States through dialog (2020b; 2021c; 2021f). The development and exchange of knowledge between stakeholders through digital platforms, participation in dialogs, workshops and in various programs of the Climate Education Coalition are also present (2018b; 2020d).

3. Methods

It is important to briefly present the background of policy instruments in Serbia in order to better understand the proposals for improving policy instruments and collaboration in CC governance in selected forest regions and national parks⁸.

3.1. Background on policy instruments in forestry and related sectors for CC governance in Serbia

In Serbia, the regulatory policy instruments refer to compliance with the EU ETS and/or the introduction of other carbon pricing instruments (2018a), and increasing the carbon sink through afforestation (2023b). They also point to the need to establish a Council for Forests to enable a broad range of stakeholders to participate in debates on forest sector development (2006), and to carry out various activities related to afforestation (2010a). Although aforementioned instruments support stakeholder collaboration, they are sparse when it comes to the involving the private and civil sectors (Stanisic et al. 2023).

Serbia is eligible for pre-accession assistance (IPA III), and the economic policy instruments relate to subsidies for biological works, afforestation, maintenance, land reclamation and rehabilitation (2006, 2010a) and the use of the Green Fund to reduce the impact of CC among others (2004). Although additional resources for sustainable forest management are available from funds such as the Green Climate Fund (financed by the Government of the Republic of Serbia and the FAO) and the EBRD Bank to support renewable energy, grants are also linked to progress on key reforms in the country (2024b). Therefore, funding for cohesion policy will

only be available after Serbia's accession to the EU. In terms of CC adaptation and mitigation, there is an apparent lack of financial instruments and capacity to promote low-carbon and climate-resilient development. There are some predictions that in the future a range of financial instruments available at EU level will be accessible to the private sector, such as green bonds, loans, blended finance, impact funds and impact investments, etc. (2023b).

Informational policy instruments in Serbia include consultations, facilitation of information exchange (Nonić et al. 2017; Stanišić et al. 2021) and efforts to raise stakeholder awareness of the impacts and consequences of CC at different governance levels and in different sectors, including forestry (2023a). These efforts also address aspects of GHG emissions reduction (2010b). They also include instruments to develop stakeholder collaboration at international and national level through projects (2004). Informational policy instruments for the exchange of information on the efficient use of bioenergy from forests, the promotion of cooperation with NGOs to raise public awareness of bioenergy and the transfer of new knowledge to stakeholders in the forestry sector are also available (2006).

3.2. Selection of respondents and data collection

For the purpose of this research, data was collected through in-depth expert interviews and includes respondents' views on policy instruments and collaboration in CC governance. A judgmental sample was used to select the interviewees. The following interviewees from forestry and related sectors (nature conservation, environment) were selected: decision-makers and experts⁹ from the public sector, experts from the civil sector (NGOs¹⁰), and examples of "good practices" of stakeholder collaboration in CC governance, at different levels (national, regional, local). The selection of examples of "good practices" was based on the following characteristics:

- 1) sector affiliation:
 - a. public sector:
 - i. PE for state forests management "Srbija-šume"¹¹, Belgrade;
 - ii. LS;
 - b. civil sector: NGOs;
- 2) lower influence compared to perceived interest in CC governance (Stanišić 2023);

⁸ Research was conducted in 3 national parks (National Park "Kopaonik", National Park "Tara" and National Park "Đerdap") and 11 forest regions where the share of damage caused by natural disasters (with emphasis on harmful effects of water, wind and fire) exceeds 1% (per area) (Stanišić et al. 2021). Forest regions are a geographical, natural and plan entity and they encompass the forests of all forms of ownership (2010a).

⁹ Decision-makers are representatives of institutions and organizations involved in the processes of adopting and implementing strategic and binding decisions (Rakić Žarković et al. 2016) in forestry and related sectors in the field of climate change governance, while experts are understood as independent professional staff, consultants, project managers, etc.

¹⁰ Selected NGOs deal with forestry, nature conservation, CC and environmental issues within their own competencies.

¹¹ Within the territorial framework of the research, the PE "Vojvodinašume" was excluded from primary data collection.

- 3) the general impression of the researcher, based on the conducted first phase of research (Stanišić 2023)¹² and
- 4) prominent “good practice” examples of stakeholder collaboration in CC.

Following the methodology of previous studies and defined problems¹³ (Nonić et al. 2017; Nedeljković et al. 2020; Stanišić et al. 2021; Stanišić 2023), the representatives of the private sector of forestry and related sectors were not selected, as the focus is on state forest damage caused by natural disasters. Small and medium-sized enterprises in forestry and other sectors are only users of forest products, and were therefore not relevant for this study.

In the period May–June 2022, 23 interviews were conducted with respondents from the public and civil sectors. Of the 17 representatives of institutions and organizations at national and regional governance level, 8 interviewees are involved in the process of making strategic and binding decisions (“decision-makers”), while 9 interviewees are involved in the process of implementing these decisions (“experts”). In addition, 6 respondents were representatives of organizations at the regional and local governance levels, which are considered examples of “good practices” (Table 1). Two questionnaires were used for data collection: the first for decision-makers, the second for experts and examples of “good practices”. The questionnaire for decision-makers consisted of 22 questions divided into four sections. Two sections were singled out for this study, namely: a) stakeholder

collaboration in CC governance (questions 15–17); b) policy instruments for CC governance (18–22).

The questionnaire for experts and examples of “good practices” consisted of 18 questions, divided into four sections, with two sections also being singled out, namely:

- 1) stakeholder collaboration in CC governance (questions 11–13);
- 2) policy instruments for CC governance (questions 14–18).

After summarizing and analyzing the responses, the respondents were grouped according to their attitude for each thematic question offered (“support”, “do not support”, “neutral”). An “advocate-opponent” matrix was used to present the responses (2011).

4. Results

Based on these results and the defined problems, suggestions were made for improving policy instruments and collaboration in CC governance in selected forest regions and national parks. The following subsections describe and analyze in the detail the possibilities of applying the solutions and the activities required to implement them. The matrix of the qualitative analysis of the attitudes of respondents from relevant institutions and organizations in forestry and related sectors, regarding the proposed solutions is presented in Table 2.

Table 1. List of respondents.

	Institution/Organization	Date	Code
Decision makers	Ministry of Environmental Protection	18.05.2022	MEP1
	Ministry of Agriculture, Forestry and Water Management – Directorate of Forests	27.05.2022	DF1
	— " —	24.05.2022	DF2
	Institute for Nature Conservation	20.05.2022	INC1
	Institute of Forestry	27.05.2022	IF1
	PE “NP Đerdap”	25.05.2022	PENPD
	PE “NP Kopaonik”	03.06.2022	PENPK
	PE “Srbijašume” – General directorate	19.05.2022	SŠD1
Experts	Ministry of Environmental Protection	03.06.2022	MEP2
	Institute for Nature Conservation	18.05.2022	INC2
	Institute of Forestry	27.05.2022	IF2
	PE “Srbijašume” – General directorate	19.05.2022	SŠD2
	— “ —	19.05.2022	SŠD3
	— “ —	19.05.2022	SŠD4
	PE “Vojvodinašume” – General directorate	14.05.2022	VŠD
Standing Conference of Towns and Municipalities (SCTM)	22.05.2022	NGO1	
	WWF program in Serbia	21.05.2022	NGO2
Examples of „best practice“	PE “Srbijašume”, FE “Timočke šume”	25.05.2022	FEB
	PE “Srbijašume”, FE “Timočke šume”, (main office)	25.05.2022	FMUZA
	PE “Srbijašume” FE “Severni Kučaj”, FMU “Kučevo”	26.05.2022	FMUKU
	Local self-government Kučevo	26.05.2022	LSKU
	NGO “Entuzijasti Kučeva”	26.05.2022	NGO3
	NGO “Timočki omladinski centar”	25.05.2022	NGO4

¹²Stakeholders at the national level have a pronounced interest and influence on CC governance, while the influence of stakeholders at the regional and local level is significantly lower (Stanišić et al. 2022).

¹³The focus was on the institutions and organizations, which are, within their own competences dealing with the issues of CC in the forestry and related sectors.

Table 2. Matrix of respondent's attitudes towards the suggested solutions.

Solution elements	Suggested solutions	Public sector									Civil sector	
		PA		LS	PS			PE			NGO	
		DF	MEP	LS	IF ¹⁴	ICN	PENP	SŠD	VŠD	FE	FMU	NGO
Improvement of the organization of system for policy instruments in climate change governance	Regulatory Policy instruments for development of collaboration between stakeholders from all 3 sectors in climate change governance	+ (1) +/- (1)	+ (1) +/- (1)	+ (1)	+ (2)	+ (2)	+ (2)	+ (4)	+ (1)	+ (1)	+ (1) +/- (1)	+ (4)
	Economic Increase in diversity of financial incentives for stakeholder collaboration	+ (1) - (1)	+ (1) +/- (1)	+/- (1)	+ (1) +/- (1)	+ (2)	+ (2)	+ (4)	+/- (1)	+ (1)	+/- (2)	+ (4)
	Informational Policy instruments for information exchange on existing initiatives and activities between stakeholders	+ (2)	+ (2)	+ (1)	+ (2)	+ (2)	+ (2)	+ (4)	+ (1)	+/- (1)	+ (1) +/- (1)	+ (4)
	Informational Policy instruments for education of stakeholders in forestry on regional and local governance levels	+ (2)	+ (2)	+ (1)	+ (2)	+ (1) +/- (1)	+ (2)	+ (4)	+ (1)	+ (1)	+ (2)	+ (4)
Improvement in collaboration	Improvement of dissemination of information and contacts between stakeholders	+ (1) +/- (1)	+ (2)	+ (1)	+ (1) +/- (1)	+ (2)	+ (2)	+ (3) +/- (1)	+ (1)	+ (1)	+ (2)	+ (4)
	Improvement in existing areas of stakeholder collaboration	+ (2)	+ (2)	+ (1)	+ (2)	+ (2)	+ (2)	+ (4)	+ (1)	+ (1)	+ (2)	+ (4)

Legend: + support, - do not support, +/- neutral attitude, (n) - number of respondents.

Abbreviations:

PA	Public Administration	ICN	Institute for nature conservation	FE	Forest Estate
DF	Ministry of Agriculture, Forestry and Water Management	PE	Public Enterprise	FEB	FE "Timočke šume"
		SŠD	PE "Srbijašume" - General directorate	FMUZA	FE "Timočke šume" - FMU "Zaječar"
MEP	Ministry of Environmental Protection	VŠD	PE "Vojvodinašume" - General directorate	FMUKU	FE "Severni Kučaj" - FMU Kučevo
LS	Local self-government	PENPĐ	PE "NP Đerdap"	FMU	Forest management Unit
PS	Public service	PENP	PE National Park	NGO	Non-governmental organization
IF	Institute of Forestry	PENPK	PE "NP Kopaonik"		

4.1 Improvement of policy instruments for climate change governance

To improve *regulatory policy instruments*, various activities have been proposed as part of the development of cross-sectoral stakeholder collaboration in CC governance. By signing the Covenant of Mayors for Climate and Energy at LS level and developing collaboration within the same sector (horizontal), the conditions for better CC governance will be created through the commitment to include mitigation and adaptation measures in the implementation. The proposed solution is based on an example of good practice in Croatia (2020d) and on the views of respondents on the need to improve policy instruments (Stanišić 2023). In addition, it is proposed to sign a collaboration agreement between PE "Srbijašume", the Faculty of Forestry and the Institute of Forestry in Belgrade to ensure continuous training of staff and PFO on CC issues. The involvement of experts in conducting specialised training in the form of seminars and workshops could cover various topics and areas, such as the development of action plans for adaptation to changed climate conditions, financial planning, fire management, control of protection against plant diseases and insects, etc. The proposed solution was observed in the accompa-

nying instruments of the strategic and legislative documents on CC governance at the EU level (2020c; 2021f) and is based on the respondents' suggestions (Stanišić 2023). With regard to the development of collaboration with the civil sector, it is proposed to sign a collaboration agreement between the bridging organization and local NGOs to raise public awareness in the fight against natural disasters. Such an example was observed in a study on the role of the local community and the problem of flash floods in Serbia (Stefanović et al. 2015). Although they are not legally binding, the proposed solutions (MoU, collaboration agreement) influence the definition of clear roles of the partners and the balance of power (Ohmer et al. 2023) and have a positive impact on the development of trust, especially in partnerships with organizations at lower governance level (Rosen 2010). In the case of Serbia, their implementation does not require government approval (Rodriguez et al. 2022), which also avoids administrative hurdles. Especially when multiple levels of public and private institutions and organizations are involved, the implementation of MoUs can be chosen as a form of agreement to promote policy learning (Picciotto 2008). It is also suggested to develop a public relation plan for forestry and related sectors that includes various ways to disseminate information and raise public

¹⁴Some of the activities of the Institute of Forestry (IF), that is part of the public service, were observed.

awareness on CC issues. An example of good practice was observed in Croatia (2003a).

The majority of respondents from the public and civil sectors (87%) are in favor of the proposal to improve collaboration between public, civil and/or private actors at different levels of CC governance. In contrast to the civil sector representatives who support this proposal, it was observed that some public sector representatives have a neutral attitude towards some of these activities. The public administration representative believes that LS should launch an initiative to sign the Mayor's Agreement for Climate and Energy (MEP1). On the other hand, the civil service and LS representatives emphasize that the government initiative is necessary to encourage existing staff to share information and best practices on these issues (LSKU, IF2). The NGO representative points out that the implementation of the proposed activity would encourage better implementation of individual NGO initiatives that impact LS links (NGO1). Regarding the signing of collaboration agreement between the PE for managing state forests and educational organizations, respondents from the public service and the PE believe that a planned approach to education (IF1) involving research organizations to improve knowledge at the regional and local level (VŠD) is necessary. Regarding the memorandum on collaboration between the bridging organization of local NGOs, the respondents from the public and civil sectors are positive and emphasize that in this way the neglected role of NGOs would increase (DF1), from the aspect of knowledge exchange and project preparation (VŠD), but also in the dissemination of information and knowledge at the local level (NGO1). Regarding the proposal to develop a public relations plan for forestry and related sectors, the public sector representatives believe that it already exists at the PE level (DF2), i.e. PE Srbijašume (FMUKU). Representatives of the public administration, LS, public service, PE and NGOs point out that it is necessary to "...disseminate information on the importance of the forest sector in relation to CC" (SŠD1), which would "...promote various initiatives at the level of public services and PE in terms of sharing information to the general public" (INC1). It is also said that such a plan could potentially influence the development of collaboration with the private sector in CC governance (NGO2).

Improving *economic policy instruments* refers to increasing the diversity of financial incentives. In addition to funds from the budgets of the relevant ministries, it is proposed to support LS in the development of CC adaptation plans through the Horizon program, and to obtain funding from the European Commission by signing the Covenant of Mayors. An example of good practice has been observed in Croatia (2020d) and in the EU (2020b). It is also proposed to provide financial incentives for PFOs for the care and protection of forests after natural disasters, and the application of forestry instruments to increase the adaptive capacity of forests. One

such example was observed in Slovenia (2008). Although a large number of respondents (70%) have a positive attitude, it should be noted that some public sector representatives have a neutral attitude towards this proposal. It was emphasized that the human capacities "in most LS are insufficient in terms of implementing activities and using financial incentives" (LSKU), but also that "this proposal could be a good opportunity to involve the private sector" (VŠD). When it comes to incentivizing PFOs to care for and protect forests from natural disasters, both the public administration representative and some PE representatives believe that although incentives exist, PFOs do not use them to a sufficient extent (DF2, FMUKU, FMUZA). However, other PE representatives emphasize that the existing policy instruments could be expanded in order to achieve a better impact in terms of protection against natural disasters (PENPK, PENPD, VŠD, SŠD3).

Two solutions have been proposed to improve *informational policy instruments*. In order to improve instruments to support the exchange of information on existing initiatives and activities between stakeholders, it is proposed to include information on activities related to CC governance at regional and local level in the internet platforms of parent organizations (PE "Srbijašume" – FE, FMU), city and municipal administrations and NGOs. An example of good practice was observed in Croatia on the internet platform of Croatian Forests (Hrvatske šume 2022b) and Dubrovnik-Neretva County (2022a). The improvement of stakeholder education refers to the organization of trainings, workshops, discussions and forums with educational and research institutions such as the Faculty of Forestry, the Institute of Forestry in Belgrade and the Institute for Nature Protection in Serbia, according to a clear plan and needs at the regional and local level in terms of CC governance. In addition, it is necessary to involve stakeholders at the regional and local level in the development and implementation of research projects. The proposed solution is based on the ideas of the respondents (Stanišić 2023). An example of good practice in Slovenia was also observed in relation to supporting expansion of research and development activities involving stakeholders at different levels of governance in the forest sector (2007).

The majority of respondents from the public and civil sectors (91%) support (with the exception of 2 representatives of PE who are neutral) the proposal to improve the policy instruments for sharing information on existing initiatives and activities between stakeholders by including information on activities related to CC governance at regional and local level in the internet platforms of parent organizations (PE "Srbijašume" – FE, FMU), city and municipal administrations and NGOs. Respondents from the public sector believe that there is "...a lack of human capacity for this kind of work" (FEB), but possibly also a lack of interest and initiative on the part of employees (IF1). Respond-

ents from the public administration and public service believe that such activities would lead to more effective problem solving at local and regional level (MEP2), more transparency and better positioning of the organization at local and regional level (INC2, PENPK), but also more communication (NGO2). The majority of respondents from the public and civil sectors (96%) support the proposal to improve policy instruments for the training of stakeholders in the forestry sector at regional and local governance level. The representative of the public administration points out that it is necessary to increase knowledge (MEP1), while the representatives of PE and NGOs believe that it is also necessary to assign competences and increase the motivation of employees (SSD2, NGO2). The majority of respondents are in favor of involving stakeholders from forestry and related sectors at regional and local governance levels in the development and implementation of projects. In this sense, it is emphasized that such a proposal is very good, especially for PE employees, which would “...increase the contribution of the work of local organizations and motivate employees” (PENPK), but also promotes the need for “...planning of human resources in terms of participation in projects” (SŠD3), while developing new, necessary skills (IF1, PENPK).

4.2. Improvement of collaboration for climate change governance

The proposed solutions for improving collaboration between stakeholders are: a) improving the dissemination of information and contacts between stakeholders and b) improving existing areas of collaboration between stakeholders. The proposed solutions for enhancing collaboration are linked to solutions related to the improvement of policy instruments as well as the establishment of a “bridging” organization¹⁵ (Stanišić 2023), namely by creating conditions for:

- increasing stakeholder influence on CC governance through joint consultations and participation in decision-making;
- improving existing and creating new contacts and links between stakeholders at national, regional and local governance level through information exchange, consultations and proposals;
- building trust between stakeholders;
- disseminating information and raising public awareness of CC issues.

In order to *improve the dissemination of information and contacts between stakeholders* and to create the conditions for the further development of collaboration at regional and local level, the organization of cross-secto-

ral forums is proposed. Cross-sectoral forums are one of the tools for developing partnerships between different stakeholders. Such forums would provide an opportunity for stakeholders from different sectors to present their views and get advice from experts in the field, to present examples of good practice, but also to share their experiences and views on a specific topic/field. The cross-sectoral forum would support the implementation of the defined policy instruments by the sectoral committee by ensuring a continuous exchange of information and knowledge on current issues in forestry and related sectors, but also by providing space for the development of knowledge, projects, training, etc. Depending on the organizational solutions related to the establishment of a bridging organization (e.g., territorial organization, type and governance structure, etc.), the organization of cross-sectoral forums and the coordination of work may vary. The use of already established stakeholder networks at the regional and local level (regional development agency, local emergency departments, local self-government) or similar, is advisable given the potential lack of human and financial resources (Stanišić 2023). The proposed solution is based on examples of good practice from the Netherlands and Canada (van Wyk et al. 2007; Pearce et al. 2009) and on the attitudes of respondents (Stanišić 2023). In addition, the development of an interactive information system is proposed, i.e. internet platforms within the bridging organization. In this way, it would be possible, among other things, to inform the public about current and planned activities related to CC governance in a given region/municipality. In addition, all stakeholders involved could use the internet platform to provide information about their organization’s current and planned activities related to CC governance in a specific region or municipality. An example of good practice is the internet platform for the exchange of data and information on biodiversity, which is available to all stakeholders in Montenegro (2015).

The proposed solutions for improving policy instruments and collaboration are shown in Fig. 1.

In order to *improve the existing areas of collaboration*, it is proposed to involve representatives of the civil sector in the activities related to the work of the emergency management departments and divisions. The proposed solution is based on examples of best practices (Stefanović et al. 2015) as well as on the basis of respondents’ suggestions (Stanišić 2023). For the improvement of education and training, including the development and implementation of projects, a solution was proposed for the establishment of cross-sectoral forums and the planned organization of training, workshops, discussions and forums (a solution within the framework of informational policy instruments).

¹⁴The bridging organization has the role of coordinator in establishing contacts between stakeholders at all levels of governance in order to define and implement policy instruments for climate change governance through the exchange of information on challenges, needs, but also ongoing activities which are of common importance (Stanišić 2023).

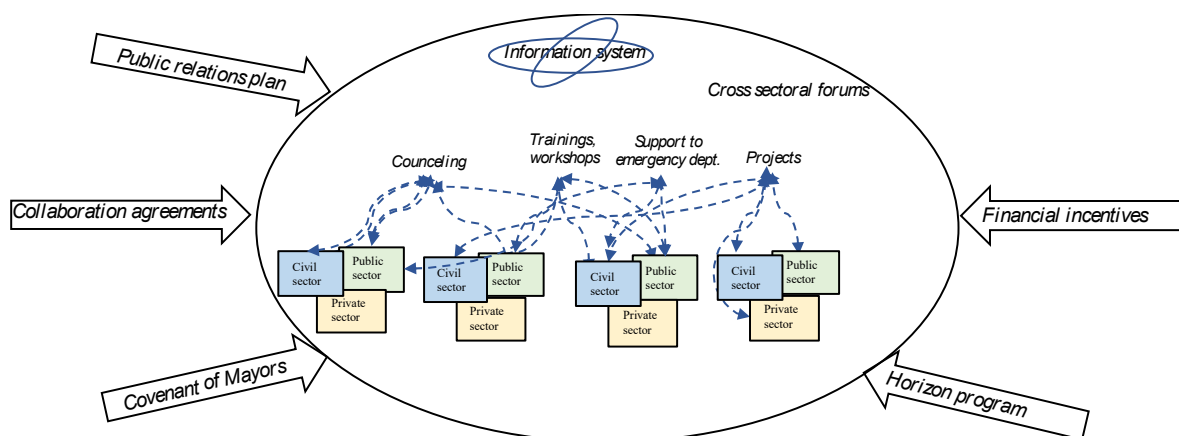


Fig. 1. Suggested solutions for improvement of policy instruments and collaboration. (Source: original).

The majority of respondents from the public and civil sectors (87%) are in favor of improving the dissemination of information and contacts between stakeholders. At the same time, it is emphasized that “the system of information exchange between the stakeholders of forestry and related sectors in the field of CC does not exist” (ŠU1). The public service representatives emphasize that information exchange and collaboration between sectors need to be improved (INC1, INC2, IF2) as, according to the PE respondents it is “...segmented and not clearly defined” (SŠD4) or “...in most cases not systematically solved” (VŠD). While the LS representative emphasizes that the approach to disseminating information and contacts is “...spontaneous, without a clear plan” (LSKU), the NGO representatives point out that “...there is no mechanism for information exchange” (NGO1) and that “...technical support is needed for establishing contacts and exchanging information between stakeholders” (NGO2).

A large number of respondents from the public and civil sectors are in favour of the proposed activities, including:

- the organization of cross-sectoral forums for the exchange of information, opinions and advice as required;
- the establishment of an interactive information system for the exchange of information on CC governance at local and regional level.

Some respondents from the state administration and PE take a neutral stance and believe that there is a lack of human and financial resources for the establishment of an interactive information system for the information exchange (DF2, SŠD4), as well as a lack of interest at the local level in the organization of cross-sectoral forums (DF2). However, the representatives of the state administration and public service point out that the advantage of this approach is “...to share information quickly and easily” (DF1), but that it also requires the involvement of various stakeholders (INC2). The respondent from PE notes that the information system offers the opportunity to “...disseminate relevant information (e.g., meteorological information, risk maps, etc.)” which is often not available to the general public (PENPD). The NGO representatives believe that this approach is necessary from the point of view of “...strengthening and expanding contacts at local level with various experts” (NGO1, NGO2).

5. Discussion

5.1. Support policy instruments for climate change governance

The analysis of policies and instruments for CC governance shows that the implementation of various policy instruments requires a functioning system for their implementation and monitoring, while institutional constraints (lack of adequate resources, technical capacity), but also the possibility of horizontal and vertical linkages with other organizations are only some of the perceived challenges (Gupta et al. 2007).

Previous research has found that there is a lack of *regulatory policy instruments* for developing partnerships or promoting other avenues and forms of collaboration between stakeholders (Berardo & Scholz 2010; Halušková et al. 2021). One of the reasons for the lack of these instruments that support collaboration between stakeholders from different sectors is the centralized governance system. Another reason could be the insufficient collaboration between different sectors at the same governance level in the implementation of these instruments (Li et al. 2013). Research highlights that centralized governance often undermines the establishment of sound multi-sectoral collaboration, especially in complex environmental management contexts (Mickwitz et al. 2009).

Previous research in Serbia has shown that regulatory policy instruments for CC governance are included in the LS programs and planning documents, which mainly deal with environmental protection issues, but are not specifically planned (Vranić 2018). In addition,

one of the reasons for the lack of regulatory policy instruments could be the long-time lag between the adoption of important strategic and legislative documents in the field of CC and their implementation through programs and plans (Mickwitz et al. 2009). This situation could partly explain why Serbia lacks regulatory policy instruments for the development of stakeholder collaboration, but also their participation in the development of local CC adaptation plans and programs, as is the case in Croatia (2020d). Furthermore, the existing strategic frameworks for forestry and related sectors in Serbia have not sufficiently recognized the role of lower level stakeholders in CC governance. The legal framework has not defined the need for their collaboration and therefore does not provide incentives for the development of the necessary policy instruments (Stanišić 2023).

In the context of the existence and application of *economic policy instruments*, especially direct financial incentives, it was observed that the state financed the rehabilitation of forest damage caused by ice breakage in the forests of eastern Serbia in 2014 (Baković et al. 2015). However, research in Slovenia emphasizes that financial incentives are needed not only from the state, but also from foreign funds, private companies and society as a whole to repair forest damage caused by natural disasters (Unay-Gailhard & Bojnec 2020). Previous studies have shown that the effectiveness of economic instruments such as subsidies, tax benefits and penalties is crucial for the application of multifunctional forest management (Sarvašová et al. 2014). There is a need to increase economic policy instruments for CC mitigation activities in Serbia (Lukinović et al. 2017; Milutinović 2018), as the availability of financial resources can influence the participation of the local community in these activities (Stefanović et al. 2015). In addition, the involvement of LS in the development of action plans for adaptation to changing climate conditions, as well as the development of collaboration between municipalities and with other stakeholders, requires the availability of more diverse sources of funding, such as the European Structural Funds (Milutinović 2018). This situation was also confirmed in this study.

Previous research on CC governance policy in the EU have shown that there are numerous *informational policy instruments*. These instruments aim to improve the decision-making process and solve the problem of CC by improving stakeholder knowledge and collaboration, increasing dialogue and using new technologies (digital platforms) to disseminate information on the issue (Rayner & Jordan 2016). Previous research has shown that the strategic and legal framework in Serbia provides a variety of informational policy instruments, including those related to stakeholder collaboration. These instruments are implemented through workshops, conferences, seminars, projects, etc. (Stanišić 2023). However, research on the capacities of local communities in the fight against CC has shown that “...there is

not enough knowledge and trained people to propose and implement complex projects, which results in few projects being implemented by the municipalities themselves” (Đorđević et al. 2016). It was also noted that in Serbia, at the national level of governance in forestry and nature conservation, “...there is no systematically organised reporting process between institutions in relation to CC” (Nonić et al. 2017). This situation can be partly explained by the lack of clear responsibilities of organisations at the lower levels in relation to CC governance (Stanišić et al. 2021).

5.2. Collaboration in climate change governance

Previous research on CC governance in forestry and related sectors in Serbia point to the important role of various stakeholders from the public (Nonić et al. 2017; Nedeljković et al. 2019), private (Nedeljković et al. 2020) and civil society sectors (Đorđević 2016; Nedeljković et al. 2020). However, the possibility has also been pointed out that certain stakeholders may be excluded from the decision-making process in governance if they occupy a marginal position in society, are located at lower levels, but also if there is no connection and collaboration (DiGregorio et al. 2019). This exclusion is exacerbated by limited participation mechanisms and inadequate institutional frameworks, as highlighted in a similar study on biodiversity governance in Central and Eastern Europe, which also emphasizes the need for decentralized, participatory governance models (Klůvanková-Oravská et al. 2009). According to the results of a study conducted in Serbia (Živojinović et al. 2015), the lack of connection between stakeholders from different sectors in natural resource governance can influence the decline in communication. The main challenge is the need for consistent collaboration between communities, governments and public organizations to align their goals and secure financial support (Sarvašová et al. 2014). To improve collaboration, the establishment of intermediary bodies that connect stakeholders from different levels of governance is crucial. A cross-sectoral forum, as proposed by Fazey et al. (2017), could serve as a platform for stakeholder interaction, knowledge sharing, and joint decision-making on climate governance. Such a forum would provide a space for learning, knowledge development, training and consultation of stakeholders at the regional and local governance level on CC (Stanišić 2023).

The frequency of collaboration and contact between stakeholders in flood risk management at the regional level is one of the important factors that, in combination with the geographical location (distance) between these parties, has a major impact on implementation (Thaler et al. 2016). In addition, stakeholder collaboration in governance of natural resources under CC conditions may vary depending on whether there is an established

mechanism or system of interaction (Nonić et al. 2017). Therefore, the need to strengthen the role of the local community and NGOs in the fight against natural disasters is emphasized (Stefanović et al. 2015).

A study on CC adaptation points out that “...knowledge and capacity to adapt to CC is inadequate in terms of predicting, responding to and assessing the impacts of planned activities, actions and policies at the national level” (Smit et al. 2001). Research dealing with CC adaptation at the local level has found that one of the main challenges for stakeholders in developing local action plans for CC governance is the lack of knowledge, recognition of the importance and local risks and instruments for CC governance (Mees et al. 2018). Furthermore, the same authors found that access to stakeholders knowledgeable and committed to this topic is difficult due to a lack of contacts or, when information is needed, it is not known where to find it, if it exists (Mees et al. 2018). Similar situations were observed in this study, where respondents felt that there was a lack of information sharing systems at local and regional governance level, as well as a lack of educational activities on CC governance. Improved access to educational programs and workshops, as suggested by Mees et al (2012), could close these gaps and improve stakeholder engagement in climate governance efforts.

6. Conclusions

The following solutions related to the improvement of regulatory, economic and informational policy instruments have been identified:

- Regulatory: improve policy instruments for the development of collaboration between stakeholders from all 3 sectors in the governance of CC. This includes the integration of mechanisms for regular dialog and partnerships, such as memorandums of understanding or intersectoral agreements, to formalize collaboration and accountability;
- Economic: improve various financial incentives for increased stakeholder collaboration. Introducing diversified funding sources, such as public-private partnerships, international grants, and community-driven initiatives, could help create a more sustainable financial ecosystem for CC governance. In addition, targeted funding should prioritize under-resourced municipalities to ensure equitable participation;
- Informational: improve policy instruments for sharing information on existing initiatives and activities between stakeholders and their training. This could include the creation of centralized digital platforms for real-time sharing of best practices, case studies and local solutions to increase transparency and efficiency of information dissemination.

The majority of public and civil sector representatives believe that regulatory policy instruments related to the development of collaboration between stakeholders from

all 3 sectors in CC governance need to be improved. The majority of public sector representatives and all civil sector representatives have a positive attitude towards the need and possibilities of defining and implementing different types of agreements with the aim of developing collaboration between LS, PE for state forest management and educational organizations, cross-network organizations and local NGOs. It was emphasized that the creation of clear operational frameworks and public-private partnerships is essential for a more robust collaboration. They also believe that it is necessary to create a public relations plan for the forestry sector and related sectors. This plan should emphasize the role of forests in climate resilience and use modern media channels to raise public awareness and engage stakeholders.

All representatives of civil society representatives and the most representatives of the public sector, believe that economic policy instruments need to be improved through a greater variety of financial incentives in order to improve collaboration between stakeholders. The development of action plans to adapt to changing climate conditions must be supported by the Horizon and LIFE programs, and it is proposed that municipalities with sufficient human capacity be selected for such programs to implement these instruments. To ensure inclusivity, efforts should be made to provide technical assistance and capacity-building initiatives for less experienced municipalities to qualify for these programs. It was suggested that the conditions for the use of policy instruments for the maintenance and protection of forests from natural disasters should be changed to allow owners of private forests to use them. This flexibility is crucial for extending efforts to strengthen resilience to all forested areas, regardless of ownership. It is advisable to take a look at the economic policy instruments that will be available to private sector in the future.

The use of informational policy instruments to support education and dissemination of information on this subject is also proposed. The majority of representatives of the public and civil sectors confirm the need to improve policy instruments for the exchange of information on current initiatives and activities at the local level through Internet platforms of parent organizations and bridging organizations. Regarding the improvement of training, respondents are positive about the planned organization of trainings, workshops, discussions and forums in collaboration with educational and research institutions according to the defined needs of stakeholders in forestry and related sectors. These efforts should also include practical exercises and simulations under real conditions to strengthen the resilience and adaptability of stakeholders. They believe that a higher level of knowledge would mean greater motivation for employees. Establishing a recognition system or certification for trained stakeholders could provide a further incentive for participation and engagement. The involvement of stakeholders from the regional and local governance

level in the definition and development of projects is also necessary to, among other things, increase the contribution to the fight against CC and enable the exchange and improvement of knowledge between stakeholders at lower levels of governance. Empowering local governance structures through decentralized decision-making and resource allocation is also recommended.

To enhance collaboration between stakeholders in forestry and related sectors in addressing CC, solutions have been defined to support: 1) the dissemination of information and contacts between stakeholders and 2) the strengthening of existing forms of cooperation. The majority of public and civil sector representatives believe that the establishment of cross-sectoral forums is necessary to create the conditions for better dissemination of information and contacts between stakeholders by organizing workshops and offering consultations according to local needs. Additionally, the use of digital collaboration tools such as cloud-based platforms for joint decision-making and project tracking could further improve coordination. Furthermore, it is proposed to use an information system for sharing information relevant for all sectors, e.g., risk maps for floods, landslides, erosion, meteorological information, etc. All respondents were positive about *improving existing areas of collaboration*, and recognized the need to involve civil sector representatives in the work of emergency management departments and divisions. To make these contributions more effective, clear guidelines on the roles and responsibilities of civil sector representatives in emergency response should be established. All respondents also believe that the training and education of those involved needs to be improved and that this process should be planned.

When considering the proposed solutions, financial investment and sufficient competent staff would have to be ensured. It would therefore be important to examine existing organizational structures (regional development agencies, public agency or similar) to facilitate the development of links between stakeholders across sectors and governance levels. In addition, it would be important to consider not only the timely application and appropriate intensity in the implementation of the proposed policy instruments, but also to create an effective and efficient mix of instruments tailored to the needs of different stakeholders.

There are limiting aspects of this research that should be considered. The research area covered selected forest regions and national parks and did not include representatives of the private sector of forestry and related sectors. Therefore, this study defines to some extent improvement in policy instruments and collaboration, although the solutions remain somewhat nuanced in detail, highlighting a greater need for alignment with EU strategic documents.

Expanding the scope of the research to include a broader range of organizations, selecting respondents from all relevant sectors and engaging public opinion can

improve the understanding of stakeholders' needs in relation to CC governance issues. Tailored solutions should be developed to combine appropriate policy instruments and strengthen stakeholder collaboration in forestry and related sectors in Serbia that are compatible with the principles of multi-level governance.

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